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SCIENCE, TECHNOLOGY AND MATHEMATICS (STM) EDUCATION: THE ROLE OF MDGs IN PREPARING TEACHERS FOR THE CHALLENGES OF DEVELOPMENT IN NIGERIA

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Abstract

The development of any nation hinges on its Science, Technology and Mathematics Education (STM). So, Nigeria is not an exception in this case. Therefore, for Nigeria to develop emphases have to be given to the teaching and learning of STM in Nigerian schools. Preparing STM teachers for the challenges of development in Nigeria is not a mean task. In this regard, the Nigeria MDGs office has a great role to play such as providing funds and facilities to schools in form of grant in aid, improving the remuneration of STM teachers through performance grants and strengthening the STM teacher training programmes for effective teaching and learning in schools through capacity building programmes. This will assist Nigeria in its efforts at preparing STM teachers for the purpose of surmounting the challenges of development.

Introduction

The World is Science and Technology driven and these consequently made it a global village. These can be seen from the remarkable changes taking place in the society as evidenced by diverse efforts on practically all aspects of human life. It is for this obvious reason that Nigeria has for decades been battling with problems of general development and nation building and has long recognised that the critical element required as a pre-requisite in the development of human and material resources is STM education. It is because of the processes of education that teacher preparation is accorded high priority as contained in the National policy on Education (FRN, 2004). The role of a teacher as summarized by (Okolo, 2005) is such that the teacher in any society lies at the heart of its intellectual and social life and it is through the teacher that each generation comes to terms with its heritage, produce new knowledge and learns to deal with changes, provided that the teacher has been with enough education to act as transforming element. So, a teacher should be adequately trained equipped with teaching facilities so as to impact knowledge to his pupils successfully and effectively in order to achieve the goal of the Millennium Development.

Science, Technology and Mathematics education are important ingredients for attaining the millennium development goals and also for social and economic changes. Therefore, it is imperative for every citizen to attain some literacy if and for government to prepare and motivate STM teachers in schools.

Okoli in Fajula (2003), asserted that, Nigeria like most African countries responses implicitly confidence in the power of STM to solve her from the ravages of poverty, ignorance and disease. These indices most effectively defined the extent to her under development. However, Technology is generally regarded as applied science and it entails the creation of methods, techniques, material goods as well as essential conditions for human welfare.

Mc Connell in Fajula (2003) made clear definition between science and Technology. He said science is concerned with the acquisition of knowledge and explanation of phenomena in man's physical

environment while technology on the other hand is concerned with how such knowledge is utilized in order to make the physical environment serve man better. Therefore for Nigeria to achieve Millennium Developments goals more emphases should be on preparing science teachers to teach effectively in schools and educational institutions through trainings, workshops, seminars and conferences for the proposes of National Development.

The Need for Effective Teaching and Learning for National Development

The need for effective teaching and learning of Science, Technology and Mathematics in Nigerian schools has been highly emphasized. Eze (2006) stated that a sound Science, Technology and Mathematics (STM) education base is undoubtedly a sine qua non for the attainment of functional scientific literacy, which in turn determines the extent to which the citizens of any nation can avail themselves of the benefits of information communication and technology (ICT). Horan (2006) said that in order to keep Nigeria's economy growing, it needs a more of educated students ready for modern scientific research teaching and technical development. Ogbazi (2000) added that science and technology are so fundamental to modern world that it is becoming impossible to comprehend this world, know how to act in it without the appreciation of the social significance of science and technology. A nation that tries to undermine or fails to come to this realization is plunging to her dorm.

The Nigerian Government has come up with a number of Slogans' such as NEEDS, VISSION 20:20:20, SEVEN POINT AGENDER, SAP, YES and so on. It baffles one that even as these issues are promoted in the Nigeria point and electronic media, no critical and concrete arrangements in place to lead help to the materialization of these goals, especially as if pertain to STM education inform of serious and deep rooted reform.

A visit to most public schools in Nigeria brings one close to reality of the poor condition of the schools. The teachers to inculcate the basic knowledge of science, technology and Mathematics are not available and where available, are not enough. The students therefore are not well taught and hence there is low enrolment of students that opt for the sciences in the secondary, universities and other higher institutions of learning. For Nigeria to achieve the Millennium development goals just as the developing countries emphases should be made to improve students' enrolment in STM subjects and also more and competent hands should be employed in educational system to handle the teaching of STM in secondary schools effectively.

