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TEACHERS' PERCEPTION AND BACKGROUND IN CHEMISTRY: IMPLICATIONS FOR BASIC SCIENCE EDUCATION IN PRIMARY SCHOOLS

IGBOEGWU, EKENE N.

Department of Chemistry

Nwafor Orizu College of Education, Nsugbe

P. M. B. 1734, Onitsha, Anambra State

E-mail: igboegwuekene@gmail.com

Phone: +2348064552325

ABSTRACT

Science, particularly chemistry had become the life wire of any nation. This study was prompted by the importance of a solid foundation of chemistry in Universal Basic Education (UBE) and the level of background in science by teachers in the primary school. 500 teachers in primary schools were selected from Anambra State for the study through random sampling. A questionnaire (QFPS) was used to collect data for the study. The QFPS consisted 3 sections; three research questions guided the study. Data collected were analyzed using means, standard deviations and percentages. The results showed that majority of the teachers of primary schools were not professionally trained science teachers. The teachers lack confidence to teach basic science even though they perceived science as an important subject for primary school pupils. They also had positive perception towards chemistry but lacked an effective pedagogical approach to it. Educational implications were discussed and recommendations made among which are: teachers who were professionally trained in science should be employed specifically to teach basic science classes instead of leaving the basic science teaching to class teacher who had no idea of science.

INTRODUCTION

Universal Basic Education (UBE) is a free and compulsory education for all children from the age of six to fifteen years and literacy training for adults. In Nigeria, UBE programme was introduced in 1999 in fulfillment of the government signatory to a number of international declarations on education. This includes Jomtien Declaration of Framework for Action on

Basic Education. The UBE act was passed into law in the year 2004 (Tahir, 2005). Tahir further explained that at the end of nine years of continuous education, every child should acquire appropriate level of literacy, numeracy, communication, manipulative and life skills, be employable, useful to him or herself and the society by possessing relevant ethical, moral and civic values. Thus, the vision of UBE has taken care of all that it entails to bring socio-economic development.

According to Obioma (2007) following the decision of the Federal Government to introduce the 9-year basic education programme and the need to attain the Millennium Development Goals (MDGs) by the year 2015 and the critical targets of the National Economic Empowerment and Development Strategies (NEEDS), which can be summarized as: value re-education, poverty eradication, job creation, wealth generation and using education to empower the people, there was therefore, the need to review, restructure and re-aligned the then existing curricular for primary and junior secondary schools (JSS) to fit into the 9-year Basic Education Programme. The National Council on Education (NCE) at its meeting at Ibadan in December, 2005 directed the Nigerian Educational Research and Development Council (NERDC) to carry out this assignment. The NCE also approved a new curriculum structure namely: Lower Basic Education Curriculum (Primary 1-3), Middle Basic Education Curriculum (Primary 4-6), and Upper Basic Education Curriculum (JSS 1-3) with subject listings.

If the vision of UBE is to bring about socio-economic development as explained by Tahir (2005), the role of science education in UBE programme cannot be said to be over emphasized. The world over, it is generally agreed that development could be meaningful if and when it is science and technology driven. As such, countries of the world are now categorized as developed, developing or underdeveloped as a result of their scientific and technological attainments. Hence, the incorporation of Basic Science as a core-subject in the 9-year Basic Education Programme. The 9-year Basic Science Curriculum according to Adeniyi (2007) is the product of re-alignment and restructuring of the revised curricula for primary science and junior secondary school integrated science. In selecting the contents, three major issues shaping the development of nation worldwide, and influencing the world of knowledge were identified. These are globalization, Information and Communication Technology (ICT) and entrepreneurship education. The desire of Nigeria to be identified with contemporary development worldwide called for the infusion of relevant contents of four non-school curriculum innovations in the areas of:

- Environmental Education (EE)
- Drug Abuse Education (DAE)
- Population and Family Life Education POP/FLE
- Sexually Transmitted Infection (STI) including HIV/AIDS

Infusion of content occurred in every class from basic 1-9. Generally, primary education is the bedrock of the education continuum. It is at the primary school that the solid foundation for science particularly in chemistry can be laid. Igboegwu (2012) pointed out that the formative years of a child are the best years to sow the seed of interest in science, especially in chemistry. Furthermore, Igboegwu (2019) indicated that early experience of science in the home and

school influence children acquisition to science process skills. She also opined that almost all the renowned scientists develop interest in their profession at the age of seven. Early interest in science particularly in chemistry among the primary school pupils is therefore, necessary for the technological growth of the country. But what background have the primary school teachers in science particular in chemistry to enable them tackle the challenges of teaching basic science?

Teachers form an insurmountable factor in the successive teaching of basic science in primary schools. Omodudu (2019) pointed out that it would take educators with imagination and passion to help bring science especially chemistry to life especially among the primary school children where the teacher is the facilitator. Put differently, it is the teachers' responsibility to provide the opportunity to these young children to become acquainted with science especially in chemistry. Teachers in the primary schools are entrusted the responsibility of inculcating the early interest in chemistry among the primary school children, for the teacher factor controls the input and output variables in education (Chukwu, 2018). Omodudu (2019) pointed out that teachers' action in the science classroom is influenced by their own perceptions of science and method of teaching science.

RESEARCH QUESTIONS

The following research questions guided the study:

1. To what extent are the teachers in primary schools qualified to teach basic science that have chemistry concepts?
2. What are the perceptions of the teachers in basic science that involve chemistry concepts?
3. What are the backgrounds of primary school teachers in science particular in chemistry?

