PROFESSIONALIZATION OF MATHEMATICS TEACHING AND LOW STUDENTS' ENROLMENT INMATHEMATICS TEACHER EDUCATION

Muawiya Haruna Usman

Mathematics is a basic requirement for obtaining admission into higher institutions in the pure and applied sciences, engineering and medicine. It is also the most basic requirement for the attainment of technological self-reliance by any people. But the enrollment of the subject by students in Nigerian teacher education programmehas been very low over the years. This has consequently affected the quality of teaching and the professionalization of mathematics teaching. The major causes of this low enrolment in mathematics teacher education and the strategies for teacher's professionalization was considered. Recommendations arising from the discourse were proffered.

Introduction

Teachers are the key driver in the quest for an effective and sustainable educational development of any nation. The teacher's centrality in teaching and learning has made most of the problems of the education sector to impinge critically on him (Idakwoji,2008; Rafindadi,2014;Idakwoji,2015). The springing up of schools, both by the missionaries and the colonial government necessitated the establishment of training schools where prospective teachers would be taught the science of teaching and learning (Osuji, 2009) In retrospect, the majority of teachers employed by the missionaries and colonial government were untrained. The issue was a prominent focus of Ashby Commission report on „Investment in Higher Education" in 1960. Lord Ashby – an educator per excellence and one time

Vice Chancellor of Cambridge observed that; „the quality of teachers at the primary and secondary level is poor" and „great majority of teachers have neither enough general education to qualify them to teach, nor adequate professional training". The situation was very critical during the missionary era. Pupils in higher classes were used to train pupils in lower classes in the same school. The senior ones were taught in the morning while the senior turned to junior ones from noon till closing hours (Adeyinka, 1971; Fajana, 1978; Akinkungbe, 2011). With more commitment from the government, and pursuant to implementation of Ashby report, the country witnessed a substantial improvement in training and focus on professionalism. According to National Policy on Education (2004), the goals of teacher education in Nigeria are to; produce highly motivated, conscientious and efficient classroom teachers for all levels of our educational system; encourage further the spirit of enquiry and creativity in teachers; help teachers to fit into social life of the community and the society at large and enhance their commitment to national goals; provide teachers with the intellectual and professional background adequate for their assignment and make them adaptable to changing situations; enhance teachers" commitment to the teaching profession.

The indispensable role of the teacher in the teaching and learning process has been well documented in a number of studies The teacher among other things is:

- A role model within and outside the school (Makinde,2005)
- A parapsychologist and counselor (Oyeleke et al,2013)
- A motivator and trailblazer (Makinde,2005)
- A surrogate parent to learners under his tutelage (Udo,2003)

- A leader, supervisor and an administrator(Oyekan,2000)
- A community spokesman and an harbinger of community values(Oyeleke*et al*,2013)

It is at this beehive, that the professionalization of teaching and indeed mathematics teaching has been at the front burner among science educators, professional bodies and government in recent times.

What is professionalization?

Yusuf, Afolabi, &Oyetayo (2014) defines profession a as an occupation or vocation that requires special skills, knowledge of some department of learning and qualification to especially one with high social status. It is a job that requires special skills or knowledge through special training with a high level of education; and it utilizes functional education and mental ability rather than manual or physical labour. According to Dada&Fadokun (2010), a profession entails an occupation that is dependent upon specialized intellectual study and training for the provision of skilled service to other member of society; government, nongovernmental agencies for a definite fee or salary. Orubite (2010) posits that a profession is a paid job that requires prolonged training and liberal or formal educational qualification. TRCN (2005), attests that professionalism guarantees that ethics are imbibed, the rules of the game exist and are obeyed by all, clients get value for their money and efforts, public interest is protected, priority is given to nation building, and above all that the professionals are regarded with dignity and awe.

NTI (2007) defined profession as any occupation which demands of all who work in it a prolonged and specialized knowledge, skills, and attitudes that are necessary for providing a particular service in the community. Adesina (2005) viewed that professionalization refers to building into teaching career some control device to ensure that the practitioners are worthy members of the profession Okunloye (2005) defined a profession as a symbol for a desired conception of one's work and by extension of one's self (the worker). Oyekan (2000), defined professionalization as a process involving improvement in the status and practice of the occupation as the practitioner continually upgrades the knowledge, skills and attitudes required for effective and efficient professional practice. The writerposit that in attaining professionalization for the mathematics teacher, the need to synchronize and perhaps jealously and zealously guard teaching from meddlesome interlopers cannot be overemphasized.