STM Teacher's Preparation in Nigeria

Teaching of STM according to Olarewaju in Nsofor (2008) involved some sort of high abstract mental processes such as classifying, measuring, predicting, identifying problems, formulating hypothesis, testing hypothesis, experimenting, collecting data, making inference, drawing valid conclusion and posing further questions for investigation. Most of these processes required abstract thinking and demand relatively high degree of self expression on the part of both the teacher and students. According to Hamilton in Nsofor (2000), the teacher's logical development of a country is more accurately gauged by the quality of its science, technology and Mathematics Education. A developing country like Nigeria cannot afford to play around with its teacher preparation programme, if it intends to raise its level of development of STM in order to achieve the Millennium Development Goals and hence develop. These will be the determinants of the quality of teaching that will raise the standard of learning of STM. The National Policy on Education

(2004) stated that no nation can rise above the quality of its teachers for the production of quality teaching. Therefore, teachers need to be prepared and motivated in order to ensure quality teaching and learning of STM. The teachers in service should be encouraged to attend workshops, seminars and conferences regularly. These programmes should be on all aspects of classroom instruction including modern methods of teaching, use of modern gadgets for teaching STM subjects. This will prepare the teachers and equip them to be up to date with new ideas on development in the teaching and learning of STM in schools. This will help improve their professional skills and current knowledge in their areas of specialization or field.

The government should ensure that professionalization of teaching becomes a reality and special salary should be set aside for STM teachers to attract qualitative individuals into the teaching profession and bring a stop to the present brain drain in order to meet up with the goals of MDG programmes. Therefore, funds and facilities needed for effective teaching and learning of STM should be adequately provided. No teaching and learning can succeed without funds and facilities being provided for the smooth teaching and learning of the subjects. The provision of funds and facilities will greatly prepare teachers to work. However, teachers' registration council must work to make any teacher in any level of education in the country to be registered to ensure self-esteem, and also ensure that teachers at all levels are placed properly (Fuller in Dominic, 2007).

The role of Millennium Development Goals in Preparing STM Teachers for the Challenges of Development in Nigeria

There are enormous challenges for STM teacher preparation for actualizing the aims of Millennium development goals.

These challenges include the following:

- (a) Improvement in the remuneration power of STM teachers.
- (b) Improvement in financial subvention to schools for STM teaching.
- (c) Strengthening the STM teacher training programmes
- (d) Massive provision of STM teaching and learning equipment and infrastructure.

Improvement in the Remuneration Power of STM Teachers

Most STM teachers due to low income in salary preferred to render their services to other professions where better salaries are paid than staying in the teaching profession, hence those in the teaching profession look out there for survival and therefore have little or no time to concentrate in imparting knowledge to the students. This constraint affects the teaching-learning process because students will not be given full attention and hence resulting in the mass failure of students in STM subjects. In order to avoid mass failure of students, scholarship and service training with pay should be granted to STM teachers. Promotion and salary increment should be given regularly to STM teachers in order to achieve the Millennium Development Goals.

In addition, subsequent workshops and seminars should be organized for teaching STM to brace teachers up with new discoveries, new pedagogical approaches to STM teaching and learning for achievement of the Millennium Development Goals. Therefore, preparation and admission of students into the teaching profession should be improved to ensure that committed, dedicated and interested STM teachers are produced to avoid one-leg-in, one-leg-out of many STM teachers from teaching services. Finally, in order to retain competent and capable hands to teach STM subjects in schools, the condition of service for teachers

should be comparably better than that of civil servants for the attainment of the Millennium Development Goals.

Improvement in Financial Subvention of Schools for Effective STM Teaching

For Nigeria to achieve the Millennium Development Goals, Federal and state governments should increase the federal subvention of both primary and secondary schools to improve the teaching and learning of STM. There should be capacity building of STM teachers in the primary, secondary and tertiary institutions. This should be in a way of retraining teachers to acquire basic skills and competence on how to make teaching and learning meaningful and enjoyable. This can be done by government sponsoring STM teachers to attend seminars, conference, workshops and so on, on the basic skills needed on how to use and also handle old and latest instructional materials needed for the teaching and learning of STM subjects in Nigerian schools for the achievement of the Millennium Development goals. Conducive environment should be provided by State and Federal Government for effective teaching and learning of STM subjects in order to achieve the goals of the Millennium Development in Nigerian schools system.

