



ACCOMPLISHING SOCIETAL NEEDS THROUGH CHEMISTRY CURRICULUM MODULATIONS IN NIGERIA

ELUOZO, COLLINS

Department of curriculum and Instructional Technology (Science Education Option)

Faculty of Education

Ignatius Ajuru University of Education, Port Harcourt, Nigeria

IGWE, JOY. C

Department of curriculum and Instructional Technology (Science Education Option)

Faculty of Education

Ignatius Ajuru University of Education, Port Harcourt, Nigeria

Abstract

Accomplishing Societal Needs through Chemistry Curriculum Modulations in Nigeria is a research paper crafted to elicit the present chemistry science curriculum contents, the public views of chemistry science transformation on the human society in Nigeria. The paper scrutinized the colonial curriculum in Nigeria and the changes that have taken place over the years. The perceptions of students and their level of participation in curriculum accomplishment in chemistry studies in Nigeria were surveyed. The socio-economic impacts of chemistry studies were assessed, stakeholders' previews and contributions were equally evaluated. The societal impacts of chemistry education in the enhancement of job creation, policy sustenance and guidance by the global communities in-view of the relevance of chemistry education was carefully articulated in this work. The paper highlighted some significant strides made from chemistry science in Nigeria in the 21st century. The resuscitation of herbal drugs and its relationships with chemistry science was fully discussed in this paper. The paper concluded with recommendations on the ways forward in building a strong nation through high level improvement in chemistry science.

Keywords: Chemistry, Science, Education, Modulation, Students, Curriculum, Society, Nation, Nigeria, Development, Needs, Employment, Job creation.

Introduction

Society is a predefined environment with unique features endowed by nature, that comprises several creatures including plants, animals, underground water, surface water, insects, air, humans and other numerous natural creatures and manmade. The existence of these creatures in one defined environment leads to interface and interactions which in most cases are positive and sometimes negative to one another. In the bid to discover how these interface and interactions functions, man the leading factor and the most benefactor of the environment coined the term society. Therefore, the society is a conglomerate of humans and other creatures sharing the same territory and environmental features. In-order to live as one society, humans started to scamper for relationship, knowledge about the environment and why other creatures were part of his kingdom. This curiosity caused more harm than good as man continues causing damage to the environment which other creatures retaliated against human insistence and the resultant effect is environmental pollutions.

Every natural creature has chemical formation in its constituent as compound or element. Water is a combination of hydrogen and oxygen dioxide, air is a combination of oxygen, carbon, nitrogen and other oxides so all so is the plant and animals. Animals and plants are the consummate units of the chemicals. All forms of chemicals are useful to humans but in various degrees and conditions. Some of the chemicals if not properly managed, are disastrous to man and the entire environment. The interaction between these creatures and there chemical deposits calls for a study because some are harmful to humans while others are beneficial.

Chemistry is the study of chemical deposits, formations, combinations, reactions, counter-reactions and experimentations among humans, plants, insects, human/plant, plant/plant, human/human and the environment at large. While education is the process of continuous update in human knowledge, search for solutions to human's problems and the quest to satisfied human needs without much ado.

Having seen so many challenges within the society of man, and the value of education to man in solving his daily problems, an organized form of education was established. In-order to get human needs resolved within the confines of chemistry, various aspects of the environment was chattered in a single file for implementation in the schools system to help inform the young scholars about chemical compositions and their respective effects in the society; hence the name chemistry curriculum was formulated.

How this modulation has assisted the society in solving her immediate problems as well as to serve as a referral point for future sustenance shall be of interest in this study.

Review of Related Literatures

Education has unremittingly played a distinctive function in our trades and industry improvement and social renovation course. Consecutive governments in appreciation of this task have accorded it a lofty precedence in the composition of resource allotment to education. This factor determines the wealth sustenance or poverty zone of a country.

In light of this, the conception of curriculum has attracted the attention of government functionaries and private institutions of higher learning including business merchants. The phrase national curriculum is a derivative from Latin word "Cirrus" which means administration of itinerary or competition chariots. As the meaning of education varies, so the perception of curriculum is. Comprehensively, curriculum is the package prepared for the learners to accomplish within a specified timeframe in which they will become experts in solving societal needs.

Nature of Chemistry Curriculum in Nigeria

Irrespective of divergent views about what constitutes a curriculum, its developmental role remains in the front burner of every citizen. As the meaning and its role implies, societal needs are equally progressive in nature which makes curriculum undergo regular innovations periodically. In view of this, questions override the other and some questions states; do Nigerians actually have curriculum that addresses her societal problem? To what extent has the curriculums addressed our problems? Are we making progress with this curriculum? What is the competence level of our chemistry graduates? These and many more questions prick the heart of Nigerians.

