

Enhancing Universal Basic Education in Nigeria:
Scientifically Literate Teacher as a Key Factor to Goals
Actualization

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Abstract

This paper examined the science teacher as a key factor to the realization of Universal Basic Education (UBE) goals in Nigeria. The UBE scheme was launched in 1999 in Sokoto heralding the formation of states Universal Basic Education Boards with the goal of ensuring that children have access to 9-year basic education from primary to junior secondary. Reasons for low quality teachers included faulty process of selecting candidates for teacher education programs; the curriculum; physical facilities and staff recruitment factor. Relevance of the UBE curriculum as a pivot for economic growth and development underscores the need for a quality science teacher. Presently, a very great number of people teaching at primary and junior secondary school levels are non-professional and non-scientifically literate teachers without requisite pedagogical skills and knowledge of teaching. Lack of capacity building, under funding and school monitoring and supervision are among several other factors affecting the production of quality science teachers with devastating implications on the attainment of UBE goals. It was recommended that the process of admission into teacher education program should be revisited with a view to producing teachers that are scientifically literate; outreach campuses should be abolished; workshops and re-training opportunities should be given to science teachers and instructional materials supplied to help enrich the teaching and learning process.

Introduction

There is a growing consensus among policy makers, researchers and the general public that teachers largely determine whether schools will succeed in the crucial task of helping students with knowledge and cutting-edge technological skills for life-long aspirations in a consistently dynamic and dysfunctional society. More importantly, research has shown that teacher quality is the most important factor influencing students' achievement. Ayodeji (2004) asserted that the indicators of quality must promote advancement of knowledge and mastery of skills as well as prepare the learner for a meaningful life in the world. Unfortunately, there are growing signs about the lack of quality of teachers in the nations' classrooms.

Nevertheless, the Universal Basic Education (UBE) scheme was specifically introduced in the 4th republic by the Obasanjo administration and launched in September 1999 in Sokoto. The UBE Act was signed on 26th May, 2004 which makes primary and junior secondary education free and compulsory for all children within the target population and also guarantees regular funding from the Federal Government for the program (Tahir, 2005). The Universal Basic Education (UBE) program is a nine (9) year basic education program whose scope of operation involve the development of programs and initiative for early childhood education and focus on: six year Primary Education and a three year Junior Secondary Education. The UBE Act (2004) saw the establishment of the state Universal Basic Education Boards (SUBEBs) in all states of the Federation. UBE Implementation guidelines stipulate that: every child that passes through the system should acquire appropriate levels of literacy, numeracy, communication, manipulative and life skills and be employable by possessing relevant ethical, moral and civic values. The National Policy on Education (FCN, 2004) defined basic education as the 6 years of primary education and 3 years of junior secondary school. The program is

supposed to stimulate learning from the early age of 3 to 5 years which is called early child care development and education (ECCDE). The Universal Basic Education program could be likened to the old Universal Primary Education (UPE) scheme launched in 1976; which apart from been free and universal, it is compulsory (Obasanjo, 1999). The program was introduced to meet the Education for All (EFA) and Millennium Development Goals (MDG's) as an integral strategy of eradicating extreme hunger and poverty; promote gender equality; reduce child mortality; improve maternal health; combat HIV/AIDS; ensure environmental sustainability amongst other goals (Ejeh, 2009).

Prior to the launching of the UBE scheme, there were at various periods educational policies: the 1955 comprehensive education laws of the western Nigeria; the 1957 Universal Primary Education (UPE) of the eastern region and the 1976 UPE program. The Murtala/Obasanjo military regime launched the scheme again in 1976 to reduce the educational imbalanced between the northern and southern parts of Nigeria. Since then, several governments have introduced educational policies which were immediately changed by successive government. Each education policy established by a different government administration was criticized by the successive new government when it takes over (Utibe, 2001). Thus, the present UBE scheme curricular is expanded to contain the study of science, civic education, aesthetic creative art crafts and music amongst other subjects. This expansion of UBE program created attendant problems of inadequate infrastructure, instructional materials, quality teachers and supervision amongst so many other problems. Adamaechi and Romaine (2000) are of the view that, the short supply of teachers led to the employment of 'market women' half-baked individuals as teachers. They noted that the UPE programs failed because it attracted wrong caliber of people into teaching profession who were neither qualified nor committed to

