AWARENESS, FAMILARITY AND USABILITY OF CHEMISTRY CONCEPTS AMONG JUNIOR SECONDARY SCHOOL STUDENTS IN MINNA METROPOLIS

BY

AMINU, Maimuna Paiko

2016/3/64466BE

SUBMITTED TO

THE DEPARTMENT OF SCIENCE EDUCATION,

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ABSTRACT

The aim of this study is to find out the awareness, familiarity and usability of chemistry concept among junior secondary school in Minna metropolis Niger state. The study adopted a descriptive cross-sectional survey design. The population of the study is 600 junior secondary school (JSS3) students and simple random sampling technique was used to select 60 Junior Secondary School (JSS3) students. Three research questions were raised. Awareness, familiarity and usability of chemistry concept questionnaire were used for data collection and administer to 60 Junior Secondary School (JSS3) students in the selected junior secondary schools in Minna metropolis, the reliability of the instrument was determined using the result from the pilot study and cronbach alpha formula yielded a reliability coefficient of 0.76-0.83. The data collected were analyzed using the Mean and standard deviation was used to analyze data. The findings of the study revealed that student at junior secondary school are not aware of chemistry concept, the result of familiarity shows negative response and the usage of chemistry concept also showed negative response. It was recommended among others Government should provide enough funds for schools and also provide special allowance for science teachers as to encourage them in use of instructional materials in teaching.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

Science and chemistry education in particular is a veritable instrument for national development. According to Amendu, (2014) science is a way of seeking information (process) and also an accumulated knowledge resulting from research (products). Okoro, (2013) sees science as a systematic investigation of nature with a view to understudy and harnessing them to serve human needs. Science may be regarded as the body of related courses concerned with knowledge. It consists among other component; Chemistry, Physics, Biology, Mathematics, Astronomy, Agriculture, among these, chemistry is vigorously described as the queen of science. Realizing the role science plays in achieving self-reliance and intellectual development, one tries to find the place of chemistry in science. Notwithstanding the negative role chemistry education does play globally, such as pollution and drug abuse, the positive roles are well known. The alarming rate of poor performance in science subjects coupled with the low educational standard in the country are parts of the major reasons why most students shy away from the study of science. This negative attitude has encouraged poor performance and low participation of students in the higher science subjects like physics, chemistry and biology. All these problems mentioned above have been conclusively blamed on basic science and its teaching.

Basic science serves as foundation for meaningful understanding of advanced scientific theories and principles because the bulk of content of the basic science curricular is descriptive, where the student is meant to learn many basic concepts like energy, matter, force and measurement. Previous studies have revealed that science teaching has been facing problems from different

angles ranging from the learner, the teacher, the school, the government and even the parents (Okoro, 2013).

Chemistry is the central in the drive of global sustainable economic development. It plays the major roles in food (fertilizers and insecticides), clothing (textile fibers), housing (cement, concrete, steel, bricks), Medicine (drugs), Transportation (fuel, alloy materials). Presently, man is experiencing an era in scientific and technological development that affects his life in one way or the other. Virtually everything we use daily involves science.

According to the curriculum of science teaching, there are several science lessons taught in secondary school. One of them was chemistry. Chemistry is an important subject; it discusses the composition and structure of things around us. Yet, chemistry often described as an unpopular subject among the students (Hofstein, Eilks, & Bybee, 2011). Most of students in secondary school think that chemistry is difficult (Ali, 2012), it is also not interesting and important (Broman, Ekborg & Johnels, 2010). Several researches have shown the source of students' difficulties to learn chemistry was the abstract concepts of chemistry (Inas, Sulistyo and Nurma, 2018) inappropriate and irrelevant instructions with the real world situations (Aikenhead, 2003) and chemistry is supposed to have difficult scientific terminology (Woldeamanuel, Ategana & Engida, 2014).

The difficulty of learning chemistry makes students have low positive perception on chemistry (Kubiatko & Eurasia 2015). The study showed the students have the low level of interest and motivation in learning science because they have less knowledge about the relevance of learning about science to their life (Jekins & Nelson, 2005). Students' familiarity influences their interest, the way they treat to subject and their expectations. Bad perception can influence the students' approaches toward their subject. The students' perceptions were linked closely with their

expectations (Tudor, Penlington and Mcdowell, 2010) about their engagement with their learning in favor of deep approaches to learning. Other research concluded how student's interpreted and experience courses were important (Ellis, Goodyear, Calvo & Prosser, 2008). If the students consider the learning in the class was badly implemented, overloaded with homework, and no relevance with their life, they just to approach it in the surface rather than in the deep of the content. The first students' impression can influence their interpretation of the future event, they consistently memorize the information of their first believes (Inas, Sulistyo & Nurma, 2018). Chemistry is first introduced and taught to students in junior high school. In seventh grade, students learn about the classification of matter and its changes. Students were introduced to several new chemical terms, the element symbols, and visualization of atoms and molecules. According to Inas, Sulistyo and Nurma (2018) stated, there were three levels of science considered as one of the concepts mapping of the closed-cluster chemistry which is centrally important. They were related to and support each other.

Students have opportunity to familiarize themselves with the content of basic scientific facts, concepts such as (item, substance, reaction, cell, organism, energy) that are specified by the study of individual representatives of chemical, biological objects, physical, and chemical about the construction of building particles of inanimate and animate nature and scientific laws that aims the understanding of nature.