Problems of Chemistry Curriculum in Nigeria

The problem associated with Nigerian chemistry curriculum is the influence of the western cultures. The colonial masters came in with their style of education and formulated the kind of curriculum that best befitted their objectives in Nigeria but after the independence in Nigeria, Nigerians adopted the western curriculum hook-line and sinker without transformation into local contents, this error has been hunting our educational system more particularly in science subjects. In this observation, Eluozo (2018), postulated that

"Nigerian science curriculum and its organization are faulty, indicating short lesson hours, improper science teaching strategies among science teachers and lack of adequate science laboratories" as factors. In view of this, it would be imperative to state that the colonial curriculum no longer assist in developing the Nigerian society scientifically.

Therefore, it is pertinent for governments in Nigeria to be objective on science curriculum formation and equally set tenable targets on how to achieve the objectives through a well designed curriculum.

According to Todaro (1977), he observed the myopic and shallow natures of the colonial curriculum and underrated it as being very strongly urban biased with the sole objectives of preparing children to pass examinations through recitation, repetition and memorization without understanding the concepts and contents been taught. Eluozo in his views berated the current curriculum of having little or less consideration to the desires and aspirations of this present society, noting that a modern curriculum should be able to address scientific challenges pasting the society.

From the broad-spectrum on the colonial curriculum, it is significant to say that education performs the duties of a catalyst for rapid transformation in any society, and curriculum is the only educational instrument through which this change can occur, if curriculum cannot execute this societal aspirations in which it is directed for, then such curriculum is on the blink, and needs a total change. (Eluozo , 2018).

Definitions of Chemistry science

The meaning and definition of chemistry science speckles as numerous as there are diverse science scholars. To the layman, chemistry science is frequently seen in provisions of scientists who functions in the processes of chemistry science.

Otuka (1983), stated that chemistry science is man's effort to know about his environment and the chemical composites. Otuka's definition is in stroke with Ogunniyi (1986) who glimpsed chemistry science as an endeavor by human beings to systematize their knowledge regarding nature into momentous systems of chemical explanations. Conant (1951) defines chemistry as interface among series of chemical concepts and theoretical methods that have developed as a result of science experimentations and observations of chemical reactions within the environment. Conant's definition entails that chemicals are not permanent in nature but products of science chemistry, which are subject to change as soon as further experimentation and observations are made in conjecture with other chemicals. From the above descriptions, chemistry science can be viewed in three perspectives:

1. Chemicals can only be seen in terms of its products i.e. facts in form of concepts, laws, theories and physical reactions etc.
2. It can also be seen in terms of colour, changes, processes or methods of application i.e. observing, experimenting, measuring and testing etc.

3. It can also be seen in terms of attitudes of chemical scientists through problem solving approach.

Chemistry Science and National Development in Nigeria

Chemistry science symbolizes the archetype of the evolution of human knowledge and achievement in science. The achievement of science was interpreted as a snowballing process of mere knowledge and progression of conquest over ignorance and false notion. Significantly, science has advanced remarkably in the area of gadget usage but the advent of chemistry science has tremendously changed the array of human well being via pharmaceutical drugs development against diseases, food science and medical sciences. The primary aim of chemistry science is to develop chemical scientists who can explain, understand, predict and control natural and artifact disasters caused by chemical presence in the society. This postulate is on the grounds that science is the most influential avenue devised by man for arriving at truth and solutions to the challenges of human society.

Usefulness of Chemistry Science to the society

Abdullahi (1975) identified three major usefulness of chemistry science to the society as follows;

1. No other subject has affected man so directly like chemistry. This is evident in the products of chemistry in terms of drugs production, food science, medical science and environmental protections etc.
2. No other subject has given protections to man like chemistry in terms of nuclear weapons and power generation.
3. No other subject has generated employment like chemistry sciences.

The position of Abdullahi as stated above indicates that chemistry science interacts directly with the society to provide social-economic changes required for social-economic transformation of any nation.

Practically, the most prominent parameter of index assessment of a national status depends firstly on her live span index, scientific and technological advancement. For example, the United States of America, Britain, Russia and Japan, to mention but a few are regarded as developed nations because of their healthcare standards, territorial defense and energy generation, of which are all products of chemistry science. Nigeria is termed a developing nation because of her sarcastic state in chemistry science.