METHOD

A total of 500 teachers in primary schools of Anambra State were randomly selected for the study. A questionnaire of Teachers in Primary School (QFPS) consisting of 3 sections was administered to the subjects. Section A was used to collect information on the qualification and area of specialization of each respondent. Section B was formulated using 4-point scale where the respondents expressed their level of agreement and disagreement on their perception in basic science with chemistry concepts. Section C was open-ended questions where the teachers had the choice of ticking which idea was satisfactory and not satisfactory with the items. Any item with mean below 2.50 was rejected while items with mean 2.50 and above were accepted. Data collected were analyzed using mean and percentage.

RESULTS

Table 1a: Primary School Teachers Qualification and Area of Specialization

	No of Teachers	Ph.D.	M.Ed.	B.Sc./B.Ed.	NCE
Science education	61 (12.2%)	-	22	86	50
Non science education	439 (87.8%)	3	62	210	70

Table 1b: Mean and Percentage of Primary School Teachers in Different Field of Science.

Field of Science	N	Percentage (%)	Mean \bar{x}	S. D.
Biology	22	36.1	2.80	1.67
Chemistry	4	6.6	0.66	0.81
Physics	3	4.9	0.049	0.22
Computer Science	2	3.3	0.033	0.18
Health and Physical Education	12	19.67	0.200	0.45
Integrated Science	15	24.6	0.25	0.50
Mathematics	3	4.9	0.049	0.22

Table 1a and 1b showed that 439 (87.8%) of the teachers are non-professionally science education trained teachers while only 61 (12.2%) of them are professionally trained education teachers, then Table 1b showed different fields of science subjects.

Table 2: Primary School Teachers Perception of Basic Science with Chemistry Concepts.

Items	Mean (\bar{X})	Standard Deviation (ST)
1. Basic science should be taught in primary school.	3.8	1.9
2. I am comfortable with hands - on activities	2.3	1.7
3. I look forward to basic science classes	2.2	1.5
4. I feel comfortable teaching topics in basic science particularly those with calculations	1.7	1.3
5. I feel confident about my abilities to teach basic science particularly those with chemistry concepts.	1.90	1.4
6. I love teaching basic science with chemistry background	2.3	1.5
7. I feel qualified to teach basic science	1.5	1.2
8. I feel comfortable explaining inquiry-based science	1.3	1.1
9. I am familiar with use of science apparatus/ equipment	1.4	1.2
10. Basic science is as important as reading English and Mathematics	2.8	1.7

Table 2 showed that majority of the teachers in primary school perceived the importance of basic science especially those with chemistry concepts as indicated in items 1 and 10, even though majority of them are not professional science teachers. However, many of them cannot manipulate science apparatus/equipment nor were able to explain some scientific concepts especially those that involve experiment and calculations.

Table 3: Primary School Teachers Background in Science particularly in Chemistry.

Items	Percentage Response
1. Science is:	
Experimenting	
Enjoyable/interesting	40%
Abstract/difficult	10%
Facts	30%
	20%
2. Inquiry-based science involve	
Asking questions/finding solutions	87%
Confused	13%
3. Characteristics of a Scientists include:	
Curious/inquisitive	18%
Experimenting	17%
Smartness	19%
Persistent/patients	13%
Creative	10%
Organized	3%
All of the above	20%
4. Goals of Chemistry Programme include:	
Encourage inquisitive nature	20%
Relate to real life	21%
Promote exploration	22%
Hands on activities	28%
Be enjoyable/interesting	09%
5. Recall of elementary science	
	57%
I cannot call	10%
Just recalled particular activity	10%
Recalled textbook used	23%
Recalled how the teacher taught some primary science lesson	

Table 3 showed the responses of teachers to the open-ended questions which provide teachers' background to science particular in chemistry. 40% indicate that science is experimenting, 20% indicate it is abstract and difficult, 10 associated science with facts while 10% indicate is enjoyable and interesting. In item 2, 87% of the teachers indicated that science as an inquiry-based involved asking questions and finding solutions while 13% state that they are confused. Item 3, the respondents had a problem stating the goals for primary school basic science programme, instead they prefer to list the characteristics. When they were asked to describe their elementary school science experiences, 57% could not remember any experience, 23% recalled how the teacher taught some science concepts, 10% remembered a particular science activity and textbook used respectively.

DISCUSSION

From the responses to the items in table 2, with the exception of the mean values of Items 1 and 10, the rest were below the accepted mean value of 2.50. However, most of the teachers in the primary schools lack the confidence and ability to teach basic science especially the concepts that involves calculations because they were not trained in science. This finding further confirmed Table 1a where majority of the teachers (87.8%) were not professionally qualified science teachers. The result was in line with the report of Omodudu (2019) that most of the teachers in the primary schools were not professionally trained science teachers. The simple explanation to the above findings could be that they were not exposed to science particularly chemistry in their primary school days as a result they lack the basic scientific skills and knowledge. This prevented many of them from studying science particularly chemistry in tertiary institutions. Secondly, the fact that science was regarded as male-dominated subject in those days, made Ezeliora (2010) to say that so many people particularly women to be afraid of studying science.

On the other hand, the teachers showed positive perception of science, particularly in chemistry. They also seemed to be open to new ideas and approaches to chemistry but because they were not professionally trained to be science teachers.

RECOMMENDATIONS

This study showed that majority of the teachers in primary schools were not professionally trained science teachers, especially in chemistry. Many were not opportune to be taught basic science with new approaches to science teaching. The primary school teachers need in-service training to up-date their skills and knowledge of teaching basic science in primary schools. They should be sponsored to seminars, workshops and conferences in methods of teaching basic science. The teachers who were professionally trained science teachers should be employed specifically to teach basic science in primary school classes instead of leaving the basic science teaching to the class teacher who has no idea of science.

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