A milestone for teacher professionalization in Nigeria has been recognized, appraised, echoed and re-echoed as a collective desire in the National Policy on Education (NPE) (2013) where it is clearly started that teaching, like other professions, will be recognized as a profession. The Teacher Registration Council of Nigeria (TRCN) was established by Act No 31 of 1993 to regulate and control the teaching profession which in the writer's view has been up and doing.

In spite of the numerous policies and legislation in place, the profession as it stands in Nigeria is still bedeviled with a number of challenges that appears insurmountable. For instance, Akinduyo (2014) and Fareo (2015) in their studies enumerated the various categories of challenges confronting the teaching profession. They include: Low wages, bad

motivation and poor welfares Irregular self-esteem in the society Absence of education professional academy Negative reinforcement which is doing the profession no good. Lack of professional and in-service trainings Low professional status High teacher –pupil ratio Ineffective machinery to enforce the code of conduct in the teaching profession. Politicizing education Lack of autonomy by Nigeria Union of Teachers (NUT) Poor budgetary allocation to teaching profession Poor work environment (e.g. infrastructures amenities etc.) Government's inability to register NUT as a profession organization Massive unqualified staff. Porous entry qualification Non-involvement of teachers in decision-making process The State control of staff personnel services for teachers Fragmentation of teachers into many different associations like Nigerian Union of Teachers (NUT), Conference of Primary School Head-Teachers, the All Nigerian Conference of Principals of Secondary Schools (ANCOPSS), Committee of Provosts of Colleges of Education, Committee of Vice-Chancellors of Nigerian Universities, Association of Classroom Teachers, Science Teachers Association of Nigeria (STAN) Social Studies Teachers Association of Nigeria (SOSAN) and other teacher organizations. Yusuf *et al*(2014) and Nwosu(2017) in their separate studies listed a number of strategies for the full professionalization of teaching to include:

- **Government Strategies of full Professionalism** The government must ensure immediate commencement of work by the recently established Teachers' Registration Council of Nigeria. As the National Teachers Registration Council has been established through the enactment of Act No 31 of 1993, this national body should be assisted by the State Teachers' Registration Council in every State of the Federation, to be charged with the responsibility of teachers' registration, accreditation, certification, promotion, development, discipline and making regulations to control the practice of teaching as a profession. The categorization of teachers was also suggested.
- **Teachers' Organization for full Professionalism** The teachers' organizations must be fully represented and actively involved and must work relentlessly to safeguard the autonomy inherent in the status of teaching as profession. They must strictly enforce members' compliance with professional codes of ethics.
- **TRCN Strategies of full Professionalism**: TRCN can catch young teaching professionals by laying a strong foundation for professional consciousness and commitment through the induction of graduates in education disciplines at the point of graduation.

Low Students' Enrolment In Mathematics Teacher Education

According to Francis Bacon "mathematics is the key of all sciences". Today's world largely depends on science, and science in turn depends on mathematics. People grant it as a theoretical subject. But the truth is all the branches of mathematics were developed to meet the demand of day to day practical life(Pia,2015) Mathematics is a unifying factor for all disciplines in life, being beneficial to the learner, his catchment environment (or discipline) and the world (or knowledge) at large. But surprisingly, students' enrollment of this vital

subject which largely defines the development status of any nation has been on the decline in Nigerian schools over the years. In some schools, there were even no candidates for the subject for some years. At tertiary level some institutions enroll only a scanty number of students in their physics departments, because the few students who offered and passed mathematics at senior secondary certificate (SSC) level, thereafter opt for medicine, engineering and other seemingly prestigious and lucrative fields of study. The problem is one of the reasons why it is difficult to have university graduate teachers of physics, chemistry and mathematics is because the good students of these subjects invariably go in for engineering and medicine (Mbamara and Eya, 2015). In fact, one of the most depressing problems colleges of education in Nigeria face is the perennial loss of good students in the sciences to the universities after one session, not to study education but invariably medicine, engineering architecture or pharmacy (Ukeje, 1986). This is not peculiar to Nigeria, according to Wenning (2002), Samela (2010) and Taale (2011) in their submissions agree that the situation as a universal one, creeping up to university level. This state of affair is unacceptable because in complementary sciences like biology and chemistry, enrollments are comparably higher. For example, the data from the University of Nigeria Secondary School, Enugu Campus, showed that all the 126 students who took the SSCE in 1995 and all the 130 students who took the same examination in 1996 in the school offered biology. The question which then arises is 'What is the reason behind this unhealthy disparity?' At junior secondary school (JSS) level, integrated science which is the prerequisite subject for all the senior secondary school (SSS) science subjects is offered by all students compulsorily. And a look at the curriculum of integrated science from JS1 to JS3 reveals that all the component science branches – physics, chemistry, biology, agricultural science and earth science – are given comparably equal attention and basic introductory presentations. Notably also, mathematics which is complementary to the study and prerequisite to the understanding of physics is compulsory for all students both at JSS and SSS levels. Something therefore seems to be fundamental to the low enrollment of students in mathematics.