their jobs. Odo (2000) posited that, in a bid to meet up with increased demand for teachers, government recruited less qualified people to teach, hoping that quick orientation/training under the present UBE scheme will improve them. Adebimpe (2001) opined that for the UBE scheme to succeed, adequate efforts must be put in place to produce sufficient qualified teachers and make them relevant within the limit of their specialization.

UBE Objectives

In consonance with the goals of National Policy on Education (2004), the UBE scheme (2000) encapsulated the following objectives which are expected to positively transform the nations' basic education sector at the primary and junior secondary school levels:

1. Ensuring access to 9 year basic education from primary to junior secondary.
2. Provision of free, universal education to every Nigerian child.
3. Reducing drastically the incidence of dropout from the formal school system through improved relevance, quality and efficiency.
4. Ensuring the acquisition of appropriate levels of literacy, numeracy, manipulative and communication skills as well as the ethical, moral and civic values needed for laying a solid foundation for life-long learning.

These objectives were to energize the education sector to actualize the nations UBE vision with the teacher as critical stakeholder.

Relevance of the UBE Curriculum

The curriculum for implementing Universal Basic Education program was released in 2007 by Nigerian Educational Research and Development Council (NERDC) to improve on hitherto existing curriculum which was found to be deficient in catering for relevant basic education components for the Nigerian child. A relevant curriculum is a *sine qua non* to the

actualization of UBE goals. According to Emechebe (2012) relevance in any educational system is occupied with issue of whether or not the educational system is producing manpower with skills necessary for economic growth. A cursory look at the objectives of the UBE clearly envisioned the areas expected to benefit from the implementation of the scheme. The Nigerian child at the end of 9 year basic education should have acquired appropriate skills, literacy, numeracy, communication and manipulative competences. As such, he is employable because he possess relevant skills, ethical and morals aptitude to be useful himself and for the society. Furthermore, the Nigerian child becomes a useful tool for economic and technological advancement of the nation thus facilitating the realization of vision 20:20:20.

Therefore, the need for a relevant curriculum that will serve as the pivot for future development of huge human resources in Nigeria cannot be over emphasized. Before now, the former curriculum had not really catered for other important areas of skills development in relation to our national developments; reflective thinking; manipulative and communication skills; moral and civic education among others. The curriculum also seeks to encourage entrepreneurial skills among primary and junior secondary school students to make themselves useful in case they drop-out of school. Skills acquired will therefore assist them to become relevant in their societies.

The new basic education curriculum also recommends the training and re-training of teachers with competencies for learner-centered teaching approach for critical thinking and reflection. This will ensure effective transmission of cognitive knowledge for the realization of UBE goals (Emechebe, 2012).

The success of the UBE program will accordingly rely on the provision of physical infrastructure and instructional materials for

quality learning to take place in the classroom. The reason for non-application of skills learnt by teachers could be attributed to poor condition of schools' infrastructure, insufficient supply of instructional materials and large class-size (Eidet, 2011).

The implementation of the curriculum of UBE curriculum will help take away school-age going children off Nigerian streets. This is capable of eliminating street begging (almajiri syndrome), street hawking, child-abuse and trafficking and underage marriages.

Teacher Quality as an issue in Nigeria's Education

The phrase 'teacher quality' may be difficult to define. Any attempt to define it may open an opportunity for cheap criticism. However, the writer has attempted to explain this from the perspectives of; teacher education; teaching environment; teacher earning; learners' readiness to learn; curriculum content to be learnt; learning process and outcome. If the objectives of UBE are to help Nigerian children acquire knowledge, skills, capacities for active and productive life to be realized by 2015, then the quality of teachers must be appraised:

Teacher education: what happens in the classroom may depend on so many factors; teacher training; sufficient knowledge of the subject matter; knowledge of varied teaching methodologies; knowledge of language of instruction; ability to reflect on interest and abilities; understanding the purpose of the curriculum; ability to communicate enthusiastically; teacher character and ethical discipline; ability to build good interpersonal and community relationship; and dedication to the goals of teaching (UNESCO, 2003).