According to the 21st-century skills disclose about the global awareness, consequently, there are two focuses on the global awareness, the following are aware of the significance of scientific ideas and awareness of the significance of socio-scientific issues and problems.

The encouraging finding for those who teach international studies is that the entering students who pursue this major desire to enhance their global perspective. Our findings affirm the point

that the potential for fulfilling the crucial goal of promoting global awareness is great (De Soto, 2016).

Consequently, there is a relation about the chemical literacy and global awareness. Sine qua non, developing the global awareness can be done through chemical literacy. Students should be helped to develop an awareness of being part of an issue/problem, and thus develop a sense of relationship with the natural world concept as known as chemical literacy. Given that local issues and problems can have some personal significance, starting from students‟ locality and helping them become aware that they are themselves part of certain issues and problems. It can be a good strategy to promote global awareness to students. This study stressed the developing global awareness to the students by giving them a learning process through chemical literacy for instance, by using a problem-based learning model or involving the chemical literacy on the pencil-paper test.

The environmental issues, such as ozone depletion, greenhouse effect, and acid rain, become more popular not only in chemistry. The environmental issues existing in the world mostly involve the chemistry as the reason why it happens. These environmental issues also involve many concepts of chemistry and other science concepts. Developing the awareness of the significance of science ideas like environmental issues to the student can be done by giving the student environmental issues existing in the daily life and lets the students speak their argument and solutions up.

Training in natural sciences still dominates “receiving of knowledge,” which proved ineffective approach in the teaching process. Use of interactive teaching methods and modern information technology is limited. Our observations in the practice of teaching natural science, discussions with teachers and students show that most teachers do not understand the meaning of the term

"scientific literacy." Many of them connect it with scientific awareness and competence. This explains insufficient awareness of teacher for science literacy, which is a target to be formed.

We suggest the following example for a task which requires analysis of information and interpretation of evidence from the world around us for a formation of scientific findings.

Chemistry has an approach to building students' idea through material building (Merritt, Krajacik and Shwartz, 2008).

The process of chemical transformation involves intra-chemical reactions within the same substances such as, sublimation, radio-active decay like uranium, plutonium etc and other chemical reactions when the substances react with other things which includes the evaporation of volatile substances like fuel, Mentholated spirit and even water when exposed to air. Really, chemistry can be used to find solution to problems of everyday activates in science, industry, technology, government, educational sector and economics. Some of the industries that obviously cannot do without chemistry include; cosmetics industry, brewery industry, chemical industry, textile industry, food processing and technology industry, forestry, Agricultural industry, petroleum, pharmaceutical industry etc. Man's success in the different realm of chemistry provides ones unquenchable source of hope for success in technology. Whatever technology is, be it monster, man is poised to face it challenges having gained courage, built in confidence in himself as he overcomes the seemingly impenetrable mysteries of chemistry. To be able to operate machinery involved in technology, good dosage of simple experimental concept like observation and recording, theory and principles and measurement to take record of events that are needed. Also market forces succumb to the supremacy of social chemistry which includes simple experiment formulation such as record and observation, profit and loss, minimum and maximum, to the more complex ones like optimization theory and also operation

research such experimental expressions. Development is the gradual growth of something so that it becomes bigger, more advanced and stronger (Hornby, 2010). Mohammed and Bello (2013) sees development as growing or becoming industrialized. National development is the ability of a country or countries to improve the social welfare of the people. The question is whether this could be done through the knowledge of chemistry education? Educational institutions everywhere are established to carry out the role of teaching, research and community services, thereby contributing meaningfully to the social, economic, cultural, political, scientific and technological development of any nation (Iji, Abch & Uka, 2013).

This research was conducted as the first investigation toward the junior high school students' perceptions. The better understanding of students' perception toward chemistry learning enables teachers to design class activities and learning strategies which promote a meaningful learning.

1.2 Statement of the Problem

Chemistry is a vital school subject which deals with how matter interacts. In Nigeria, chemistry is usually introduced as Basic science at the Junior Secondary School level and as a core science subject in senior secondary school one (1) and it is expected that the students would continue to offer the subject until their final year. Reviewed literatures in science education have revealed that the various instructional methods that have been used in teaching practical chemistry have not improved students' academic performance in the subject to any significant extent. This connotes that the most desired scientific and technological knowledge that should be derived from practical chemistry for solving societal problems may not be sustained. Several factors are responsible for students' poor performance in chemistry as reported by (Eze and Nwafor, 2012, Oladejo, Ojebisi, Olusunde and Isola, 2011) these include lack and non-availability of practical apparatus, poor method of teaching, lack of science laboratory. The implication of this is that the

teaching of practical chemistry does not result in the learners' understanding of concepts. Attitudes to practical chemistry contents (acids and bases) are very poor and are impeding the desired growth of science and Technology that involves and revolve around chemistry. There is paucity of work done on the attitude of students to chemistry at the introductory level. This study investigated the awareness, familiarity and Usability of Chemistry Concepts among Junior Secondary School Students in Minna metropolis.