In terms of choice satisfaction there is no doubt that everyone enjoys the outcome of the study and knowledge of mathematics. People who offer mathematics as one of their subjects are always happy they did, more so as even their contemporaries in the other branches of knowledge usually esteem them highly, and more so if they are females. Mathematics results are appreciated by all and sundry. Percentage failure in SSCE in mathematics is usually the least when compared with the other science subjects (WAEC, 2014). More so, future prospects for mathematics are even wider than for the other subjects. These facts make one wonder all the more why less people offer mathematics in their choice of subjects. These developments should therefore be points of attraction for most students to opt for mathematics; but alas, the contrary is observed. The effect of this abandonment of physics is more than expressible because it triggers a chain of consequences on our national outlook as a whole. It stalls our technological advancement, leads to inadequate number of mathematics teachers for the present and future generations, leads to a proliferation of the arts subjects and excessive demand for admission and jobs in those areas, while such demands in the area of mathematics remains low and sometimes totally lacking. The

repercussion of the neglect remains prominent throughout life. Such people eventually get frustrated or muddle up things, and this in turn leads to inefficiency, low output, or even disaster. Thus the low enrollment of students in mathematics is an ill-wind that blows nobody any good.

Factors Responsible For Low Students Enrollment In Mathematics Teacher Education Programme

The body of academic literature is replete with a number of factors fuelling low enrolment in mathematics teacher education. Few will be considered in this discourse.

Negative attitude of mathematics means having an aversion towards learning mathematics and using it in their daily life and discouraging students from choosing mathematics as their major subjects. Hostile feelings and negative attitudes toward Mathematics and science, therefore, have a great influence on general behavior and values . These feelings and attitude that sustain a dislike of Mathematics or hamper any interest in mathematics and are great barriers to the development of Mathematical literacy than any lack of particular concepts, skills, or thinking abilities'

Many students develop fear towards Mathematics due to their misunderstanding, non-understanding and failure during previous lessons . That mathematical anxiety is developed as a result of having a poor image of mathematics due to general lack of comfort in that someone might experience. The lack of connections to the use of mathematics and relevance in daily life or in relation to other sciences fosters low motivation and negative attitudes towards mathematics learning and hence the feeling that why learn if it has no use prevails among most students

Often gender difference in attitudes about mathematics have been referred as one factor that has contributed to lower enrolments and less success of girls in compare to boys in mathematics courses (Pia,2015). A number of scholars have noted that Mathematics is perceived as a male domain in various countries

Other factors may include peer group influence, parental influence, poor mathematical background, etc.

Implication of Low Enrolment on Mathematics Teacher Professionalization

The sensitive and crucial issue of teachers' working conditions is at the heart of any examination of the quality of basic education in sub-Saharan Africa. A review of the literature produced since 2000 does indeed confirm that work in teaching has become increasingly insecure, even though teachers are regarded as the mainstay of quality in basic education. The implication of low enrolment in mathematics and teacher professionalization are numerous and interwoven:

1. Lack of motivation. The way teachers are motivated ranging from remuneration package to working condition has not encourage upcoming generation to see teaching as viable profession to indulge. Instead it is seen as a second alternative where all else have failed.
2. Aging of existing human resources for mathematics professionalization. The consequence of low enrolment plays up itself in the lack of personnel or manpower

to bequeath the baton of profession for in the next generation hence there is fosslity of man power for mathematics teacher professionalization.

