

Identifying Problems Associated with Studying of Chemistry in Anambra State, Nigeria

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Abstract- The study identifies various problems associated with studying of chemistry in Anambra State, Nigeria. A questionnaire was distributed to secondary schools students and undergraduates in the department of Chemistry, Nwafor Orizu College of Education Nsugbe, Anambra State and Anambra State University Igbaram curriculum, Anambra State. Thirty secondary schools were selected which were in the same education zones of the higher institutions. Hundred and fifty students were selected from secondary schools and hundred chemistry students were selected from the higher institutions. Most of the challenges are from the infrastructure, curriculum, funding, textbooks, teachers, students. Some recommendations were made.

I. INTRODUCTION

The word Chemistry usually bring up a mental picture of the many synthetic substances that we see around us. We may think of dyes, plastics, fibres and drugs are manufactured by chemical processes. The study of these processes would not answer the question. Each new discovery in the field of chemistry depends upon either discourages, sometimes in other fields such as physics and biology. During the science subjects, what then sets chemistry apart from physics and biology? It is still convenient, to associate chemistry primarily with the study of matter – its composition, the changes is undergoes, and the energy exchanges involved in these charges.

Probably, the best way to seek an answer to the question is to trace the development of some particular chemical discovery. Chemistry is the study of the properties and composition of matter and the changes with matter undergoes. It is far more than that. We shall see it as concern with the energy exchanges that accompany all changes in matter. Chemical knowledge derived from this study is based on experiments in which very careful observations are made usually a particular question.

A chemist is always on the workout for a regular pattern of behavior. The more scientist seek answers to their questions, the more they realize that absolute answers are rarely if ever.

Chemistry as a course of study is perceived generally to be very interesting, vast mathematical and experimental. Almost all aspect of life science, both living and non-living has something to do with chemistry ranging from Physical to Biological sciences. Chemistry is one of the pre-requisite subjects for the study of engineering, technological, medical and other applied science courses in the university.

Chemistry is the study of laws of nature that govern the behavior of the universe, from the very smallest scales of sub-

atomic particles to the very largest scales of cosmology. Chemistry is becoming increasingly interdisciplinary, as chemistry work with engineers, physics and biologists in order to understand and solve a wide range of problems confronting society.

Chemistry is a challenging and rewarding subject. Its study instructs a person in the art of critical thinking, how to pose questions and how to solve problems. It also equips graduates with process skills.

Chemistry is at the heart of almost every facet of modern life. Chemistry provides training for a vast range of careers. Consequently a vast range of career options are available, options which might not directly use chemistry. Chemistry faces the world with confidence and knows where to obtain the information they need to complete a task. Hence, Ababio (2013) enumerated some careers in chemistry such as teaching service, health service, food processing, petroleum and photochemical seminars, manufacturing industry, extractive industry, Agriculture and Forestry.

There are many problems associated with the study of chemistry. Tarrant (1981) had already indicated that environmental factors affect remembering. For example, it is very difficult to learn efficiently if your attention is distracted or worries affect your concentration or circumstances prevent practice and revision. Ogunsaju (1981) made it clear that in most cases a school will jump into the teaching of various inter-related sciences without either having concrete objectives in mind or knowing how to achieve their stated objectives. The pressure becomes more complicated by lack of manpower and finance to purchase science equipments. This has made it difficult for secondary schools in Nigeria to have effective science programmes.

Ndu (1991) discovered that the most important problems of teaching and learning science in the rule environment are inadequate equipment to science teachers, inadequate equipment to science teachers, inadequate facilities for students to study at home and insufficient number of science laboratories.

Furthermore, Alonge (1981) made it clear that suitable materials and local material are not available in schools and the few available ones are not in the recent textbooks. Chemistry is thus employed in an extensive range of activities, both within and outside the discipline itself. If these aims are not met in the little available existing time, the challenge faced as a result of these obstacle need to be tacked. The aim of this study is to identify problems associated with studying of chemistry in Anambra State Nigeria.

II. AREA OF STUDY

This study covers the entire Anambra State. The State has one College of Education and one University with many senior secondary schools. The Nwafor Orizu College of Education, Nsugbe and Anambra State University Igbariam campus are situated in Otuocha zone of Anambra State, Nigeria, and the selected secondary schools for the research are in Otuocha Education zone in Anambra State.

Statement of the problem

Chemistry is a subject that requires continuous practice, especially now it is getting across the boundary line among other subjects such as physics and biology. The discoveries in chemistry is endless and the channels involve need to research in a conducive environment.