1.3 Aim and Objectives of the Study

The aim of this study is to examine the awareness, familiarity and usability of Chemistry concepts among Junior Secondary School Students in Minna metropolis. The specific objectives of the study include:

1) To find out the extent students awareness of Chemistry concept among Junior Secondary School
2) To find out the extent of student familiarity to the use of Chemistry concept at Junior Secondary School.
3) To find out the extent of student usage of chemistry concept at Junior Secondary School.

1.4 Research Questions

1. What is the level of student's awareness of Chemistry concept among junior secondary school?
2. What is the extent of student familiarity to the use of chemistry concepts in teaching among Junior Secondary School?
3. What is extent of student usage of chemistry concept among Junior Secondary School?

1.5 Scope of the Study

The scope of this study is limited in investigating the awareness, familiarity and usability of Chemistry concept among Junior Secondary School Students. The study is limited to the sampled Schools in Minna metropolis Niger State. The content scope of the study is restricted to Junior Secondary School Student (JSS 3). The study lasted for thee (3) weeks.

1.6 Significance of the Study:

The significance of the study can be overestimated more so as it concerned with awareness, familiarity and usability of Chemistry concept among Junior Secondary School Student in Minna Niger State. The study will certainly help the teachers, curriculum planners, the government and society at large. The finding will not only help in modifying the method of teaching chemistry but also help to eliminate or reduce some of the problem encountered by the students during the period of teaching and learning of this subject. this result will help the curriculum planners to understand the changes that will be necessary to improve the interest of Junior Secondary Chemistry students in Minna metropolis.

The study may go a long way to modify the attitude of teacher's towards student in chemistry class. The result of this study will enable the teacher's and other people concerned with curriculum planning to have first-hand information about student attitude in the area under study. On the part of the future researcher's the finding of this study will forms bedrock or at last provide a clue for further study.

CHAPTER TWO

2.0 REVIEW OF RELATED LITERATURE

2.1 Concept of Chemistry Education

Chemistry is a popular subject among senior secondary school students in Nigeria due to its nature. It addresses the needs of majority through its relevance and functionality in content, practice and application. What many nations like Nigeria need now is a functional chemistry education that will assist in national development. Chemistry education has been identified to be one of the major bedrock for the transformation of our national economy. Chemistry Education can be seen as the acquisition of knowledge or ideals relevant to chemistry. It is concerned with the impartment of knowledge on properties, components, transformations and interactions of matter.

Chemistry Education is therefore the systematic process of acquiring the fundamental knowledge about the universe. With these indispensable knowledge richly acquired, man can shape and reshape his world for his benefit. Hence, the development of the nation is usually measured by the degree and extent of growth brought to it through the enterprise of science education and a gate way to it is chemistry education. Chemistry education is the vehicle through which chemical knowledge and skill reach the people who are in need of capacities and potentials for development. In addition, chemical education addresses the social objective of substance development as education is now of the primary means for empowerment, participation, cultural preservation, social mobility and equity (Emmanuel, 2013).

The impact of chemistry on technology involves the process of bringing manufacturing inventories and sculpturing, designing etc. Technology can be seen as the application of scientific knowledge, skills, work, attitudes, tools and equipment in evaluation of new processes

and adoption of these processes to the production of goods and services for the benefit of mankind (Hornby, 2010). Chemistry education plays important role in enhancing the quality of teaching and research as well as ensuring that students are equipped with good knowledge to produce intensive goods and services to meet human needs for food, health care products and other materials aimed at improving the quality of life. Every single material thing in the universe is a chemical and the ability to understand and manipulate these chemicals is responsible for everything from modern food and drugs to plastics and computers. Conclusively, the ideas of chemistry are not getting the attention they desire in either formal or informal education provision. It is argued that an improvement in this position requires the further development of the nature and quality of chemical education to chemical industries through intensive and extensive research.

Chemistry education is needed in the professional development of chemical industries required in the establishment of modern technology and operation of chemical industries. The process of chemical transformation involves intra-chemical reactions within the same substances examples, sublimation, radio-active decay like uranium, plutonium and other chemical reactions when the substances react with other things which includes the evaporation of volatile substances like fuel, Mentholated spirit and even water when exposed to air. Really, chemistry can be used to find solution to problems of everyday activates in science, industry, technology, government, educational sector and economics.

Some of the industries that obviously cannot do without chemistry include; cosmetics industry, brewery industry, chemical industry, textile industry, food processing and technology industry, forestry, Agricultural industry, petroleum, pharmaceutical industry etc. Man’s success in the different realm of chemistry provides ones unquenchable source of hope for success in

technology. Whatever technology is, be it monster, man is poised to face it challenges having gained courage, built in confidence in himself as he overcomes the seemingly impenetrable mysteries of chemistry. To be able to operate machinery involved in technology, good dosage of simple experimental concept like observation and recording, theory and principles and measurement to take record of events that are needed. Also market forces succumb to the supremacy of social chemistry which includes simple experiment formulation such as record and observation, profit and loss, minimum and maximum, to the more complex ones like optimization theory and also operation research such experimental expressions.

Development is the gradual growth of something so that it becomes bigger, more advanced and stronger (Hornby, 2010). Mohammed and Bello (2013) sees development as growing or becoming industrialized. National development is the ability of a country or countries to improve the social welfare of the people. The question is whether this could be done through the knowledge of chemistry education? Educational institutions everywhere are established to carry out the role of teaching, research and community services, thereby contributing meaningfully to the social, economic, cultural, political, scientific and technological development of any nation (Iji, Abch and Uka, 2013).

