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An appraisal of science teacher education programme in Nigeria for sustainable development

Ovute, A.O.^{1*} and Ovute, L.E.²

¹Department of Science Education, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria

²Department of Education Foundation, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria

*Corresponding author

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A B S T R A C T

The paper appraised the science teacher education programmes in Nigeria. An attempt was made to highlight some efforts made the government towards realising the objectives of science teacher education at the primary, secondary as well as tertiary levels of education. Some problems associated with science teacher education at each of the levels were also discussed and the implications examined. Finally, recommendations were made towards ensuring an effective science teacher education for sustainable development in Nigeria {Eastern COEASU Journal of Teacher Education, September, 2002.

Introduction

Problems of quality Science Teachers in Nigeria seemed to be acknowledged among science educators and general public (Ivowi, 1997) Baja, (1996) once said "it is not enough to worry about science teacher education in Nigeria, we must rethink it all over from the standpoint of knowledge and experience."

Teachers need all the exposure both in breadth and depth to sciences, which represents the basis for which they are called science teachers. The competence of those who teach sciences in our secondary schools is of great importance to the public, the teaching profession and to all who are engaged in preparing teachers. There is no

doubt, that science teaching deserves members who are intelligent, reflective, sensitive, emotionally stable and whose personal strengths are very much enriched and extended by a vigorous, professionally relevant preparation programme. As McDonald (1978) puts:

"Goals for all quality teacher preparation programmes, regardless of the training institution must reflect reality and aspiration by providing to teacher candidates the knowledge and skills to survive in schools as they are and the professional wisdom and dedication to help schools become more nearly what one would wish them to be".

It is important to note that acceptance of realistic goals does not mean neglecting the ideal situation. The view of teacher preparation as either content or method has always been contrived, for every effective teacher possesses knowledge of the subject to be taught as well as pedagogical skills.

With little disagreement on the inadequacy of science content and the competence of teacher charged with the teaching of science subjects, the need to search

For a means of improving the competence of those seeking to enter the teaching profession as well as those on the job is liable. After all, the education and professional performance of a science teacher are very much affected not only by individual qualities but also by the nature of the preparation programmes. These preparation programmes are the most critical determinants of quality in education. Schools cannot improve their effectiveness and quality except where the teacher preparation programme is run to conform to present reality of the science.

The realization of this role of science was translated into developing and introducing science curricula in our schools. Unfortunately, the interest in the role of science could played in our society as evidenced by teaching science began to fade. The reasons for this are not farfetched. The leadership guidance needed for sustaining a well-run science education programme was lacking. Science programmes introduced in schools existed in name only as many of them were not implemented. Crash programmes in science for prospective science teachers had no impact. For years, students who enrolled in science education programmes found that they did not acquire more than facts in

science. Above all, the difficult conditions that existed prior to the introduction of science in Africa have remained. Science education has a lot to do for its role to be felt in our society.

The role of science in our societies can be achieved if the objectives of science teacher education are achieved. The science education objectives; acquisition of factual science information, the development of methods of thinking and testing thoughts, induction and application of science principles and formation of positive attitudes toward science, from the bedrock for grooming our future science teachers, scientists and technologists. Based on the above premise, an appraisal of the present status of science education programme in Nigeria was considered necessary for ensuring sustainable development in Nigeria.

Status of science teacher education programme in Nigeria

Science teacher education programme in Nigeria is appraised from status of science education in the various levels of formal education:

Science teacher education at primary school level: In Nigeria, various attempts were made to improve science teacher's education programme for primary school level. For instance, the study of science was made compulsory for teacher trainees in 1986; Primary science was introduced as a distinct discipline in which teachers specialised in some Colleges of Education and Universities. These efforts notwithstanding, observations and research results, on primary science education in Nigeria seem very discouraging. Eze (1995) observed in respect to primary science core curriculum in teaching, continued use of teacher-centered lecture method; neglect of

relevant research findings in primary science among others.

Added to these problems are the lapses in the primary science teacher education programme as evident in the poor quality of science teachers in Teacher Training Colleges (T. T. C.), non-availability of science laboratory facilities and insufficient time allotted to science teaching training colleges (Olotu, 1985). It could then be concluded that primary school teachers are ill trained to teach science in Primary School. The fact that the primary school teachers are subject generalists, that is, every teacher teaches all subjects offered in the school including science further reduces the primary school teachers' competence in primary science teaching.

Science teacher education at secondary school level: At secondary school level curricula for the science subjects were developed and adopted for use at the relevant levels of secondary school. Almost all the Universities, Colleges of Education and some Polytechnics are involved in science education programme for the secondary school. Evidence abound that the teacher education programme is defective. This is because the most important component of science teaching, which is the professional aspect, is given negligible emphasis in the form of special method course in most science teacher education institutions.