Teaching environment: central to the teacher ability to deliver educational goals is the issue of classroom environment. The provision of moderate and ventilated classroom size with

instructional materials, text books can enhance quality learning. However, empirical studies revealed that most schools are dilapidated, with inadequate textbooks and other instructional materials (Uko, Okoh & Omatseye, 2007).

Teacher earning: enhanced teachers emolument is the key to effective delivery of quality instruction in the classroom. There is the need for pay-rise for teachers in order to attract best brains to take up teaching as a profession. The apathy shown to teaching may be attributed to poor wage which is a reality viewed from incessant strikes in almost all levels of our education. In the 1970's and early 1980's, those who took-up teaching immediately after University degree or NCE were given incentives like car and motor-cycle loans. In addition, they were posted to boarding schools with free housing and furniture. Even with improved revenue from oil resources accruing to the nation, the education sector still remained underfunded with less than 10% annual budgetary allocation.

Learners' readiness: basically, children that are well nourished are healthier and learn better in school. To this end, some states universal basic education boards introduced free breakfast (feeding) to their students. However, this free feeding program has been stopped or is not being sustained consequently leading to increased drop-out, street hawking, and child labour early marriages.

Curriculum content: the UBE curriculum can be described as too bookish because it is overloaded with subjects. This has really posed challenges to teachers in trying to implement the curriculum scheme. Obanya (2010) has expressed concern that overcrowded curriculum is a threat to quality learning. And a quality teacher is relevant to curriculum content delivery and acquisition of basic skills.

Learning process and outcome: instructional materials are non-existing in classrooms and even laboratories. Quality teaching requires the presence of relevant and adequate learning materials to impact positively on knowledge and skills development. Today's teachers are poorly trained to improvise were real laboratory equipments are not available and coupled with the fact that they lack sufficient knowledge of pedagogical approaches to use. Naturally, the outcome of such a classroom is under achievement and failure/cheating (examination mal-practice) which has almost become a norm. The products of this educational system become ready tools for social restiveness/upheavals in the wake of economic and political melt-down.

Quality Teacher Education Programme in Nigeria

The teacher is a crucial factor and instrumental to successful delivery of education process. Babalola (2003) opined that teachers are the centre for quality improvement in education and upgrading the capacity of teachers would help in giving quality education to school children, since they are the foundation upon which a country builds its sustainability. Quality teacher education program is pivotal to producing competent teachers for the realization of educational goals. It is a common knowledge today that candidates admitted for teacher education programs in Nigeria are those with below the required cut-off mark for competitive and lucrative courses in Jamb and Post-UTME and academically weak (Emechebe, 2012). Thus, a good percentage of the students admitted for teacher education programs are uninterested and uncommitted to the program (Nakpodia, 2011). The Nigerian Certificate in Education (NCE) program is the minimum teaching qualification for both teachers in primary and secondary school levels. The holders of this certificate are criticize for lacking cognitive, methodological and psychological capacities to undertake teaching since most of them are students considered not qualified to secure

admissions into Universities (Igbemi, 2011). A large proportion of the students admitted in Colleges of Education are those that do not have the requisite entry qualifications through preliminary programs (Ejeh, 2009). Furthermore, Ejeh (2009) posited that, the products of teacher education program of Nigerian Universities and Colleges of Education are bound to be of low quality for three major reasons:

1. Faulted process of selecting candidates for teacher education program
2. Curriculum of study for would-be students teachers
3. Poor institutional framework as it affects staff recruitment; physical facilities; funding and other factors that border on effective instructional delivery

Today, the issue of decayed or absence of infrastructure in Universities and Colleges of Education have lead to incessant industrial actions by unions as if that is the only way to call governments attention to these institutions. Even when governments know that, no educational system rises above the quality of its teachers. The one time vice chancellor of University of Abuja, Professor Nuhu Yaqub was quoted to have said "the teacher of today is hardly a teacher because teachers' are not knowledgeable as they ought to be and as such cannot transmit knowledge as they out to" (Daily Sun, 2008). The whole education industry is in dare need of special government intervention so as to reverse the myriads of problems that is continuously dwindling our capacities as a nation to the actualization of the goals of UBE.