2.2 Problems Associated with the Teaching of Basic Science

Inadequate teaching

Inadequate teaching has been one of the problems of science education in Nigerian schools. Inadequate teaching is an ineffective teaching. Effective teaching only occurs when students learn and achieve many scientific goals and not just being able to repeat scientific knowledge (Omoifo 2012). During an effective learning, students develop conceptual understanding and

thinking skills which helps them change their intuitive and to incorporate scientific concepts into their daily activities.

Ayodele (2006) identified the use of inappropriate and non-effective teaching methodology as a major factor hindering students understanding and achievement in science. The teaching and learning of science do not require theoretical and lecture approaches. Many teachers teaches science as an abstract thereby making science lessons boring and students find it difficult to grasp some scientific concepts and skills.

Abduallahi (2007) and Ogbeba (2010) observed that most teachers emphasize theory rather than practical aspects of science subjects and most of them lack adequate knowledge of the subject matter and the competence to deliver. In addition, they stressed that teaching science have been reduced to a descriptive exercise through the use of lecture method and very little inquiry.

Quality of Teachers

Poor quality of Basic science teachers in terms of adequate knowledge base is another factor identified to influence students' performance. The teachers' academic qualifications, knowledge of subject matter, competency, skills and commitment have a great impact on the teaching and learning of Basic science. Okureme (2003) posited that: An effective science teacher should be a master of his subject, as well as grounded in methods of teaching and be able to relate the science concepts to real life experience.

Different studies have showed that the most important resource input in schools that predicts student achievement is teacher's quality and an effective teacher will have students with good test score (Dahar, Dahar, Dahar and Faize, 2011).

Academic Qualification

Teacher's academic qualification is also a factor that will affect the teaching of Basic science either positively or negatively. An academically qualified teacher has more authentic knowledge about the relevant subject than the less academically qualified teacher. Molnar (2002), reported some studies in which students taught by certified teachers consistently outscored those taught by uncertified teachers. He posited that a poorly trained teacher will likely produce a poor doctor, engineer, architect, fellow teacher and a poor society.

Professional Qualification

Professional qualification can be termed as the preparation for a life-long journey into the teaching profession. The basic skills and abilities of the teaching learning process are developed in a teacher through professional qualification. Most private academic institutions embark on employing cheap labour where unqualified or less qualified persons are employed to be teachers. Unemployment too on its own side has pushed many graduates from numerous fields into teaching without passing through any teacher training institutions. Omayuli and Omayuli, (2009) posited that most of the science teachers teach Mathematics, Physics and Chemistry, rather than specialists actually trained to teach the subjects.

Teachers Remuneration and Incentives

Remuneration which can also be termed as salary is a very important predictor of student's achievement because it has the capacity to arouse and improve the qualities of the teacher and his teaching. It is the duty of the teacher to improvise the unavailable teaching resources and improvisation sometimes could be cost effective so if the teacher is not well paid, he/ she may not be buoyant enough to purchase some needed items. A well remunerated teacher will be more effective as he is motivated to use his abilities, competencies and skills. (Omorogbe and

Ewansiha 2013) poor remuneration affects the morale of teachers, distracts and hinders their commitment and effectiveness.

Attendance of workshop and seminars

Workshops, seminars and in- service trainings are continuous and on- going process for teachers throughout their professional life as it helps to keep them updated and informed about new innovations and concepts in the teaching of their subjects. Teachers who do not attend seminars and workshops tend to lack recent information about their subject matter. Okhiku (2005) noted that teachers are not finished products even after the completion of the professional academic programme; it was in recognition of this fact that it was stated in section 6:70b of the NPE that "Teachers shall be regularly exposed to innovations in their profession".

2.3 Availability, Quality and Relevance of Teaching Resources

Lack of ideal resources for teaching Basic Science has been a major issue of concern. It is a well-known fact that the quality of education a student receives largely depends on the quality of teaching resources available.

Teaching resources are the materials used by the teacher during teaching to aid understanding and make teaching successful and effective. They include Modern text books, equipment, consumables like Chemicals and reagents, models, charts and the physical learning environment which include the science classrooms and laboratories.

The situation in many schools in Nigeria is nothing to write home about. In many schools, there are no laboratories. Some schools merely have empty rooms labeled laboratories. Students rarely have hands- on, minds- on experiences.

Class size

Class size has been termed as one of the numerous factors that affect the teaching of science in schools. Apart from knowledge impartation, it is also the duty of the teacher to cater for the individual learning needs of the learners. This could only be effectively done in a moderate class which should not exceed 40 students. Although Dror (1995) noted that teachers have little or no control over class size because it is an administrative decision. Various researchers conducted on class size have concluded that teaching of science is more tedious and strenuous in a larger class and this have adversely affect the morals, motivation and self- esteem of the teachers. In large classes, teaches spend more time controlling, organizing and managing class activities and not enough time on meeting the individual needs of the students with different learning abilities.

