CHAPTER 5

CURRICULAR REFORMS AND MATHEMATICS TEACHERS' EDUCATION IN NIGERIA

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Abstract

In this paper, the curricular reforms and mathematics teachers' education were discussed with special reference to the country Nigeria. However, the paper particularly delved into highlighting developments in mathematics teachers' education in Nigeria. This paper therefore looks at curriculum reform, mathematics teachers' education and finally takes a look at curricular reforms and mathematics teachers' education. Hence, conclusions and recommendations were made.

Introduction

Mathematics Education has been widely acclaimed to be the index of measuring any nation's socio economic and geo-political development (Adolphus, 2011). Hence, curricular reforms and mathematics teachers' education in Nigeria have been discussed below.

Curricular Reforms in Nigeria

Curriculum historically has been defined as a body of courses to be run and a guide. In the levels of schooling from primary to senior level, curriculum may take on different meanings and connotations. For the primary level, it may be referred to as the sum of lessons and teaching designed to improve national test scores. At the senior level, the curriculum is referred to as those courses required for high school diploma. The singular term for curricular reforms is curriculum reform. Curriculum reform is a challenging and difficult task. The effort to ascribe a single definition to curriculum is difficult. Curriculum serves as a body of knowledge to be transmitted. It is also viewed as a process, and as praxis (Llewellyn, 2009). If there is a common strand that runs through all definitions of curriculum, it is that, curriculum represents a course or guide of study to be run. Curriculum reform is defined as bringing changes to the subject content, delivery, and assessment of curriculum. It may be reform of the mathematics curriculum, science curriculum, reading curriculum of whole language versus phonics, or the approach to literacy and numeracy (Llewellyn, 2009).

Mathematics Teacher Education Programme in Nigeria

One of the basic truths in education is that, the quality of mathematics education depends largely upon the quality of the mathematics teacher produced. Whether the mathematics teacher is seated at one end of the proverbial log with the student perched

at the other end or whether the teacher is in the best equipped classroom of the most up-to-date school, with the best state of the art. Whether the teacher is at work with a small number of students or is on a television screen that is viewed by a large number of students or whether the teacher is what is seen in computer programmes or programmed text books. There is the likelihood that the students will not get quality education unless the teacher is qualitative. Therefore, whatever input is made into an educational system in respect of management, resources, facilities and array of instructional materials, will be of little avail if the teacher is unskilled, poorly trained, or even ignorant (Mukhtar, n. d.).

There are many area of specialization in teaching today with wide range of required skills and knowledge. This implies that teachers need to be well prepared to a degree for the different teaching functions and challenges. This point to the fact that for effectiveness, mathematics teachers need to be given a professional education that will qualify them thus, as well as enable them to effectively perform the task of giving the appropriate support towards enhancing a virile and qualitative system of education in any nation. The teacher education is the foundation of quality in the educational system and this is the key to unlock all facets of development. This is very relevant in nations that look up to education as a vehicle for attaining the desired development in all sectors of national life (Mukhtar, n. d.).

The concern of mathematics teachers' education world over is the training and preparing mathematics teachers for effective functioning at the school. Teacher education has therefore been defined severally. Teacher education mean the form of education which is planned and systematically tailored and applied for the cultivation of those who teach or will teach particularly but not exclusively, in primary and post primary levels of schooling (Okafor, 1988). Mathematics teacher education is the professional training programme that mathematics teachers receive for them to be classified as professionals (Okafor, 1988).

Being the training arm of the teaching profession, teacher education is charged with the task of developing knowledge and skills as basis for practice, with preparing personnel entry into the teaching profession (pre-service) and with contributing to the ongoing development of practicing professionals (in-service). Mathematics teachers' education is therefore to function by equipping mathematics teachers with the wherewithal; both ethical, intellectual competencies and skills, dispositions, emotional and so forth, that will enable them develop and imbue in their students the requisite educational and societal dispositions (Ipaye, 1996). The quality of any educational system therefore solely depends on the quality of the teachers one finds in the school system.

Curricular Reforms in Mathematics Teachers' Education in Nigeria

Education is the constant transmission of ideas and values for the development of the whole man in relation to the dynamic needs of any particular society (Odogo, 2012). It embraces not only the deliberate processes of schooling but it includes indirect and

incidental influences exercised on the child. According to Odogo (2012), in present day Nigeria much emphasis is being placed on technological development. Consequently, students are being encouraged to take up science related subjects. One subject that cuts across all sciences is Mathematics. This is so because, Mathematics knowledge pervades literally every field of human endeavor and play a fundamental role in economic development of a country (Akinsola & Tijani, 2009). According to Adewumi (2012), in the match towards scientific and technological advancement, there is need for a good performance by the students in Mathematics at all levels of schooling.

