

# Universal Basic Education (UBE) and Effective Science Teaching Strategies in Kaduna State, Nigeria

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## ABSTRACT

*The study focuses on the Universal Basic Education (UBE) and Effective Science Teaching Strategies in Kaduna, State. A survey was conducted using 25 Junior Secondary Schools in Zaria metropolis where 10 schools with 53 teachers were randomly selected and used for the study. The instrument for data collection was a questionnaire on the Strategies employ by Junior Secondary School Teachers (UBE) teachers in Zaria Metropolis. The instrument was validated and pilot tested with the reliability coefficient of  $r = 0.70$ . The instrument was administered by the researcher. Data collected was analyzed using descriptive statistics. The results indicate that 50% of the Junior Secondary School Teachers Start with questions about nature of whatever subjects they were teaching. 25% only provide historical perspective and 70% of the teachers supported the used of ICT in teaching. Based on the results it was recommended that Government and NGO's should encourage teachers to attend conferences and workshop and provide ICT facilities for effective lesson delivery.*

**Keywords:** *Strategies, ICT and UBE.*

## INTRODUCTION

Universal Basic Education (UBE) is a programmed designed for all children of school age in Nigeria. This programme was designed for sustainable lifelong learning comprising both formal and informal situations to enable learners to achieve functional literacy. The main thrust of establishing the UBE scheme was to arrest the decline and decay in education aimed at achieving basic education and national development (FME, 2004). With this in mind, it become necessary to review, restructure and realigned the curriculum into a 9-year basic education programme. The goals of UBE from Curricular Perspective are to:

- Provide the child with diverse knowledge and skills for entrepreneurship, wealth generation and educational advancement;
- Inculcate values and raise morally upright individuals capable of independent thinking and who appreciate the dignity of labor and
- Provide opportunity for all children to develop manipulative skills that will enable the child to function effectively in the society and realized his/her full potentials (UBE, 2008).

The goals are capable of offering desirable opportunities to the learners and the society upon successful completion of the 9-year basic education. This is because the learner is expected to have acquired appreciable level of literacy, numeracy, manipulative, communicative and life skills as well as the ethical, moral and civic values needed for laying a solid foundation for lifelong learning. Teaching is a process of imparting knowledge to the learners. The interaction that results in imparting knowledge to the learners ought to be professionally conducted by using effective strategies and teaching materials. According to Jibrin (2007) a teacher as a director of learning should, among other things, be able to set and define lesson objectives, organize lesson materials, direct learning by using effective strategies and evaluate students' achievement. Therefore, when such is done, then we can say learning has been imparted. Though it has been observed by Akale and Ojo (2001) that some science teachers are not properly trained, do not vary their method of teaching and do not make use of instructional materials, Wasagu (2007) and Bukar (2006) continued that some science teachers lack basic knowledge of the subject matter. Ito (2012) observes that some teachers adopted poor strategies in teaching. The above submissions can affect effective science teaching and learning in our schools and hence UBE implementation. The study was to determine the strategies adopted by Junior Secondary School Teachers for effective UBE activities in Kaduna State.

### **METHOD**

A survey was conducted using 25 Junior Secondary Schools in Zaria metropolis and out of the total, 10 schools with 53 teachers were randomly selected and used for the study.. The survey was carried out using a questionnaire on the strategies employed by Junior Secondary School (UBE) teachers in Zaria Metropolis. The instrument was validated by two experts from Faculty of Education, ABU, Zaria. They made some suggestions in the area of language used and the averaged of the subject matter. The corrections were made as pointed out. The instrument was pilot tested at Government Junior Secondary School, Soba and the reliability coefficient was found to be  $r = 0.70$ . The instrument was administered by the researcher with the help of two research assistants. Data collected were analyzed using descriptive statistics.

### **RESULTS AND DISCUSSION**

The results show that 50% of the Junior Secondary School teachers start with questions about nature of whatever subjects they were teaching. This will assist the teacher to introduce his/her lesson and carried the learners' along. Twenty five percent of the sampled teachers provide historical perspective which can help the learners to connect the past with the present experience. Seventy percent of the sampled teachers inclusion of Information and Communication Technology in Teacher Education. That is, 70% of the teachers supported the used of ICT in teaching. Kelechi (2013) has decried the poor state of ICT facilities in institutions in Nigeria. Alhassan (2013) also reports that there exist insufficient and poor ICT facilities in Senior and Junior Secondary Schools in Nigeria. Forty percent of the sampled teachers engage students actively. Thirty percent of the sampled teachers

concentrate on the collection and use of evidence. Forty seven percent of the sampled teachers insist on clear expression. Forty percent of the sampled teachers welcome curiosity. Fifty six percent of the sampled teachers reward creativity. The actualization of these laudable goals will not be possible without putting in place deliberate and well articulated strategies. Some of these strategies are; start with questions about nature, engage students actively, concentrate on the collection and use of evidence, provide historical perspective, insist on clear expression, use a team approach, de-emphasize the memorization of technical vocabulary, welcome curiosity, reward creativity, provide abundant experience in using tools and support the roles of girls and minorities in science.