Professionalism, Teacher Quality and Efficiency

Teaching as a profession is supposed to be undertaken by people who have acquired the knowledge and specialized training/skills of transmitting knowledge to students. Teaching at all levels of education in Nigeria has become an

all-comers profession with all manner of people (Bello, 2012). Therefore, teacher quality is directly proportional to the quality of teacher education programs received by prospective student teacher (Bello, 2012). To be effective or efficient in teaching, the teacher need to be equipped and given the enabling environment for practical demonstration of their skills in addition to having policy frameworks that will support their professional conduct. Where teachers are not adequately trained and qualified, then these expectations will be far-fetched. Today, out-of-field teachers are been employed by states and federal government as announced recently by President Muhammadu Buhari (PMB) led administration to tackle insufficient teachers' to teach in our schools. It appears that, government has opted to recruit and package people as emergency teachers with minimal orientation. For UBE goals to succeed, adequate provision for well-trained teachers must be central to effective and efficient implementation of UBE scheme. Increased access to primary and junior secondary education in Nigeria has brought an attendant problem for teacher recruitment. They are required in large numbers but there is the critical need to have the right quality (Nakpodia, 2011). The National Policy on Education (2004) has clearly stipulated that the minimum qualification for entry into the teaching profession at any level in the Nigerian schools system should be the Nigeria Certificate in Education (NCE). The number of non-professional teachers in Nigerian education sector is lamentable which has further confounded the quality of learning delivery and ethical values expected of a professional teacher. Adequate care must be taken not to repeat the mistakes recorded in the past where similar educational policies failed due to the employment of grossly defective individuals as teachers.

Constraints to Teacher Quality

There are several identified factors to

production of quality science teachers with capabilities, resourcefulness and attitude to teaching to enhance achievement in the classroom. Hornby (1998) describe constraint as a factor that limits or restricts an individual potential. Some of these constraints are:

1. **Capacity building:** The teacher is supposed to be always abreast with techniques and skills of effective teaching to be able to deliver his/her subject matter. Capacity building programs should be frequently organized to ensure competency in teaching and learning process. It is perhaps the only avenue of helping teachers update their knowledge especially when they cannot be enrolled for further studies.
2. **Under funding:** The prevailing state of funding in our institutions of learning has left them to contend with dilapidated and run-down structures, inadequate infrastructures and facilities most of which are outdated and obsolete. The teacher is very likely to under achieve in this condition thus preventing him from contributing to students' performance.
3. **Community participation:** Immediate members of the community should be involved in school affairs pertaining to: staff recruitment, quality assurance, availability and utilization of instructional materials, class-size, funding, and school location and on other issues pertaining to the school. Interest shown for teacher quality by the community contributes to teacher preparation and effective learning. Government has formed school-based management committees (SBMC) so as to involve parents in the smooth running of the school to improve attainment of schools goals and students' aspirations.
4. **Transparency and accountability:** Efforts must be put in place to ensure that funds allocated to management of UBE scheme are judiciously utilized to cater for every aspect of the school.

Embezzlement of funds meant for teacher training and conference are often misappropriated or underutilized for the purpose it is meant. So, teachers either embark on self sponsorship or refuse to further their education which limits their abilities to deliver optimally.

Monitoring and supervision: there is the urgent need to revitalize the monitoring and supervisory units of both federal and state ministries of education especially in the area of teaching and learning. Proper supervision will prompt teachers to prepare adequately before going to the class and students are more likely to understand better the concepts.