For two or three credit units to be assigned to science special method course for the entire period of the programme with less than ten weeks of occasionally supervised teaching practice, suggests that the science teacher education programme does not sufficiently prepare the pre-service teacher for secondary school science teaching.

Science Teacher Education at Higher Education Levels: At higher levels-there are many Universities and Polytechnics in the country, which are established train middle level manpower with techno-scientific background. Most of those universe are involved in the training of high level science educators for the teaching of science at the lower levels of education. Several colleges of education are also available in Nigeria that play complementary role of training of middle level science teachers for the teaching of science at the Junior Secondary School and Senior Primary levels of education.

These various levels of tertiary institution in Nigeria actually lack fund, which makes it very difficult to pursue the aims for which they were established. For instance, the science laboratories are so empty of facilities that meaningful scientific research students and staff are not taking place. This results in the teaching of science using methods, which do not inculcate the desired scientific culture to the would-be-science teachers.

Further, the contents of science taught in the universities do not seem to be of much relevant, as they do not tend to address the socio-cultural and economic needs of the average Nigerian citizen. According to Owosoye (1987: 61), the type of science needs in Nigeria should be such:

*that students may understand and have awareness that the rocks are stones below us, the thunder and lightning that frighten us'are no longer messengers of the gods nor the abode of spirits, but matters and materials to be studied and be used for the good of man**'*

The strange nature of the content of science and the adopted inappropriate teaching

methods in science have continued partly to students apathy in the science as had been reported in journals and books. The contents have no bearing with the expected experience at the primary or secondary levels of education.

Indeed, science teacher education programmes in Nigerian universities stand isolated in a sea of problems created at an earlier stage of our science education processes (Ali, 1998). There is no steady flow of sufficient numbers of highly qualified secondary school science students into the science teacher education programmes of many universities and tertiary institutions. Of the few number that enrolled in the science education programmes, academically well-prepared students are in the minority. For example, Ali (1998) noted that most of those students who opt for science education in universities are often those who had poor grades in school certificate or who could not gain admission into medicine, pharmacy, engineering and so on.

The science education teachers in most universities and colleges of education in Nigeria are also faced with some problems which include lack of basic equipment and facilities, poor prepared students, the emphasis on producing journal papers at the expense of teaching and sometimes lack of office space, housing and stationer. Perhaps, if the problems posed to the science educators at the university and tertiary levels were not so numerous, they would be able to help students develop solid background in science and train students in the production of teaching materials and equipment necessary to meet the demands, interests and abilities of the students in Nigeria schools for sustainable development.

From the discussion so far, it is evident that

several varied problems ranging from inadequate funding, lack of science laboratories facilities, poorly prepared students, publish or perish syndrome in expense of teaching; low enrolment of qualified science candidates, insufficient course allotted to science -contents among others are associated with science teacher education programme in Nigeria.

Implications of the status of science teacher education programmes in Nigeria for sustainable development

From the foregoing, it has been shown that the status of science teacher education programme in the various levels of education in Nigeria is such that would not lead to the attainment of the set objectives of science education in each of the levels. The conditions stipulated as means through which the science teacher education would be effectively realised are not given adequate attention. For instance, the allocation to science teacher education programme; encouragement of the use of activity based methods in science teaching among others are not done.

It therefore implies that Nigeria may not attain much desired development as and when due, if she depends on the adoption of science teacher programmes as an instrument par excellence for effecting sustainable development (FME, 1981: 5). This is more so in the event of where education courses are given equal if not more weight than the major teaching subjects (science). There is no doubt that what the student teachers should need most are the science courses whether in form of electives or core courses. These are the priorities regarding what student teachers should be taught to do that need to be established.

It is therefore likely that this poor status of science teacher education, -which manifests in graduating of least effective science teachers and ineffective utilisation of the abundant natural resources all of which are indications of a nation yet to develop may not discontinue in Nigeria for now. In recognition of the need for quality in science teacher education programme for sustainable development, the following recommendations are made:

A shift from fewer contents in Education Courses to more contents in science courses by limiting the first and second level students to only the courses. The present number of units allocated to educate to education during the first two years could be utilised by taking more content science courses. Science teacher education programme cannot be described as exhibited quality if it admits and maintain students of low academic potential. Enhance the socio-economic status of the teacher trainers, to motivate them towards accepting the challenges associated with science teacher preparation. Fund and other science teaching facilities should be provided at all levels of science teacher education programmes. The training programme in the colleges for the prospective science teacher must emphasis the practical approach and highlight the applied aspects of the science skills so that the science teachers will be able to make the learning of science in secondary schools an exciting exercise and a worthwhile experience for their students.

Science students in their teacher training institutions must be exposed to some well programmed Basic Mathematics so that they would be able to destroy, before their students the repulsive myth that science cannot be measured by the average student. Mounting of science fairs, workshops and seminars for science teachers of all

categories and organisation of science competition amongst all grades of science teachers and students should be encouraged and generously supported to foster public awareness of the usefulness of science teacher education for all.

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