The rate at which students are dropping the chemistry shows that there is a problem. The problem associated with the study of chemistry are numerous, hence it is necessary to identify these problems and suggest possible ways it can be solved.

Purpose of the Study.

The purpose of the include

1. To identify the problems associated with study of chemistry in secondary schools.
2. To identify the problems associated with studying of chemistry in higher institutions
3. Compare the problems associated with the study of chemistry in secondary schools and higher institutions.

POPULATION OF THE STUDY

The population for the research consists of all the second and third year senior secondary school students in secondary schools in Otuocha Education zone Anambra State, and the undergraduates' students in Department of Chemistry, school of sciences of Nwafor Orizu College of Education Nsugbe, Anambra State and in Anambra State University, Igbariam campus.

VALIDATION OF THE INSTRUMENT.

To ensure the validity of the instrument, the instrument was submitted to experts in measurement and evaluations Federal College of Technical Education Umunze. The lectures subjected the item to their expert scrutiny on the basis of which the researchers made modification that saw the instrument on its present form.

RELIABILITY OF THE INSTRUMENT.

The reliabilities instrument was tested using test-retest method. Using schools in Aguata zone with lecturers from Federal College of Technical Education Umunze Education Umunze and federal Polythenic Oko, Anambra State. To

ascertain the internal reliability of the instrument, Perason product moment correlation coefficient was found to be 0.78.

SAMPLE SIZE

The researchers used simple random sample without replacement to select 150 chemistry students in Otuocha Education zone in their senior secondary schools and 100 chemistry students from Nwafor Orizu College of Education Nsugbe and Anambra State University, Igbariam Campus.

METHOD OF DATA COLLECTION.

The researcher used on the sport inter –personal method of administration. Each of the respondents was given a copy of questionnaire to complete, and thereafter all the questionnaires were collected back.

INSTRUMENT FOR DATA COLLECTION

Structured questionnaire which addressed the problems associated with studying chemistry in schools where used. The questionnaire has three sections; Section A covered personal data, of the respondents, while section B covered problems associated with studying chemistry in schools and C covered solution to the problems. The items will cover Yes or No response.

RESEARCH QUESTIONS

The following research questions are in the course of carrying out this work.

1. What are the problems associated with the studying of chemistry in secondary schools of Anambra State?
2. What are the problems associated with the studying of chemistry in higher institution?
3. What are the possible solutions to the problem associated with the study of chemistry in schools?

RESEARCH DESIGN

This study adopted a descriptive design. A survey research is one which a group of people or items are studied by collecting and analyzing data from only a few people or items considered being representative of the entire group.

METHOD OF DATA ANALYSIS

Percentage was used to analysis the result which was used to answer the research questions.

Research Question 1: What are the problems associated with the studying of chemistry in secondary schools of Anambra State?

The research question 1 is answered in table 1.

Table 1: Problems associated with studying of chemistry in secondary school.

A	Problem of Infrastructure	Yes %	No %
1	There is inadequate classrooms in schools	70	30
2	The schools lack laboratory	80	20
3	There is no enough equipment for teaching and learning chemistry.	90	10
4	The environment is not conducive for learning.	85	15
5	There is poor power supply	95	05

6	The school lack water	90	10
	Mean	85	15
B	Problem from the curriculum		
7	The school curriculum is not stable	20	80
8	The syllabus is over loaded	85	15
9	The chemistry subject does not inspire the students.	75	25
10	ICT is not involve in studying of chemistry	84	16
11	The chemistry curriculum does not engage the students to do practical work	64	36
12	Time for studying chemistry is not enough	58	42
	Mean	65	35
C	Problem of Funding		
13	There is poor funding of chemistry subject in schools	72	28
14	Many school heads are not paying attention to the study of chemistry.	69	31
15	The students of chemistry require special allowance for the course.	55	45
16	Due to the risks taken in studying chemistry, the students suppose to study with scholarship.	84	16
	Mean	70	30
D	Problem of Textbooks		
17	The chemistry textbooks are too costly	77	23
18	There are few chemistry textbooks in the market.	66	34
19	The chemistry textbooks are too old to be used now	42	58
20	There is no chemistry library in schools	20	80
	Mean	52	48
E	Problem from the Teachers		
21	There is lack of qualified chemistry teacher in schools	73	27
22	There is no chemistry laboratory assistant in schools.	88	12
23	There is no chemistry laboratory attendant in the school.	88	12
24	The chemistry teachers lack experience	23	77
25	The chemistry teachers are not happy with their job	63	37
26	There is no incentive for chemistry teachers in schools.	74	26
	Mean	69	31
F	Problem from the Students.		
27	The peer group affect the students negatively	54	46
28	The parents are forcing the students to study chemistry.	44	56
29	The students' future career has no link with the study of chemistry.	64	36
30	The students hate the chemistry teacher.	60	40
	Mean	56	44

From table 1, it shows that the problems associated with study of chemistry in secondary school include: problem of infrastructure 85%, curriculum 65%, funding 70%, Textbooks 52%, teachers 69% and students 56%.