2.4 Usability of Resource Available

Science deals with the phenomena of nature. These phenomena cannot be studied effectively through abstract or theoretical discussions only. Currently, in all systems of education, Mathematics and Science teaching is set to involve practical work (Kwale SMASSE, 2005). Most science students find that actual objects, models, or living specimens make phenomena concrete enough to be understood (Trowbridge, 2004). According to Maundu, Muthwii and Sambili (2005), a classroom teacher requires various kinds of teaching resources such as textbooks, apparatus, chemicals, charts, models, motion pictures as well as facilities such as laboratories and others to enhance the effectiveness of his/her instruction. A resource is any source of information, expertise, supply or support. Resources play an important role in enhancing the teaching /learning process by modifying the teaching and learning situation. The use of the resources involves a broad range of the human senses at the same time in the learning process. This facilitates learning and helps in conveying the intended purpose. According to

Ogembo, (2012), every bit of chemical knowledge is a direct result of one or more careful and unbiased experimental observations. Most of these observations are made by using at least one or more of the five senses. Students‟ performance in practical work is determined by proper use of laboratory tools (glassware, and equipments) and the correct execution of procedural techniques (filtration, titration, preparation of solutions) (Kwale SMASSE, 2005).

According to Bhagwan (2005), a growing body of research in the cognitive science suggests that students learn and better retain what they learn when engaged in „authentic‟ learning tasks. Twoli (2006) maintains that in many countries, the school Chemistry curriculum is more laboratory-based, and a large proportion of learning is spent on practical or hands-on experiences. He goes on to say that the practical sessions accord the students an opportunity to manipulate concrete objects, specimens, equipment and chemicals under the guidance of the teacher. There results from this an increased interaction between students, resources and teachers among many other benefits. This is more so important considering that practical lessons among other factors help learners prepare for the practical examination (Ogembo, 2012). Performance in the practical examination is vital since KNEC has a rule that for a candidate to have a good pass in science, Chemistry included, a pass in practical paper is compulsory. The extent to which students access learning resources particularly those that aid in application of chemical concepts in practical lessons goes a long way in determining students‟ overall performance in Chemistry.

According to Nderitu (2009), most if not all schools have a rule that students are responsible for apparatus under their use. Should any break during use, they are to pay for the broken apparatus. Considering that most of the apparatus used in Chemistry are glass wares most of which are expensive, many students shy away from experiments due to this rule. He therefore recommends a reversal of this rule for meaningful learning and hence performance. This study attempted to establish the prevalence of this practice in schools in Kwale County and if it had any effect on students‟ quality manipulation of the Chemistry practical learning resources.

Ogembo, (2012) argues that availability of instructional resources does not necessarily translate into effective teaching and learning of a subject. Adequacy of resources is much more important in achieving the latter. This is because most of the resources play an important role in understanding concepts and imparting skills to the learner (Franyo, 2007). The learner can only adequately acquire these concepts and skills through the actual use of or contact with the resources. This is particularly important in the sciences where the hands-on approach to learning has been demonstrated to play a crucial role in the understanding of concepts and retention of content taught, as well as developing the ability to think scientifically. Determining the quantity and extent of use of resources for teaching and learning of Chemistry in selected schools of Kwale County formed a crucial segment of this study. Ogembo, (2012) suggested that learners should be made aware that scientific principles apply in everyday things and are not confined to the special apparatus, usually imported from abroad, and only found in the laboratories. This is particularly important in rural schools which have very few equipment and at times no chemicals due high cost of the commercially available resources for teaching and learning Chemistry. Okafor (1996) reported that 5% of the post–primary schools in Lagos State, Nigeria had no laboratory; schools with laboratories were ill-equipped with human and material resources.

These factors, which are not peculiar to Lagos State alone, are likely to affect student's achievement in Chemistry. It is due the prevalence of such a scenario in most rural schools that the SMASSE project came up with improvisation. It was the interest of this study to determine the level of improvisation in Kwale County schools. How possible is it to improvise Chemistry materials, supplies and glass wares using locally available materials? Have the teachers embraced improvisation and how is it affecting learning of Chemistry? What is the impact of improvisation on hands on experience in rural schools of Kwale County? These are some of the questions that this study endeavored to ask.

2.5 Emperical Study

Emendu (2014), examined the role of chemistry education in national development with reference to chemical industries. The study concentrated on chemical industries in Anambra State, Nigeria. Four industries with a sample of one hundred (100) workers were chosen by the researcher using simple random sampling. Instrument used for data collection was the questionnaire. Mean and standard deviation were used to analyze the data collected. The results of the analysis showed that chemistry education helped in national development of chemical industries. The findings showed that students should endeavour more time to learn about chemistry education, because it will help them in many fields of life especially in chemical industries. Recommendations were made.

Anisa et al (2017), this paper was focused on the problem of raising global awareness in the context of chemical literacy. It is the purpose of this paper not only to discuss the difficulties but also the possibilities that exist within chemistry education for the development of global awareness. By focusing, as it does, on the relationship between the self and the natural environment. This paper discusses the difficulties that exist, such as the students‟ involvement

with the natural world, as their object of study, and the modeling of the natural world, and the purpose of learning chemistry, as well as the possibilities for promoting the development of such relationship by keeping the natural world, as an object of study, in the foreground of the teaching-learning process. Other possibilities refer to the awareness of the personal and wider significance of chemistry ideas and issues, the wonder evoked by chemistry ideas and by natural forms and phenomena, the aesthetic appreciation of the natural world, and the „story of the universe", as a story that addresses the interconnection of chemistry and human life. A discussion, however, of the importance of raising awareness, especially in the context of education, is imperative. Therefore, this study has recommended integrating environmental concepts into the chemical curriculum for all students irrespective of their academic in order to increase the global awareness.