3. Recurrent trends of mass failure in mathematics for our upcoming generation- As a consequence of low enrolment, today engineers and other allied science find their wayinto our schools and colleges teaching maths without appropriate technique and strategy. This ugly trend lead to mass failure at the beginner's level.
4. Low productivity in science and mathematics- Mathematics is the bed rock of science and the difficulty inherent in low enrolment will no doubt translate to lack of manpower in mathematics teacher's professionalization and by extension low productivity in science and mathematics.
5. Vulnerability of the profession to quacks- Today most persons teaching mathematics in our schools are not professionally competent.Idakwoji (2016) not that minimum teaching qualification, sound pedagogical knowledge and sound disciplinary knowledge were not taken as basic conditions for the engagement of a good number of teachers where they are available.. These basic conditions were usually seen to be overlooked in favor of other considerations by most state teacher employment agencies he further submitted..
6. Frustration in educational policy as a result of gap created by low enrolment of students in maths teacher education which consequently affect placement in Schools.
7. Huge gap between policy and implementation among others.

Summary And Conclusion

In this paper, a modest attempt has been made to discuss the problem inherent in low enrolment and professionalization of mathematics teaching.The factors affecting low enrolment of students in mathematics teacher education was also considered with clarion call on all and sundry to team up with educational and statutory bodies to arrest the ugly trend if the professionalization of mathematics teaching will not go into oblivion. Attempt was also made to review the effort and strategies of learned societies and statutory bodies at professionalization of teachers. This in the writer's view is a step in the right direction but a bold and courageous step is required through appropriate incentives to encourage the study of mathematics which will in turn be a booster to the professionalization of mathematics teaching.

Recommendations

In view of the foregoing discourse, the following recommendations are proffered:

1. Students should start early in life to develop interest in mathematics as a subject. This will make the subject easy for them when they now choose it as one of their subjects at school. Then they would have a comparative advantage over their mates and be happy with their subject choices then and after.
2. Parents should arrange extra lessons for their children in the sciences, particularly in such areas as mathematics which they find somewhat difficult. Verbal encouragement and guidance, even in the absence of everything else, will also help tremendously to put the children in the right track regarding their careers.

3. The teachers on their part should cease to stick to strictly orthodox ways of teaching as it concerns the sciences, particularly mathematics. Less formal approaches should be adopted in order to first and foremost impart a positive attitude and friendly posture on their pupils in relation to themselves and their subjects.
4. School principals and heads of science departments, though operating on tight budget, could still do a lot to tilt the interest of their students towards mathematics.
5. Commendation of teachers' efforts and fruitful dialogs on their problems will also help in bringing out the best out of the teachers. Principals should not hesitate to nominate, recommend and sponsor their mathematics teachers.

References

Adesina, S. (2005) Growth without Development, Nigeria's educational experience between 1914-2004. Abeokuta: Educational industries Nigeria Ltd

Adeyinka, A. A. (1971). The development of secondary grammar school education in the western state of Nigeria 1908-1968. M.Ed. Dissertation, University of Ibadan.

Akinduyo, T.E. (2014). Teaching profession in Nigeria: Issues, problems and prospects. International Journal of Scientific and Research Publications, 4(11), 1-3.

Dada, S. & Fadokun, J.B. (2010) Professional ethics in Teaching: The training and developmental challenge. Online available athttp:www.data.up.ac.za/presentation/ word/dat.pdf. 02/11/2012.

Fajana, A. (1978). Education in Nigeria, 1847-1930: An historical analysis. Longman: Printing Press

Fareo D. O. (2015). Professionalization of Teaching in Nigeria: Strategies, Prospects and Challenges. Journal of Education and Learning, 9 (3), 190-196. [11].

Federal Republic of Nigeria (2013). National Policy on Education. 6th Edition. Nigerian Educational Research and Development Council (NERDC), Yaba, Lagos. P. 23-28. [12].

Federal Republic of Nigeria (2004,2013). National Policy on Education. 6th Edition. Nigerian Educational Research and Development Council (NERDC), Yaba, Lagos. P. 23-28.

Idakwoji, S B (2012). Manpower development in the education sector of the Federal Capital Territory senior secondary schools 1999- 2004 Keffi Journal of Educational Studies 3 (1): 23-34

Idakwoji, S. B.(2016)Issues of the teacher and improved educational achievement in Nigerian schools Education Research Journal Vol. 6(2): 49 – 57.