Research Question 2: What are the problems associated with the studying of chemistry in higher institutions.
The research question 2 is answered in table 2.

Table 2: Problems associated with studying of chemistry in higher institution.

A	Problem of Infrastructure	Yes%	No%
1	There is inadequate classrooms in schools	40	60
2	The schools lack laboratory	26	74
3	There is no enough equipment for teaching and learning chemistry.	32	68
4	The environment is not conducive for learning.	05	95
5	There is poor power supply	42	58
6	The school lack water	38	62
	Mean	31	69
B	Problem from the curriculum		
7	The school curriculum is not stable	30	70
8	The syllabus is over loaded	60	40
9	The chemistry subject does not inspire the students.	62	38
10	ICT is not involved in studying of chemistry	92	08
11	The chemistry curriculum does not engage the students to do practical work	72	28
12	Term/session is too short to cover the scheme	63	27
	Mean	64	36
C	Problem of Funding		
13	There is poor funding of chemistry subject in schools	83	17
14	Head of school does not encourage the students and staff in studying of chemistry.	86	14
15	The students of chemistry require special allowance for the course.	96	04
16	Due to the risks taken in studying chemistry, the students suppose to study with scholarship.	95	05
	Mean	68	32
D	Problem of Textbooks		
17	The chemistry textbooks are too costly	82	28
18	There are few chemistry textbooks in the market.	73	27
19	The chemistry textbooks are too old to be used now	34	66
20	There is no chemistry library in schools	82	28
	Mean	68	32
E	Problem from the Teachers		
21	There is lack of qualified chemistry teacher in schools	98	02
22	There is no chemistry laboratory assistant in schools.	04	96
23	There is no chemistry laboratory attendant in the school.	03	97
24	The chemistry teachers lack experience	13	87
25	The chemistry teachers are not happy with their job	56	44
26	There is no incentive for chemistry teachers in schools.	96	04
	Mean	45	55
F	Problem from the Students.		
27	The peer group affect the students negatively	58	42
28	The parents are forcing the students to study chemistry.	12	88
29	The students' future career has no link with the study of chemistry.	02	98
30	The students hate the chemistry teacher.	13	87
	Mean	22	78

From table 2, it shows that the problems associated with the study of chemistry in higher institutions include:- curriculum 64%, funding 66%, and textbooks 68%.

Research Question 3: What are the possible solutions to the problems associated with the study of chemistry in schools?
The research question 3 is answered in table 3.

Table 3: solutions to the problems associated with the study of chemistry in schools.

A	Solution to the problem of infrastructure	Yes%	No%
1	More classrooms are needed in schools	58	42
2	Enough equipment is needed in schools	90	10
3	Teachers should improve where the equipment is not there	95	05
4	There should be constant power supply	98	02
5	Water should be supplied in schools	95	05
	Mean	88	22
B	Solution to the problem o curriculum		
6	The policy makers should provide stable curriculum	52	48
7	The syllabus should not be over loaded	56	44
8	The chemistry subjects should inspire the students	70	30
9	The ICT usage should be incorporated into the chemistry curriculum	80	20
	Mean	65	35
C	Solution to the problem of funding		
10	More money should be provided for the study of chemistry	40	70
11	Government should support the school in funding chemistry subject	80	20
12	Special ward should be given to students of chemistry.	90	10
	Mean	70	30
D	Solution to the problem of textbooks		
13	The government should subside the cost of textbooks	85	15
14	More authors should be encouraged to write more textbooks	30	20
15	Standard library should be build in schools	60	40
	Mean	59	41
E	Solution to the problem of teachers		
16	Qualified teachers should be employed in schools	70	50
17	Chemistry laboratory assistant should be employed in schools	80	20
18	Chemistry laboratory attendant should be employed in schools	50	20
19	More incentives will be given to chemistry teachers	65	35
20	Chemistry teachers should be encouraged to attend in-science training	75	15
	Mean	68	32
F	Solution to the problem from the students		
21	The Guidance Counselor should held to counsel the students	90	10
22	The students should be advised to do chemistry	95	35
	Mean	93	07

From table 3, it shows the solution to the problems associated with the study of chemistry in schools cover infrastructure curriculum, funding, textbooks, teachers and students.