In answer to the above need, the Federal Government of Nigeria (1998) recognized the importance of teachers in the achievement of educational goals at any level by stating that "no educational system can rise above the quality of its teachers". The teacher is the key factor in determining the quality of education given in schools. Hence, attention is given to curricula reforms in Nigeria. Within these reforms, between the year 1969 and 1972, modern Mathematics programmes were introduced by the government into some classes of primary and secondary schools viz –a– viz the traditional Mathematics courses such as Arithmetic, Algebra and Geometry.

The coming of the missionaries into Nigeria in the 1840s according to Fafunwa (1974), marked the beginning of the development of modern western education. Right from its inception, the missionary education which much later metamorphosed into western education, the need for teachers became obvious. The quality and quantity of teachers being churned out from the mission houses through the tutelage of pastors and reverends in charge of the various church denominations was simply not enough. According to Mukhtar (n. d.), the Church Missionary Society (CMS) established the first Teacher Training Institution in Abeokuta, Western Nigeria, in 1859. The Baptist Mission also founded the Baptist Training College, Ogbomoso in 1897, with the Wesleyan Mission establishing the Wesley College in Ibadan in 1918. In the Eastern part of Nigeria, the Hope Waddell Institute was founded in Calabar in 1892. Later in 1909, the then Colonial Government established the Nassarawa Schools in Northern Nigeria. Katsina and Toro Colleges were later established in 1927 and 1929 respectively.

The Church Missionary Society (CMS) during the colonial era also set up Teacher Training Institutions in Lagos and Oyo states. The Grade III Teachers certificate was the qualification most of these Institutions award. Later on, Teachers Colleges awarding the Grade II sprang up. The Grade I Teacher Training was later introduced by the Teacher Training Institutions and aspired by ambitious teachers willing to enhance their status to qualify for teaching in Secondary Schools. The earliest curriculum for the early teacher training consisted of subjects like; English, Arithmetic, Writing, Geography, Hygiene, General Studies, Geometry, Agriculture, Nature Study, Local Languages.

The Ashby (1960) commission report however observed a lot of anomalies in the then colonial education in Nigeria, including the Teacher Training Programme that was seen to be highly inadequate. Many teachers were un-certificated and improperly trained

(Ashby, 1960). This resulted in the recommendation for massive expansion of intermediate education for teachers aimed at upgrading the existing teaching force. This brought about the existence and emergence of Advanced Teachers Colleges, and which later metamorphosed into Colleges of Education. The first of these Advanced Teachers Colleges designed and established by the Federal Government with the assistance of UNESCO, were meant to produce well-qualified non graduate teachers for secondary schools to replace the older well established Grade II Teachers who were not qualified to perform the task (UNESCO, 1996). The scheme provided mathematics teachers with the NCE (Nigeria Certificate in Education), that are of good quality and the right quantity to meet the educational needs as at that time. The number of these colleges gradually increased to cater for the expansion in the demand for education and qualified teachers.

As at 2003, there were 68 Colleges of Education owned by the Federal and State Governments, privately owned and also by the Military. There is one such College designated for women only and one for Special Education as well as Colleges of Education Technical. These Colleges award the NCE certificate with some of them upgraded to award Bachelor of Education (B. Ed.) degree of affiliate Universities. The duration of the NCE is usually three years for the full time students, while the part time students spend upwards to five years to complete their programme of studies. Universities established prior to independence, at independence and post independence, also provided mathematics teacher education programmes. Established Faculties of Education and Institutes of Education in these Universities, Federal, State, Private and Military, provided professional training for teachers. With many of the Universities awarding Bachelor of Arts (B.A.), Bachelor of Science (B.Sc.) Education, Masters in Education (M.Ed.) and Philosophy of Education degrees.

Similarly, the National Teachers Institute also provides professional training leading to the NCE by Distant Learning. Other institutions mandated to provide mathematics teachers' education included the National Institute for Nigerian Languages (NINLAN) and National Mathematical Centre (NMC). However; the Colleges of education are the sole providers of the bulk of the professionally trained mathematics teachers in Nigeria (UNESCO, 2005). The number of Universities and College of Education offering mathematics teacher education prgramme as however increased during the last few years.

The Nigerian National Policy on Education is the document that states the philosophy of Nigerian education. The same document also stated the goals of other components of the Nigerian educational system including mathematics teacher education. The policy (FGN, 2004) gave the following as the goals of teacher education as follows: (a) Produce highly motivated, conscientious and efficient classroom teachers for all levels of our educational system; (b) Encourage further the spirit of enquiry and creativity in teachers; (c) Help teachers fit into social life of the community and society at large and enhance their commitment to national goals; (d) Provide teachers with the intellectual and professional background adequate for their assignment and make them adaptable to

changing situations; (e) Enhance teachers' commitment to the teaching profession. The policy went further to state that, all teachers in educational institutions shall be professionally trained. Teacher education shall be structured to equip teachers for the effective performance of their duties. Since no education system may rise above the quality of teachers, the policy pegged the minimum qualification for entry into teaching profession to be the Nigeria Certificate in Education (NCE).

