

PROFESSIONAL DEVELOPMENT OF PRE-SERVICE BIOLOGY TEACHERS FOR EFFECTIVE PARTICIPATION IN THE UNIVERSAL BASIC EDUCATION (UBE) SCIENCE EDUCATION PROGRAMME

Ukpene, Anthony Ossai

Abstract

The paper takes a look at the state of preparedness of some teachers for the task available in the UBE programme and notes that certain curriculum units such as properties of air, exploring the environment using the senses are among others which some serving teachers perceived as difficult to teach. Equally lacking among pre-service teachers was the competence for labeling biological drawings correctly. It is recommended that for the pre-service biology teachers to conveniently fit into the pattern of UBE instruction in the science subjects, they should acquire the competences of associating biological concepts with pupil's socio-cultural practices, paying special attention to premeditated difficult concepts and practical components of their courses.

Introduction

The primary as well as the Junior Secondary School (J.S.S) levels are the lower rungs of the education ladder where children are prepared to begin to develop, unfold and manifest their innate potentials in life. As a result of this, the learning experiences given to them need to be adequately structured, packaged and delivered so that the desired behavioural outcomes might be elicited. In pursuance of this, the Federal Government in 1980, (as recorded in Bdiya 2002), developed a core curriculum in primary science which the Nigerian Education Research and Development Council (NERDC, 1987), believes would achieve the following objectives:-

- i. Lay a solid foundation in science at the primary level by introducing the basic processes of science to the pupils.
- ii. Develop problem-solving skills of the Nigerian child to make him/her self confident and self reliant.
- iii. Develop and sustain the interest of the Nigerian child in science through appreciation, and
- iv. Bring quality and relevance into the teaching of science with a view to laying a solid scientific and technological foundation (p.53)

Following this was the publication of the National Policy on Education (NPE, 1981), where the Federal Government in its philosophy, purposes and general aims of primary education (as cited in Eze, 2001) reiterated its eagerness to recognize the worth of each Nigerian child, prepare him to become a better citizen with a sound basis for scientific and reflective thinking.

Prior to the birth of the National Policy on Education (NPE), the launching of the Universal Primary Education (UPE) in 1976, had been fraught with several problems among which were explosion in the number of school children of school age enrolled reaching a total of 8.2 million, inadequate qualified teaching and support personnel as well as dearth of instructional materials due to gross underfunding (Ityoban, 2001). The re-launching of the programme on 30th September 1999, in Sokoto by Chief Olusegun Obasanjo, as a Universal Basic Education (UBE) programme was to relive the dream of "removing all the obstacles to life-long education for millions of Nigerians who otherwise would be denied the opportunity of education" (Adeniran, 2000). Designed to be non-fee paying, the UBE in the Federal Government blue-print was envisaged as the foundation for sustainable long-life learning enterprise capable of providing reading, writing and numeracy skills, through a variety of formal, non-formal and informal learning strategies. Chief Obasanjo (2000) in Dakar, Senegal, in his address at the World Education Forum titled "Education for Africa in the 21st Century" succinctly puts the objectives of the UBE as follows:-

- To develop full awareness of the cardinal importance of education in nation building
- The provision of free, universal basic education for every Nigerian child of school going age
- To reduce drastically the incidence of dropout from the formal school system through improved relevance, quality and efficiency.

- To cater for children, who due to unfortunate circumstances may have interrupted their schooling; to inculcate ethical, moral and civic values needed for laying a solid foundation for life-long learning.
- To encourage the development and the use of all the facilities of man through the acquisition of appropriate vocation and technical skills (p. 7).

For Adedigba, (2001), the re-launch of the UBE signaled the commencement of a carefully thought out programme of restoration in the education sector; wholistic and focusing on all-round development of the human potential with strong emphasis on skill training and acquisition either for persons who had left school before the completion of their training for varied reasons, or for persons who needed to upgrade their knowledge and skill, achieved through the out-of-school non-formal programme. (Iji, 2001).

Travails of Teaching the Biological Components of the UBE Science Programme

Teachers are the key elements in the development of learning experiences in the UBE. Iji, (2001), had noted that they are the custodians of the implemented curriculum of education. He also opined that any planning and investment in education that travails the role of teachers will be fraught with disappointing results. Today, the teaching profession is bedeviled by a comparatively declining enrolment into tertiary teacher institutions of learning and teacher education departments in Universities, declining quality of instruction and enhanced infrastructural decay due to poor funding. Consequent upon this is a poorly motivated potential workforce that is equally threatened by the scourge of mass graduate unemployment after leaving school. Adedigba (2001) sums it up that available infrastructural facilities, teaching and non-teaching materials as well as qualified teachers are grossly inadequate for a successful implementation of the UBE programme in Nigeria.