Summary of the work:- This is summarized as follows

A. The problems associated with the study of chemistry in secondary schools include:-

- Infrastructure: The schools have inadequate classroom, they lack laboratory, there is no enough equipment, the

environment is not conducive, there is poor power supply and no water.

- Curriculum:- The school curriculum is not stable, the syllabus is overloaded, the scheme does not inspire the students, ICT is not involved in the studying of chemistry, students are not engaged in practical work.
- Term / session is too short to cover the scheme.
- Funding:- There is poor funding of chemistry in schools, head of schools does not incentive given to students or teachers of chemistry.
- Textbooks:- The availability textbooks are too costly to purchase, the chemistry textbooks in the market are few. The old chemistry textbooks are many and there is no chemistry library in schools.
- Teachers:- There are few qualified chemistry teachers in school, no laboratory assistant and attendant, the staff are not happy.
- Students:- Peer group affect the students in doing chemistry, the students are studying chemistry under pressure from their parents, the students future career has no link with chemistry and the students hate their teachers.

B. The problems associated with the studying of chemistry in higher institutions include:-

- Curriculum:- The syllabus or scheme is over load, the subject does not inspire the students Non implementation of ICT in chemistry teaching and learning, and the curriculum does not engage the students to do more exercises.
- Funding:- The department experience poor funding, the head of the institution are not paying attention to the department, the incentives to the staff and students.
- Textbooks:- The chemistry textbooks are too costly, and only few chemistry textbooks are available in the market.
- Teacher:- The chemistry personnel are not happy with their work and there is no incentive for them.
- Students:- The peer group are affecting the students.

C. Solution to the problems. The solution include:-

- Infrastructure:- More infrastructure should be provided.
- Curriculum:- The curriculum should be stable and the use of ICT be introduced in studying chemistry.
- Funding:- The government and head of institutions should supervisor the chemistry department more.
- Textbooks: The chemistry authors should be encouraged to write more. Library will be provided and government should subside the cost o textbooks in schools.
- Teachers:- Qualified teachers should be employed in schools. More incentives should be given to the teachers.
- Students:- The students should be encouraged to study chemistry through given them allowance.

III. CONCLUSION

I believe that attracting more students into the study of chemistry requires action at all levels: school, university,

industry, government and the learned societies. Also implementing most of the recommendations will serve as a aid in solving most of the challenges face by the students in secondary and higher institution. Chemistry is a powerful tool for dealing with the present. It drives economic growth. It creates our options for the future. It is the key to our global competitiveness.

IV. RECOMMENDATIONS

- Laboratories should be furnished with necessary equipments for practical and research work.
- Provision of generator for supply of electricity.
- prompt release of academic results, students should be notify of their examination results at the end of each semester.
- A well structured building to contain lecturers and equipments. There will be an upgrading of equipments by replacing worn outs and buying of new modern equipment.
- There should be an introduction of student industrial working experience scheme; this will broaden the knowledge and widening the scope of their learning.
- Provision of level coordinator and counseling unit in the department.
- Seminar on crucial topics and academics standing of all students should be done.
- The Teachers/Lecturers and student should have cordial relationship between them.
- Chemistry practical should be conducted along with teaching theory.
- A bursary scheme should be available to undergraduates studies chemistry level is relevant to the employment opportunities of the future – a science degree should develop the core skills, such as communication and the ability to work as part of larger team, that graduates will need whatever they go on to do.
- Yet it is clear that an inspiring teacher engaged with and motivated by their subject, is the springboard for many pupils' future choices. There should be a teacher training for chemistry graduates.
- Increase the attractiveness of career in chemistry teaching. For chemistry teachers to remain both inspired and inspiring they need to be given the support and opportunity to remain up to date.
- Developing student's interest and curiosity in chemistry by merely teaching them facts. We need to make chemistry relevant to their lives. One way of doing this, is talking about recent scientific developments and tracing these back to scientific principles and historical discoveries.
- Also chemistry could be taught through 'explanatory stories' which not only attach a contemporary relevance to teachings, but also place them within a historical and cultural context.
- There should be an online chemistry tutorial written for secondary school chemistry students.
- Teaching facilities are modern and interaction between student and teacher encouraged.

- Teaching should encompass a combination of lectures, accompanied by multimedia and practical demonstrations, tutorials and a range of laboratories.
- The school should be well equipped with computing facilities, and all chemistry undergraduates are given their own accounts, with full access to e-library.
- A number of schools of science scholarships should be available for students. The school also offers prizes at the end of each year for the best performance in various undergraduate Chemistry courses.
- Vacation Scholarships must be available for students who wish to spend some of their vacations gaining research experience.

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