Other importance of chemistry science can be summarized as follows:

- a. Chemistry science has done so much to liberate mankind from the repression of superstitions, idol worshiping, animism, and associated beliefs that has killed so many persons due to ignorance of health science.
- b. In terms of biotechnology, the knowledge and information from chemistry science have contributed to improved artificial agricultural practices, pests and weeds control, and modern ways of cultivation as well as chemical assisted yields.
- c. Chemistry scientific has influenced the society positively in production of electricity, clothes making, and industrial revolutions.
- d. Chemistry science has helped in the discovery of surgery, preventive and curative drugs in Nigeria.

Chemistry Education in Nigeria

Chemistry education contracts the purviews of chemistry contents and processes with folks who are not painstaking customarily to be members of the chemistry science community; the folks could be students, business men and women or a whole community. Chemistry education in Nigeria focuses on the teaching of chemistry science contents and concepts, method of teaching and addressing misconceptions held by students concerning chemistry science concepts.

Chemistry education is very essential to the advancement of any nation; therefore every nation must take it very solemn in all organizations of learning. First world countries were able to attain that echelon due to huge investments in chemistry science and technological educations. Launching of sputnik satellites in October, 4th 1957 by the Russian government wouldn't have been possible without the confidence reposed by chemistry and physics science educationists.

Contributions of Chemistry Education to the Development of Nigerian Society

Chemistry education encompasses several subject matters specifically biology, chemical science, elements of physics, mathematics and language skills which are combined with education to produce a chemist. Although in Nigeria, chemistry education has not gained much attraction by students' enrolment in the schools system. This low enrolment in chemistry courses in our institutions may be associated to the perception that chemistry as a subject is so complex to understand. Collins (2018) identified society disdain, mockery of teachers and low prestige of chemistry teachers as factors of students' lethargy.

Grippingly, as essential as chemistry education, students' performance in Nigeria has not been heartening in all ramifications and this is bothersome and it calls for urgent survey.

The importance of chemistry education cannot be over emphasis, Tunde, O, Akintoye, O.H. & Adeyemo, S.A. (2017), Maintained that a graduate of chemistry education can easily gain

employment either self employed through private establishment of pharmacy, chemistry lab or public employment as medical practitioners, industrial chemists or as beverage establishments consultant.

Without chemistry education, drugs and food sciences wouldn't have been possible. Science and technological education will not be complete without chemistry education; for instance manufacturing, engineering, medicine, and building materials will not be possible without the aid of chemical scientists as well as chemistry educators who will teach the students the core contents of chemistry sciences.

In most institutions of higher learning in Nigeria, chemistry students are taught how to make dyes and chalks; such students can establish their own businesses in chalk and dye productions after graduation. If these visions can be realized and supported with funds, buying of chalks will be a thing of the past in Nigerian schools.

Chemistry Science and Employment Status in Nigeria

Chemistry Science being an eclectic subject that grooms children in the elementary level as basic science, in secondary as integrated science and chemistry subjects in tertiary institutions as chemical science, biochemistry, industrial chemistry and medical sciences etc has the following tasks to play in employment generation in Nigeria;

1. Chemistry Science builds up sound minds in science and technology that leads to self-reliance as craftsmen, lab science assistants, chemical engineers, doctors, atomic engineers and nuclear power engineers etc.
2. Chemistry Science grooms professionals in education as chemistry educationists. These graduates gains employment as teachers, instructors and lecturers of various institutions.
3. Chemistry Science gives confidence to the young scholars who will through the practical knowledge gained from chemistry become manufacturers of chemical products and other materials that will be of significant benefits to the society.

Chemistry Education and National Capacity Building

1. Chemistry Education sets the stage for unity in National building, chemistry being a subject of cooperative learning, students is taught cooperative thoughts in science classes, this attitudes helps in maintaining peace and tranquility in the society.
2. At the last run, students who studied chemistry science become engineers in several fields, and in turn they contribute in growing the economy as local company operators, such as construction engineers, structural, pipelines, chemical analysts, and healthcare

practitioners who averts the Nigerian governments the boredom of expatriates' employment in these fields of expertise.

3. Chemistry Education has boosted food production in Nigeria beyond imaginable range, especially in the aspect of biotechnology advancement, pests control and fertilizer production for horticultures.
4. Chemistry Education has promoted the conglomerations of orthodox and traditional medicines for cure and control of diseases. For instance the combinations of tetracycline and 7 keys to power for the treatment of measles, saint-leaf and salt for stomach ache, honey and aleovera leafs for the cures of cough etc. These promotions cut across economic viability and jobs creation in Nigeria.