Milan, (2015) Chemistry is an important subject due to understanding the composition and structure of the things around us. The main aim of the study was to find out the perception of chemistry by lower secondary school pupils. The partial aims were to find out the influence of gender, year of study and favorite subject on the perception of chemistry. The sample size comprised 379 Czech lower secondary schools pupils. The questionnaire was used as a research tool. It consisted of 25 5-point Likert type items. Items were, after application of factor analysis, divided into four categories: 1. The interest in chemistry, 2. The relevance of chemistry, 3. The future life and chemistry, 4. Chemical aids and laboratory experiments. Reliability of the research tool was determined by Cronbach's alpha which had value $\alpha = 0.87$). For the data evaluation the methods of inferential statistics were used, concretely analysis of variance (ANOVA). Pupils had low positive perception of chemistry. Statistically significant differences between boys and girls and also between 8th and 9th graders were not found out. In the

conclusion part the possibilities of next research and also recommendations for practice are presented.

Joseph & Okere, (2015) carried out a study on Academic achievement of students in schools is very important to stakeholders in education and those outside education subsector. The falling standard in our education system evidenced in the poor students' performance in recent time beckons for a probe to unveil the actual causes of the development. In view of the above, researchers and educators have studied several variables that could be responsible for the poor and falling standard and had come up with deferring results. However, the synergy of these variables on students' academic achievement have not been fully examined which is why this study is raised. The study examined the synergy and relationship between academic achievement of students in Basic science and parent's socioeconomic and educational status, alongside school location. It adopted a correctional design to examine the relationship between parents SES, educational level and the location of schools with students' academic achievement in Rivers State. The population of the study consisted of all the students in the selected schools in the three senatorial districts of the state; out of which a sample of two hundred (200) students were randomly selected. Three null hypotheses were raised and tested at 0.5 level of significance. Data were gathered through a self-designed instrument titled the Students Performance Questionnaire (SPQ) and Teacher's Questionnaire (T.Q).The null hypotheses were tested using one way ANOVA, t-test and regression analyses. Findings show that the synergy of parent's socioeconomic status and location of the schools strengthened students' academic achievement in Basic Science. However, the study revealed that the educational background of the parents does not synergize with other variables to influence the academic achievement of students.

Omiko, (2016) evaluated the Classroom Experiences of Basic Science Teachers in Context of Competencies and Opinions. Two instruments were developed and used for the study, the instructional skills performance level (ISPL) based on five-point performance scale and questionnaire. The two instruments were developed by the researcher and validated by 3 specialists in Science Education, one from measurement and evaluation and two from biology and Chemistry. The questionnaire was administered on 200 Basic Science Teachers randomly selected from Ebonyi State Junior Secondary schools. The questionnaire was divided into 2 sections. Section I contains all the variables. Section II contains a 10-point item scale constructed by the researcher seeking the opinions of basic Science Teachers. It also contains a list of 76 instructional materials used in teaching Basic Science. The Results showed that Basic Science teachers seem to have a title performance level in classroom management and students participations and in evaluation/summary. They performed averagely in the remaining 3 instructional skills; it was also found that most teachers who teach Basic Science used lecture and demonstration method in teaching. Based on the findings, recommendations were made.

2.6 Summary of Review of Related literature

A large number of related literatures have reviewed as provided in the empirical studies. Several scholars carried out their investigation on achievement in basic science, perception of chemistry by lower level secondary school, examined the role of chemistry education in national development with reference to chemical industries among others (Omiko, 2016, Milan, 2015, Anisa et al, 2017 Amendu, 2014).

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

This research presents the methodology of the research. The research was propounded under the following:

1. Research Design

2. Population of the Study

3. Sample and Sampling Techniques

4. Research Instrument

5. Validity and Reliability of the Research Instrument

6. Method of data Collection

7. Method of data Analysis

3.1 Research design

In this study the descriptive cross-sectional survey design was adopted. The survey design is appropriately convinced for this study as it enable the researcher to have the opportunity to ascertain the level of awareness, familiarity and usability of chemistry concept in junior secondary school in minna metropolis.

3.2 Population of the study

The population of this study comprises the entire Junior Secondary School (JSS 3) student in, Minna metropolis, Niger State. The population was 1200 students that is Male (700) and female (500) students.

3.3 Sample and Sampling Techniques

The sample of the study was sixty (120), Male (70) and Female (50); random sample were used to select the two schools used also simple random techniques was used to select the sixty (120) (70male and 50 female) JSS 3 students in Minna metropolis.

3.4 Research Instrument

A structured questionnaire was designed for data collection in this study. Questions were formulated to elicit responses from the respondents. The questionnaire was divided in sections (A, B, C and D). Section A was designed to collect personal data section B and C was designed to find out awareness and familiarity while section D a design to find out the usability of chemistry concepts among junior secondary school students in minna metropolis. The instrument was named Awareness, Familiarity and Usability of Chemistry Concept Questionnaire (AFUCCQ) using four point rating scale for section B and C of Highly Aware (HA) = 4, Aware (A) = 3, Moderately Aware (MA) = 2, and Not Aware (NA) = 1 for section B and C which comprises of ten (10) items while section C with four point rating scale of Strongly Agree (SA) = 4, Agree (A) = 3, Strongly Disagree (SD) =2 and Disagree (D) =1 has ten (10) items.