***Start with questions about nature:*** According to American Association for the Advancement of Science (AAAS, 1990), sound teaching usually begins with questions and things that are familiar and interesting to the learners. Therefore, students need to get acquainted with things around them such as organisms, materials, shapes and numbers- to observe them, collect them, handle them, describe them, ask question about them, argue them and try to find answer to their questions. The above mention can develop science process skills in learners which may lead to functional literacy and numeracy.

***Engage students actively:*** Students need to have many and varied opportunities for collecting, sorting, observing, note taking and interviewing. The teacher should assist the learners in using hand lenses, microscopes, thermometers, cameras and other common instruments available. Students should be able to dissect, measure, count, compute and explore their environment. Jibrin (2010) observes that by engaging students in learning will develop in learners the skills of problem-solving which are necessary for developing self-confidence and creativity in learners. This will assist the learners solve problems encounter in life.

***Concentrate on the collection and use of evidence:*** Students should be given problems at level appropriate to their maturity that require them to decide what evidence is relevant and to offer their own interpretation of what the evidence means. Since science makes use of observation, classification and so on, the teacher needs to note that students need guidance, encouragement and practice in collecting, sorting and analyzing evidence. This I believe will assist in developing functional creativity and curiosity in learners.

***Provide historical perspective:*** The teacher need to guide the learners to encounter many scientific ideas presented in historical perspective. Students should be made to realize that the roots of science, mathematics and technology dated back to early Egyptian, Greek, Arabian and Chinese cultures.

***Insist on clear expression:*** The importance of fluency in language of communication cannot be over stressed; therefore teachers should assist the learners to acquire the skills of both oral and written communications. In connection with the above Kasim (2007) once stressed that science teachers need to emphasize clear expression of which without procedures and scientific findings will not be consume by the society. It is therefore important to call on all science teachers to please assist learners to develop the habit of fluency in language of communication.

**Welcome curiosity:** It has been opined (AAAS, 1990) that science teachers do not create curiosity. They rather accept it, foster it, incorporate it, reward it and discipline it. It is in line with the above therefore science teachers should encourage students to raise questions about the material being studied, help them on how to frame their questions clearly enough to begin to search for answers, suggest to them productive ways for finding answers and reward those who raise them.

**Reward creativity:** Science educators have submitted that scientist and engineers prize the creative use of imagination. Therefore the science classroom ought to be a place where creativity and invention are recognized and encouraged (AAAS, 1990 and Wakili, 2007). Science teachers need to guide students towards creative thinking and invention for scientific and technological development in Nigeria.

**In-service training:** Studies have shown that most science teachers in Nigeria are poorly trained or exhibit poor grasp of the subject matter (Jibrin, 2007 and Bajah, 1996). It is important to note that teacher training is an ongoing exercise that needs the intervention of all stakeholders in education. It has been suggested that science teachers that were not able to enroll for regular training in our institutions should do that through part time (LVT). This will surely assist towards effective science teaching and learning in Nigeria. Most of the strategies listed above cannot be successfully employ in the era of insufficient funding as it affects educational sector, laboratories, equipment, poor knowledge of the subject matter and poor condition of service as it affects teachers as rightly observed by (UNESCO/MOE, 2004; Wasagu, 2005 and Yaduma, 2007) respectively.

**Inclusion of Information and Communication Technology in Teacher Education:** The premise that ICT is important for bringing changes to classroom teaching and learning is the basis for this pressure. These skills include the ability to become lifelong learners within a context of collaborative inquiry and the ability to work and learn from experts and peers in a connected global community (Law, Pelgrum and Plomp, 2008). Information and Communication skills that involved the use of computer and its accessories are a key resource for effective teaching and learning. ICT includes communication devices or applications, encompassing: radio, television, cellular phones, networks, software, and satellite systems, as well as the various services and applications associated with video, conference and distance learning. Tinio (2002) notes that ICTs are powerful enabling tools for educational change and reform. When used appropriately, different ICTs help expand access to education, strengthen the relevance of education to the workplace, and raise educational quality by creating an active process connected to real life. Teacher Training Institutions need to find means of developing a curriculum on ICT and make it compulsory for all pre-service teachers. Nneji (2012) reports that ICT brought a revolution to information needs of the society because it:

1. Provides easy and quick access to sources of information and materials;
2. Increases teachers' and learners' creativity and intellectual resources;
3. Is capable of increasing learners' concentration, mental cognitions, motivation and self-esteem;

4. Providing opportunity for e-learning thus making learning globally competitive;
5. Causes healthy interaction among learners who use mobile phones, e-mail, internet to communicate;
6. Gives teachers opportunity to reach a large number of learners at the same time, and,
7. To provide teachers quick means of assessing learners

In line with the above it has been observed that information society demands a workforce that can use technology as a tool to increase productivity and creativity. This involves identifying reliable sources of information, effectively accessing these sources of information, synthesizing and communicating that information to the learners for effective learning (Alibi, 2004). It is a must for a Nigerian teacher to be ICT compliance for the realization of goals of UBE in Nigeria.

### **Some implementation problems of Science Education Policy in Nigeria**

For effective implementation of science education policy and science teaching in Nigeria to go with developed countries such as Japan, India and USA the following among others need to be considered:- Insufficient funding, qualify science and technology teachers, instructional materials, power supply and laboratories, Students over population and Poor knowledge of the subject matter by science and technology teachers among others.

***Insufficient and Qualified Science and Technology Teachers:*** The success of our science and technology programmed depends to a greater extent on qualify and adequate science and technology teachers (Bajah, 1996). This could lead to poor comprehension, application for self-reliant, productivity and attainment of Science Education policy in Nigeria. Let us look at Bauchi State as examples on the number of science teachers. In a survey carried out by UNESCO/MOE, 2004 in Bauchi State. In Secondary schools Mathematics teachers are 369 instead of 628, Biology 206 instead of 501, Chemistry 79 instead of 428 and Physics 72 instead of 435 (UNESCO/MOE 2004). Is the situation different in Kaduna State? With the above, achieving sound and qualitative science education policy will be impossible.

***Insufficient Science and Technology Laboratories:*** Science and technology cannot be learned without adequate and well equipped laboratories were science process skills are learned for self reliant. Wasagu (2005) lamented the poor attitude from the point of views of research grant allocations and expenditures of Nigeria 0.1%, Brazil 0.4%, Japan 2.8%, Germany 4.3%, Israel 3.1%, U.S.A. 2.9% and Singapore 0.9%. Based on the above you can't compare the scientific and technological development in the countries as enumerated. In most secondary schools, there is no sufficient science and technology laboratories even the multipurpose one for affective teaching and learning science and technology. Yaduma (2007) reported that in most schools where there are workshops and laboratories the equipment is not functional. Let us look at the conditions of laboratories in Bauchi state as of 2004. Physics has 13 instead of 28, Chemistry 17 instead of 30, Biology 21 instead of 67; integrated science 7 instead of 67 and Agricultural Science 7 instead of 67 (UNESCO/MOE 2004). Also in Borno State Bukar (2006) reports inadequate

infrastructure and facilities for both teachers and students and overworked facilities. What is the situation in Kaduna State? From the above it is evident that the facilities are overused with the current student's enrolment all over the country.

***Insufficient ICT facilities in Junior Secondary Schools:*** Information and Communication skills that involved the use of computer and its accessories for effective teaching and learning. ICT includes communication devices or applications, encompassing: radio, television, cellular phones, networks, software, and satellite systems, as well as the various services and applications associated with video, conference and distance learning. Jibrin, (2010) & Kelechi (2013) have decried the poor state of ICT facilities in institutions in Nigeria and Alhassan (2013) also reported that there exist insufficient and poor ICT facilities in Senior and Junior Secondary Schools in Nigeria.

## CONCLUSION AND RECOMMENDATIONS

Science education is a vital tool that is needed for any nation that wants to be among the developed nations as shown in science expenditure allocations and the examples of Japan, India and USA. There is the need for government and the society in general to give needed attention towards effective training pre-service teachers for achieving sound science education policy in Nigeria of which the foundation is the basic science offered at Primary and Junior Secondary Schools Level. Based on the results of the study, the following recommendations are made:-

1. Teachers need to further their education so as to update their knowledge that will assist them in proper teaching.
2. Government and NGO's should come to the aid of these institutions by providing ICT facilities for effective lesson delivery.
3. Teachers need to carry out improvisation to assist them in employing some of the strategies identified.
4. Government, PTA and NGO's should encourage teachers to attend conference and workshop on teacher education.

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