Strengthening the STM Teacher Training Programmes in Nigeria

Training and retraining of STM teachers should be a serious business of federal and state government and also donor agencies, like UNICEF, UNESCO, and NUT and so on to prepare STM teachers and also to develop interest in the teaching and learning of STM subjects so as to increase the performance of students in STM subjects. Therefore teachers training institutions should train the STM teachers in practical and demonstrate teaching of various concepts in STM to equip the STM teachers with the challenges they will face when they start teaching. This will make them have confidence in themselves and in the knowledge that they will impact to the students. Therefore STM teachers are challenged to change their attitude positively and devise a suitable means to impact the knowledge of STM to the students in order to boost the performance of students in STM subjects at SSCE WAEC/NECO Examinations in Nigeria schools for the achievement of the Millennium Development Goals.

Massive Provision of STM Teaching Equipment and Infrastructure

It is true that science, technology and mathematics skills and knowledge are acquired and developed from many different contexts like the media, museums of various kinds and in everyday life activities. Most of the impressive skill that young people have in handling personal computers, the internet, cellular phones and all sort of electronic devices are acquired informally outside the school settings, what one should expect is on urge to actually learn about the theories underlying these appliances by enrolling into STM education in the schools. The challenge is how to sensitize students into enrolling into STM education. Therefore it is a challenge to STM teachers to sieve out the particular method of instruction that will make students to be more interested in the learning of STM in the school; these can be done by providing basic STM facilities in primary, secondary and tertiary institutions such as good STM libraries, well-equipped laboratories, and qualified teachers in the area of STM and the use of appropriate methods of instruction for the attainment of the aims and objectives of the Millennium Development Goals. However most instruction in STM classroom seems to be barren and uninspiring this poses a central responsibility on the STM teachers. Hogon (2000) stated that the STM teachers should therefore create situations that give much room to increasing the students stock of experiences and concept that will enable him/her progress. This is to say in

STM teaching the teacher should adequately encourage the students to form the right concept early enough before the instruction proper. Although many students do not have interest in STM subjects, for that there is low enrolment in the number of students registering them in the external examination such as SSCE WAEC and NECO as well as offering to read them in the university and other higher institutions of learning. Those who have interest in the subjects prefer to go in for medicine, engineering or other professional course. This low enrolment leads to low production of man power in STM areas. Therefore the federal and state governments should equip all institutions of learning with STM facilities in order to achieve the aims and objectives of the Millennium Development goals in Nigeria school system.

Conclusion

A developing Country like Nigeria cannot afford to play around with its teacher preparation programme if it wants to attain the Millennium development goals and also if it intends to raise its level of development of Science, Technology and Mathematics Education and hence develop. Since teachers are the determinants of the quality of teaching that will raise the standard of learning Science, technology and Mathematics in educational system. Again the National Policy on Education (2004) stated that no nation can rise above the quality of its teachers. Therefore, STM teachers should be motivated and well prepared for the challenges of development in Nigeria in order to achieve the Millennium development goals.

Recommendations

1. The Federal and state Ministries of Education has done a lot in their commitment towards the enhancement of STM Education in Nigeria. However, more is needed and expected in terms of human and material such as more experts in STM education to handle STM teaching in schools and to head the affairs of STM education in the head Quarters and Zonal levels. There is need for more financial efforts in the development of both curriculum and instruction programmes.
2. The agencies such as Colleges of education, Universities, National Teachers Institute (NTI) etc who are concerned with STM teacher preparation should give more emphases on the programme of Teacher Education in area of Research particularly action research so that they can observe and report on how there practices (Methodology) are transferred into actual teaching. This is because research experience has the potential to generate motivation which is relevant to the professional practices of teachers.
3. On a regular basis, workshops and seminars should be organised by agencies such as NERDS, NIT, MDGs, another professional Associations such as MAN and STAN. This would expose the participants to current information and their uses for the attainment of the Millennium Development Goals.

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