The Nigeria National Policy on Education (NPE) did not only state the objectives of teacher education, but the NPE (2013) further elaborated on the curricular and Minimum Standards for the NCE as designed and developed by the NCCE. The NCE is the minimum qualification that is required by the practicing teacher, is also the most widely sought for qualification by teachers in Nigeria. And all the Colleges of Education in the country offer a uniform curriculum for the trainee teachers. This therefore ensures uniformity in both standard and quality.

The periodic curriculum conferences and reviews organised to assess all the courses taught in these Colleges, as well as the accreditation exercises by the NCCE for all the colleges goes an extra mile to give a definite quality and standard to the programme of mathematics teachers' education in the country. Deriving a uniform standard for professional training for teachers as pointed out by several authors like Stinnett, (1962); Lassa, (1996); Nelson, Polanski, & Carlson, (2000); Obanya, (2004), is important. Emphasizing this, Mukhtar (n. d.) submitted that, the standard for mathematics teacher preparation should encompass the following four fundamental areas: (a) General Studies (b) Professional studies, mainly elements of philosophy, sociology, as applied to education, comparative education, school administration and methods of teaching various subjects or educational technology. (c) Studies related to mathematics. (d) Teaching practice. The duration of the National Certificate in Education (NCE) is three years for the full time students and five years for the part time students.

There are however arguments suggestions on the imperative need to make the programme of four year duration for the full time students. Basically, a student is expected to take a number of courses that constitute the following number of credit hours in the following category of subject areas; (a) General Education 36 units: - These include courses in the broad areas of Educational psychology, Foundations of Education, Curriculum Studies, and Special Education. (b) Mathematics 36 units: - Here students are to take courses in the areas or subject disciplines that they are interested in and competent to study as their first teaching or main teaching subject (mathematics). (c) Secondary or Minor Teaching subject 36 units: - Students select a minor or subsidiary teaching subject to be studied with the main or first or major subject (mathematics). There are accepted and approved subject combinations from which students make their selections. (d) General Studies 14 units: - The students are given a selection of courses to improve their overall general knowledge in language and communication, ICT, science and society etc. (e) Teaching Practice 6 units: - This is the practical and professional component of the entire programme.

Students are expected to be on a practical teaching that will expose them to the practice of all the theories and principles they have learnt in class. The students are to stay away for a period of twelve weeks for the teaching practice during which they will be supervised regularly. The number of visits to the students is expected to be six. (f) Project 6 units: - the students are expected to complete an individual or group research project in a problem area of their choice and interest in either education or their teaching subject. Already the students had been exposed to a theoretical class of research methodology. At the time of graduation, a student is expected to have taken 130 units or credits to obtain the National Certificate in Education (Mukhtar, n. d.).

Teaching traditional Mathematics and modern Mathematics concurrently brought about the problem of choice among schools, teachers, students, parents/guardians, governments and the consumers of the products of school, and the general public (Idehen, 2009). The Federal Government had to intervene by organizing a national conference on the teaching of mathematics in Nigeria schools. Recommendations from the participants resulted into the development of Mathematics curricula used in our schools across the levels (Odogo, 2012).

Conclusion

The mathematics teacher is important in the scheme of developing the educational potential of any nation. Therefore, educating the mathematics teacher for effective performance of his responsibility of educating the larger members of the society cannot be overemphasized in Nigeria. That is perhaps one of the reasons why the issue of providing the best crop of mathematics teachers in Nigeria is taken very seriously. This is indicated in the efforts made at regular intervals to update and improve the programmes for teacher education through curricular reforms that involves all the practitioners in the industry. But also, the quality control mechanisms put in place by the supervisory bodies, the National Commission for Colleges of Education and National University Commission in ensuring that all Colleges and Faculties of Education in the country are able to provide not only the minimum standard in terms of course content, but also in terms of admission of students, quality of academic staff, facilities, and certification of students. The regular accreditation of all the Colleges and Universities provide an opportunity for bench-marking, reformation, innovation, changes and improvement as well as a quality control assurance for mathematics teacher education programmes in Nigeria.

Recommendations

In order to achieve a successful curriculum reform in Mathematics teachers' education, the following recommendations are made.

1. Since the teachers are those who decide the fate of any educational enterprise, their feelings, perceptions and attitudes must be recognized by the curriculum planners and policy makers before ever any innovation is being launched.

2. Researchers into curriculum reform should look more closely at mathematics teachers' views as a significant mediator in curriculum implementation.
3. During mathematics teacher preparation program, teachers' pedagogical knowledge and beliefs as well as the context in which these teaching behaviors occurred should not be neglected.
4. For an effective curriculum implementation, the discrepancies between mathematics teachers' opinion and ideas underpinning a curriculum innovation should be identified, analyzed and addressed.

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