Chemistry Students' Locally Produced Goods in Nigeria

Chemistry students have showcased the following products as internship goods:

Plastic cups, spoons, hangers, baskets, buckets, crates, jerrycans, polypropylene, polyethylene, polystyrene, polyesters, breakable transparent plastic cups, trays, rulers, mathematical set, toys, Synthetic fibers and textiles etc.

Conclusion

Irrefutably, it is key to note down that among the developed nations of the world, scientific feat predominantly within the industrial revolution era have brought significant events all over the globe; chemistry science have taken the drudgery out of earning a living; lengthened life, allayed ailments and eliminated the bane of smallpox. Also, chemistry science has made homes more contented and pleasurable to subsist in; it has abridged operational hours and augmented extremely the array of leisure-time recreation. Motivationally, it enables people to live healthier, happier and comfortable than was previously possible. If nuclear holocaust can be avoided, it will be hopeful to believe that human challenges will continue to be ameliorated via chemistry sciences.

The prospective contribution of chemistry science and technology to developmental objectives is broadly acknowledged. Chemistry science and technological knowledge has donated enormously into human society, conceivably more than any other course of studies in terms of economic growth and development in Nigeria through the cure, control and preventions of diseases, development and enhancement of industrial productivity, the conception and modification of novel substances and leeway of surpassing the precincts of vista. Nevertheless, the creation of so many departments in modern chemistry science and technology have been identified as one of the root cause to inequitable dissection of toil prioritizing prolific actions in science and

technological contents in a few developed countries. Consequently, under-developed countries still employ primitive production techniques which make them reflexive addressees of innovations emanating from current research in chemistry science in the urbanized countries.

The significance of building a strong indigenous chemistry science and technological manpower in Nigeria is long overdue. However, it is a longtime task that requires shatterproof in remedying and prevailing over barriers in chemistry knowledge-transfer process and the zeal to institutionalize modern chemistry knowledge. In view of this, the notion and believes that modern science knowledge is predominantly residue in the developed countries needs to be erased totally in the minds of Nigerian scholars and focus on importing the required science knowledge for real development. In order to achieve these objectives, some bottlenecks needs to be identified and cleared as follows:

1. Nigerian research council has to scrutinize research documents and make use of the ones relevant to chemistry curriculum.
2. Government should provide enough funds for chemistry science research.
3. Oversea training and research in chemistry should be instituted.

The chemistry curriculum should be crafted in the order to ensue chemistry students to; Observe chemistry concepts, Identify chemistry problems, Classify chemistry problems, Ask questions about chemistry concepts, Design experiments, Formulate hypothesis, Control variables, Measure and in-cooperate numbers, Keep accurate chemistry records, Make inference with other concepts, Make predictions of chemistry data and Communicate chemistry problems and findings.

Proposals

Findings from this study unveiled a lot of bottlenecks; in-order to achieve a well refined chemistry curriculum capable of addressing societal challenges, the under listed proposals are made:

1. Chemistry courses should be broken down into consumable units at the lower levels of education
2. Chemistry should be disintegrated from other subjects in Integrated Science and be taught as well be given more attention.
3. Chemistry curriculum should be simplified for easy implementation by the chemistry teachers.
4. Governments should build more modern laboratories in our schools systems.
5. Chemistry practical should be made compulsory in the secondary level of educations.

References

- Abdullahi, A. (1982). *Science Teaching in Nigeria*. Ilorin, Atoto Press
- Eluozo, C. (2018). Teachers' Trait as an Impediment to Physics Students Academic Achievement Among Secondary Schools in Ikwerre Local Government Area, of Rivers State. *Ceka international journal of basic and applied sciences*, 4(1), 50-57.
- Eluozo, C. (2018). Discovery Learning: A pedagogical Approach in Science Education. *Hezekiah University Journal of Contemporary Research*, 8(1), 115-122.
- Conant, J.B. (1955), *Science and Common Sense*. New Haven, Yale University press
- Oguniyi, M.B. (1986). *Teaching Science in Africa*. Ibadan Salem Media.
- Omosewo, E.O. Views of physics teachers on the need to train and retrain Physics teachers in Nigeria. *African Research Review*, 3 (1), 314-325.
- Otuka, J.O.E (1983) Science Curriculum in Nigerian Secondary Schools, some cultural implications in curriculum development. *Unpublished paper presented at the international symposium on time cultural implications of science Faculty of education ABU Zaria, Nigeria*. Retrieved online 12/10/190.
- Todaro, M.P (1977), Economics for a developing world. Longman Group Ltd. London, P.283-288.
- Tunde, O, Akintoye, O.H. & Adeyemo, S.A. Career prospects inPhysics education in a quest towards entrepreneurial skill Development. *Research Journal of Social Sciences*. 1 (6), 1-5.