John, O.A. (2006). Reflections on becoming a teacher and the challenges of teacher education. Inaugural Lecture, Series 64, Faculty of Education, University of Benin, Benin-City, Nigeria

Mbamara,U.S.&Eya, P.E.(2015) Causes of Low Enrollment of Physics as a Subject of Study by Secondary School Students in Nigeria: A Descriptive Survey International Journal of Scientific Research in Education, 8(4), 127149.

Mkpa, M.A. (1997) Curriculum development at Owerri: Totan Publisher Ltd.

Nwosu, J. C.(2017) Strategies for Professionalization of Teaching in Nigeria and the Role of Teachers Registration Council of Nigeria (TRCN)International Journal of Humanities and Social Science Invention, 6(8):55-61.

Okunloye, R.W. (2005). Teaching as a profession in Nigeria: Problems and prospects in I.O. Abimbola& A.O. Abolade 2005 (Eds). Fundamental Principles and Practice of Instruction. Ilorin: Department of Curriculum Studies and Educational Technology.

Orubite, A.K.O. (2010). Acceptable school norms and unprofessional conduct in Nigerian's Schools: Implications for academic standards. A Paper Presented at the Niger Delta Development Commission (NDDC) Organized Capacity Workshop for Secondary Schools Core Subject Teachers in the Niger Delta Region from 19th April-20th May, 2010.

Osuji, S. N. (2009). Teacher Education Curriculum in Nigeria in the Perspectives of Lifelong Education. The Journal of International Social research.vol 2/8

Oyekan S. O. (2000): Foundation of teacher education, Ibadan, Ber Quality Prints.

Oyeleke O., Akinyeye, C. O., Opeloye B. A.(2013) A Critique of Teaching Profession and Teacher Education in Nigeria, International Journal of Humanities and Social Science 3(5);267-273.

Pia, K. F. (2015). Barriers in Teaching Learning Process of Mathematics at Secondary Level: A Quest for Quality Improvement. *American Journal of Educational Research*, *3*(7), 822-831.

Rafindadi, A H (2014). Harnessing the vast natural resources of the North to fund education in the northern states and FCT. Keynote address delivered at the 2014 Annual Lecture/Dinner of the Barewa Old Boys Association, at Dutse, Jigawa State. 30th August, 2014.

Samela, T. (2010). Who is Joining Physics and Why? Factors Influencing the Choice of Physics among Ethiopian University Students. International Journal of Environment & Science Education 5(3). Pp 319340. www.ijese.com/...

Taale, K. D. (2011). Parental and Society Influence on Physics Students' Enrolment Decisions in the University of Education, Winneba, Ghana. Journal of Education Practice 2(4). P2. www.iiste.org/...

Teachers Registration Council of Nigeria (2010). Professional standards for Nigerian teachers, avolaty version. Abuja, Federal Ministry of Education.

Teachers Registration Council of Nigeria (TRCN) (2005). Teacher's handbook. Abuja, Federal Ministry of Education.

Teachers Registration Council of Nigeria. (2011). National Benchmark for PostGraduate Diploma in Education in NigeriaFederal Ministry of Education.

The National Teachers' Institute, Kaduna (2011). The National Teachers' Institute, Kaduna. Britain – Nigeria Education Trust. Available at: https://www.ticketsource.co.uk/thebritainnigeriaeducationaltrust

Udo E. U. (2203): Quality School Learning Environment as a Mediator in the Child‟s Right to Live, Develop and Learn in Ehindero O. J. & F. O.

Aladejana (eds) "Reading in Early Childhood and Universal Basic Education, Accra: Lantern Books, pp. 158 – 176.

Ukeje, B (1995). Teacher education for national development. A key-Note Address presented at The National Commission for Colleges of Education, Kaduna September 28, 1995.

Wenning, C. J. (2002). Easy Come, Easy Go? Journal of Physics Teacher Education 1(2), 1-2. www.phy.ilstu.edu/jpteo/...

Yusuf, M.A., Afolabi, F.O. &Oyetayo, M.O. (2014). Professionalization of teaching through functional teacher education in Nigeria. European Scientific Journal, 10(4). 107-118.

Mu'awiya Haruna Usman is a senior lecturer in Department of Mathematics,
Federal College of Education, Zaria, Nigeria.
Email: muawiyya2013@gmail.com