Agogo, (1988), as cited in Agogo and Utoboro, (2001), had taught that poor science teaching was a legacy of the past. They however, regretted that the situation was now getting worse due to the explosive expansion of the primary and secondary education in Nigeria today. They identified simple properties of air, exploring the environment, modeling, using senses, shapes and colours, activities with mirror, and some other activities on animals as some topics which some primary school teachers perceived as difficult to teach. Soyibo, (1992), also lamented that most pre-service secondary school biology teachers failed to master the basic principles of correctly labeling biological drawings. In addition, the language of communication sometimes constitutes a problem in the effective teaching of the biology components of primary science, especially in rural schools. It is observed that in most rural schools, pupils are taught in vernacular and most teachers find it difficult to translate most of the instructional experiences during presentation. Also, most primary schools and the J.S.S have no functional laboratories, while the pre-service teacher training institutions on the other hand continue to grapple with declining over-head subventions from government which unfortunately portends a gloomy future for the UBE programme. It becomes imperative that the attainment of the goals of the UBE science programme might be gradually drifting downhill if the implementation is entrusted into the hands of people that are ill-equipped for the task.

Development of Biology Teachers for the UBE Programme

It is no longer strange that NCE is the base line certificate for entry into the teaching profession. In order that none of the biology components of the UBE science education is skipped by science teachers during lesson preparation and presentation, the teachers should be professionally groomed on various topics in the curriculum. At the primary school and J.S.S levels of instruction the learners become easily bored when the volume and duration of instruction is extensive. On the contrary, they remember more of those concepts that impinge on their sensation of sight, touch, smell or feeling. Development of the pre-service biology teacher for professional competences should therefore be structured to expose him to:

1. Relating Concepts with Socio-Cultural Practices

The training of the pre-service biology teachers preparatory for the UBU science programme should include the use of resources available in the learners' immediate locality. Ukpene (2002), had suggested the use of the bilobed and quadrilobed Kolanuts to illustrate the early stages of cleavage or

the end-product of mitosis and meiosis respectively, while lessons on gene loci and gene linkages could be built around local beads of "jigida" worn around the waist by women in some traditional institutions.

2. Studying Difficult Concepts

The biology panel workshop of STAN in 2003 in Kaduna, vigorously attempted to tackle some difficult concepts in biology such as ecology, genetics, evolution, practical concepts, and many more. The pre-service biology teachers should pay serious attention to lectures on these and other topics while in training so that the level of mastery attained might be adequate for teaching the related components in the UBE science curriculum.

3. Practical Work

Poor background in biology practicals is the bane of some biology teachers in schools. The pre-service teachers should be taught to master the art of observations, the skills of making correct drawings and labeling them, taking measurement and generating scientific data, sectioning of plants and animal specimens as well as develop the ability to interpret biological data and draw inferences. Above all, pre-service teachers should be exposed to the art of making valuable improvisations so that the dearth of the real equipment would not constitute impediments on the teaching-learning process.

4. Interrelationship with Other Subjects

Biology is interdependently related with a number of subjects:- mathematics (shapes of objects and specimens, values of measurements, interpretation of data, size of drawings). Chemistry (the chemical basis/components of life); physics (optics – eye, image formation, and reflectors); geography (soils and ecological biomes) and so on. The pre-service teachers should be exposed to these interrelatedness so that they are well knowledgeable in the field.

Professional Gains From Competent Pre-service Biology Teachers

There are a number of institutional advantages to be derived from the acquisition of appropriate professional competences by the pre-service biology teachers.

1. They would be able to exhibit a high degree of mastery of all topics in the primary school and in the J.S.S science curriculum.
2. They would also be able to evolve appropriate teaching and evaluation techniques for each curriculum unit without doing selective teaching on the guise that some units are abstract or difficult.
3. Ensure that opportunities for students to plan and carry out scientific investigation in their own way leading to tangible discoveries and improvisation (as cited in Bdliya, 2002) are provided.
4. They would properly guide the learners in identifying problems, formulating appropriate hypothesis or statement of tentative guess that might lead them towards proposing the most viable methodology or selecting the most relevant equipment and apparatus for demonstration and problem-solving.
5. The learners would also be exposed to handling science apparatus, plan and carry out scientific experiments under approved safety conditions, make observations, take measurements, record results, generate and interpret scientific data as well as draw valuable inferences.

Recommendations

1. Pre-science teachers should not show preference for some topics while in school. As much as possible they should show equal interest in all aspects of learning experiences they are expected to acquire. This will prevent selective teaching (while in the field) on the premise that some concepts are difficult.
2. The pre-service teachers should be exposed to various techniques on improvisation so as to be able to function effectively in this era of insufficient funding of educational institutions and dearth of instructional materials.
3. They should actively be made to participate in the day-to-day practical lessons which form the integral part of their training programme.

4. Pre-service teachers should be exposed to a 2-tier teaching practice exercise so as to perfect basic teaching strategies and correct errors initially identified in the first instance.
5. Trainers of pre-service teachers should always endeavour to source examples of learning materials from the learners' immediate locality so that when the latter go into the field as teachers they might be able to equally associate learning experiences with the socio-cultural practices that is prevalent in their pupils' environment.

Conclusion

With the above gains, pupils in the Universal Basic Education Programme would be exposed to the fundamental tenets of science education. They would also be practically seen to be doing science instead of merely learning science to acquire the requisite for passing prescribed examinations. If we have professionally competent teachers for the UBE science curriculum our children would be shown the way of doing science and they would never depart from it.

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