Over-crowded classrooms: the yet-to-be teacher is been groomed under a very crowded classroom/theater without receiving adequate training or attention during training. Somebody who himself received nothing cannot give anything. High rate of students' population will over-stretch school facilities and equipments thereby posing problems to teaching process. Large number of

students in class also makes it difficult for the teacher to give adequate attention to slow-learners (Igbemi, 2011).

Scientifically Literate Teacher as a Key Factor to UBE Goals Actualization

It is important and for actualization of school goals that teachers' should teach students how to think. Therefore, teachers of all school subjects should share in accomplishing this overall goal. There is a substantial agreement within the academic community that the levels of national and international scientific literacy among the general public are undesirably low for our technologically driven society (Scearce, 2007). Science contributes its unique skills, with its emphasis on hypothesizing, manipulating the physical world and reasoning from data. The scientific method, scientific thinking and critical thinking have been terms used at various times to describe these science skills. Science- A Process Approach (SAPA) grouped process skills into two types-basic and integrated (Padilla, 1990). The basic (simpler) process skills provide the foundation for learning the integrated (more complex) skills:

Table 1a: Basic Science Process Skills

Basic Science Process Skills	Activities
1. Observing	Using the senses to gather information about an object or event
2. Inferring	Making an "educated guess" about an object or event based on previously gathered data or information.
3. Measuring	Using both standard and non-standard measures and estimates to describe the dimensions of an object or event.
4. Communicating	Using words or graphic symbols to describe an action, object or event.
5. Classifying	Grouping or ordering objects or events into categories based on properties or criteria.
6. Predicting	Stating the outcome of a future event based on pattern of evidence available.
Integrated Science Process Skills	Activities
1. Identifying and Controlling variables	Being able to identify variables that can affect an experimental outcome, keeping most of them constant while manipulating the dependent variables.
2. Formulating hypotheses	Stating the expected outcome of an experiment. Usually an intelligent guess that may or may not be true.
3. Experimenting	Being able to conduct an experiment, including asking an appropriate question, stating a hypothesis, identifying and controlling variables, operationally defining those variables, designing a "fair" experiment, conducting the experiment, and interpreting the results of the experiment.
4. Interpreting data	Organizing the data and drawing conclusions from it.
5. Formulating models	Creating a mental or physical model of a process or event.

We cannot expect students to develop skills that they have not learnt. Thus, teachers need to develop multiple skills to deal with content areas of UBE curricular. While it may not be easy for the teacher to develop these skills, it probably remains the best option for the actualization of UBE goals in Nigeria if we must march towards the 22nd Century world of uncertainties.

Conclusion

While the attainment of UBE goals are challenging, if any further progress is to be recorded in Nigeria, it then has to rely heavily on the strength of the quality of its teachers. The process of training and recruitment of quality and efficient teachers must be a serious issue that is beyond politics, lip-service and rhetoric. Although government education policy

document continues to indicate government commitment to providing quality education, it appears that we are as a country perpetually in planning and lacking the will to implement or translate intentions into real actions.

Recommendations

To redress the current slide in the education sector, especially at the basic educational level in Nigeria, the following recommendations were made:

1. The process of admitting students into science teacher education programs in Universities and Colleges of Education should be revisited. Only candidates with educational qualification/requirements and interest should be admitted
2. Outreach campuses without laboratories

for acquiring science education qualifications similar to the one run by National Teachers Institute (NTI) in secondary schools as centres should be abolished.

3. Excesses of Colleges of Education mounting remedial programs for weak students should be checked to reduce the production of half-baked science teachers.
4. Governments should put an end to recruitment and posting of individuals to schools to teach science subjects in primary and junior secondary education levels as a means of reducing unemployment.
5. Adequate supply of instructional materials to teacher education institutions will help produce quality science teachers for the nation education industry.
6. More opportunities for training and attendance of conferences and workshops within and outside the country should be provided to science education teachers.
7. Teachers' salaries should be enhanced and regular to encourage bright academics to take up teaching profession.

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