3.5 Validity and Reliability of the Research Instrument

The instrument was validated by two lecturers from Science Education Department Federal University of Technology Minna. All corrections given by the validators were effected. A pilot test was conducted in one of the school in the population but not among the sampled schools for the study to test the reliability of the instrument. A total of fifteen (15) JSS 3 students in the school (Government day Secondary School Minna). These respondents are not within the selected sample respondents which will be used for the final study but share similar characteristics in almost respects. The questionnaire were distributed and personally retrieved in single administration by the researcher. Reliability was tested using Cronbach alpha coefficient and tested with 0.76- 0.83 coefficients.

3.6 Method of Data Collection

The researcher obtained permission from the principal of the two (2) schools under study. Researcher personally contacted the JSS 3 students during class period and seeks their cooperation and full participation in the study. The retrieved questionnaire were completed, collected and subjected to data analysis.

3.7 Method of data Analysis

The data collected was analyzed using descriptive statistics of mean and standard deviation. Decision score of 2.50 and above will be taken for Agree.

CHAPTER FOUR

4.0 PRESENTATION AND DISCUSSION OF RESULTS

This chapter is discussed under the following sub- headings presentation and analysis of data collected and summary of the findings. The results are presented below:

4.1 Answer to Research Questions

Research Question 1: What is the level of student's awareness of Chemistry concept among junior secondary school?

To answer tis research question mean and standard deviation was used.

Table 4.1: Mean and Standard Deviation of Students' Awareness of Chemistry Concept among Junior Secondary School

S/N	Items Statement	Mean	SD	Remarks
1.	Chemistry is an aspect of basic science?	2.49	1.00	Not Aware
2.	Chemistry aspect of basic science is interesting?	2.37	1.08	Not Aware
3.	Are you aware of chemistry as a subject?	2.22	1.15	Not Aware
4.	Chemistry aspect of basic science is difficult to learn	2.59	0.99	Aware
5.	Chemistry aspect of basic science is boring?	2.38	0.93	Not aware
Grand Mean and Standard Deviation		**2.41**	**1.03**	**Not aware**

Table 4.1 shows the level of awareness of chemistry concept in basics science. Respondent's shows negative attitude in items 1, 2, 3 and 5 as their mean results was less than 2.50 while items 4 only shows that the student are aware that chemistry concept in basic science are difficult with a mean 2.59. The grand mean 2.41 is less than the decision means 2.50 shows the low level of awareness of chemistry concept in basic science.

Research Question 2: What is the extent of student familiarity to the use of chemistry concepts in teaching among Junior Secondary School?

Table 4.2: Mean and Standard Deviation of Student Familiarity to the use of Chemistry Concepts in Teaching among Junior Secondary School

S/N	Items Statement	Mean	SD	Remarks
6.	I am familiar with separating mixtures with filter paper	2.19	1.03	Not familiar
7.	I am familiar with adding acid to water not water to acid	2.16	1.13	Not familiar
8.	I am familiar with some chemical symbols	4.34	0.93	familiar
9.	I am familiar with some chemical apparatus	4.03	0.94	familiar
10.	I am familiar with chemical safety measures	4.16	1.07	familiar
Grand Mean and Standard Deviation		**3.38**	**1.02**	**Aware**

Table 4.2 Most of the respondents are familiar with chemistry concepts taught in basic science as items 8, 9 and 10 shows high level of familiarity with their mean value greater than 2.50. only items 6 and 7 with mean values 2.9 and 2.16 less than 2.50 are not familiar with some chemistry concept in basic science. It is therefore, shows that the level of familiarity is higher because the grand mean 3.38 is greater than the decision mean 2.50.

Reasearch Question 3: What is extent of student usage of chemistry concept among Junior Secondary School?

Table 4.3: Mean and Standard Deviation of Student Usage of Chemistry Concept among Junior Secondary School

S/N	Items Statement	Mean	SD	Remarks
11.	Periodic table is often use during teaching elements	2.38	0.93	Disagree
12.	I use Chemistry text books	2.12	1.11	Disagree
13.	I always uses charts, models and other teaching aids during Chemistry lesson	2.09	1.14	Disagree
14.	I use blue and red litmus paper to indicate presence of acid and base during chemistry concept in basic science	2.25	0.94	Disagree
15.	I do not use charts, models and other teaching aids during Chemistry concept inbasic science	2.59	1.01	Agree
16.	Periodic table is not use during teaching elements	3.84	1.02	Agree
17.	I used filter paper for separating mixtures	1.91	0.79	Disagree
18.	Acid and base are often used during teaching acid and salt in basic science	1.88	0.86	Disagree
19.	I use chemical symbols are often used in writing equations	2.47	0.97	Disagree
20.	Chemical symbols are often memorized in the basic science	2.26	0.77	Disagree
	Grand Mean and Standard Deviation	**2.38**	**0.95**	**Disagree**

Table 4.3 most respondents disagree with the usage of some chemistry concept in basic science as their mean values are less than 2.50. while items 15 and 16 agreed with the usage with a mean values 2.59 and 3.84 and therefore, shows low level of usage as the grand mean 2.38 was less than the decision mean 2.50.

4.2 Summary of Findings

The summary of the findings of the study shows that JSS 3:

The Junior Secondary School Students are not aware of chemistry concepts taught basic science in their school in Minna Metropolis.

Some of the students are familiar with chemistry concept.

Most of the students disagree with the usage of chemistry concept in Minna Metropolis.

Discussion of result

In the light of the findings obtained on the level of awareness of chemistry concept in basic science there was low level of awareness. This was in line with the findings of Anisa et al (2017) whose focused was on problem of raising global awareness in the context of chemistry literacy.

In familiarity of the chemistry concept in basic science results shows that they were familiar with some chemistry concept in basics science. Milan (2015) in the findings showed that chemistry is an important subject due to understanding the composition and structure of the things around us as the result shows that student has low positive perception of chemistry.

Also, findings on usage of chemistry concept in basic science revealed that there was negative usage of the items in chemistry concept as it relate to basic science. This was supported by Ogembo (2012) as using resources made for it purpose brings about understanding of the concept and imparting skills to the learner

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter shows the summary, conclusion and recommendation of the study. The chapter was discussed under the following sub-headings, conclusion, recommendation, limitation for the study and suggestion for further research.

5.1 Conclusion

As a result of the research findings of the study the following conclusion was drawn

The study revealed that there are challenges in terms of using instructional materials that could draw the interest of the students in studying chemistry as a course.

Teachers could not properly introduce some chemistry concept during the teaching of basic science at the basic level of teaching.

The students familiarity was based on some chemical symbols that is used for substance (H_2O)

5.2 Recommendation

In the aspect of the findings of this research the following recommendations are made:

1. Teachers should utilize the available resources as to encourage the junior secondary school students towards learning chemistry.

2. Government should provide enough funds for schools and also provide special allowance for science teachers as to encourage them in use of instructional materials in teaching.

3. government should provide enabling environment that can help the science teachers explore their talent and adopt new technology in their teaching

5.3 limitation of the study

The following limitation can be observed regarding the following:

This study was carried out in minna metropolis of niger state. It may not be exact method in the finding generally across the nation without further investigation.

The researcher experienced some challenges in filling the questionnaire items due to the knowledge of the students as it takes time in translating the items to their understanding.

5.4 Suggestion for Further Study

Further studies can be carried out using the following:

i. Teachers awareness and acceptance of chemistry concept in teaching selected secondary schools in Niger state

ii. Assessment of the availability and usability of chemistry resources in classroom among secondary schools in Niger state.

iii. Awareness, familiarity and usability of chemistry concept in junior secondary schools among private and public schools in Niger state.

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APPENDIX A

AWARENESS, FAMILARITY AND USABILITY OF CHEMISTRY CONCEPTS AMONG JUNIOR SECONDARY SCHOOL STUDENTS IN MINNA METROPOLIS

Questionnaire for Students

This Questionnaire is designed to elicit information on awareness, familiarity and usability of chemistry concepts among junior secondary school students in Minna metropolis. Please tick (√) appropriately from the options provided below and complete the blank spaces with the necessary information as may be appropriate.

Thanks for your anticipated cooperation.

SECTION A (BIO DATA)

School: ----------

Gender:

☐	☐
Male	**Female**

RESPONSE GUIDE

Response categories

Highly Aware (HA) = 4, Aware (A) =3, Moderately Aware (MA) =2, Not Aware (NA) =1

AND

Strongly Agree (SA) = 4, Agree (A) =3, Strongly Disagree (SD) =2, Disagree (D) = 1

SECTION B:

Awareness of Chemistry Concept among Junior Secondary School Students'.					
S/N	**ITEMS**	**HA**	**A**	**MA**	**NA**
1.	Is chemistry subject taught in your school?				
2.	Is chemistry subject interesting?				
3.	Do you like chemistry subject?				
4.	Do you have chemistry teacher in your school?				
5.	Does your school have chemistry laboratory?				
SECTION C: Familiarity of Chemistry Concept among Junior Secondary School Students.					
6	I am familiar with separating mixtures with filter paper				
7.	I am familiar with adding acid to water not water to acid				
8.	I am familiar with some chemical symbols				
9.	I am familiar with some chemical apparatus				
10.	I am familiar with chemical safety measures				
SECTION D: Usability of chemistry Concept among Junior Secondary School Students.					
S/N	**ITEMS**	**SA**	**A**	**SD**	**D**
11.	Periodic table is often use during teaching elements				
12.	We use Chemistry text books				

13.	Our Chemistry teacher always uses charts, models and other teaching aids during Chemistry lesson.				
14.	We use blue and red litmus paper to indicate presence of acid and base during teaching acid and salt				
15.	Our Chemistry teacher do not use charts, models and other teaching aids during Chemistry lesson				
16.	Periodic table is not use during teaching elements				
17.	We used filter paper for separating mixtures				
18.	Sample of acid and base are often used during teaching acid and salt				
19.	Chemical symbols are often used in writing equations				
20.	Chemical symbols are often memorized in the Chemistry lesson				