

ADMISSION OF NON-SCIENCE STUDENTS INTO PRE-NCE SCIENCE PROGRAMMES OF TEACHER TRAINING COLLEGES: IMPLICATIONS FOR SCIENCE AND TECHNOLOGY EDUCATION

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Abstract

This paper examines the rationale behind the introduction of the preliminary Nigeria Certificate in Education (Pre-NCE) programme into the Nigerian teacher training Colleges. It points out the observed apparent move to prepare professional science teachers from non-science stock through the Pre-NCE Science programmes of the Nigerian Colleges and in the light of the NCCE minimum standards and curriculum diversification policy of the national policy on education argues that the Pre-NCE Science programme is meant for candidates with previous science background knowledge in their post primary level of education. It maintains that such candidates who are in the programme without this background knowledge are academic misfits. Implications of this for science and technology education are highlighted.

Introduction

Preliminary Nigeria Certificate in Education (PRE-NCE) programme was borne out of the need to meet the shortfall in the enrolment of students in the Nigerian Colleges of Education through Polytechnics and Colleges of Education Matriculation Examinations. For instance, NCCE (2002) reported of an average enrollment of 1240 students per College of Education in 1994 / 95 session and the worst total entries of 6000 students into all College in 2001 through Polytechnics and Colleges of Education Matriculation Examination. Besides, the programme became imperative because of the need for the Nigerian Society to produce more qualified teachers, both in quality and quantity, to match the ever increasing and teeming population of pupils / students enrolled annually into our nation's expanding primary and secondary schools.

According to Ukwungwu and Nworgu (1999), most Colleges of Education in Nigeria introduced the programme in the hope that it would give them greater involvement in preparing and selecting students for the NCE programme. It is a one year programme aimed at making students deficient in entry requirements to remedy such deficiencies. This aim is well amplified in a foreword by Borisade in NCCE (2002:v), regarding the introduction of the Pre-NCE minimum standards for Colleges of Education when he remarked, thus: "*It is my hope that Pre-NCE minimum standards by NCCE will build on the experiences acquired at the secondary school level while at the same time remedying the inadequacies in the entry qualifications of applicants into NCE programme*".

In the light of the above statement, it is evident that the overall goal of the programme is to produce qualified candidates for admission into the NCE programme in the respective subject areas to which they were exposed while in the secondary schools. The introduction of the minimum standards, seeks to harmonize the programme and to remove any disparity in terms of curriculum contents and entry qualifications formerly adopted by different individual Colleges of Education. The need for a continuity in exposing students to their respective subject areas is again realized from the National Policy on Education (1998), which puts a premium on laying a "sound basis for scientific and reflective thinking" and offering a "diversified curriculum to cater for the differences in talents and opportunities" of individuals. It is therefore, little wonder why the Pre-NCE programme is divided into broad subject areas of languages, business, social science, science and vocational with English language and Mathematics as compulsory subjects. Candidates are therefore, required to choose one area from any of these areas relevant to their previous levels of exposure.

However, by virtue of inability or otherwise to meet the admission quota in the ratio of 70:30 science to arts, many teacher training Colleges tend to resort to admitting non-science (arts) students through the Pre-NCE programme into Pre-NCE science programmes sometimes contrary to the whims and caprices of the applicants. Some of such applicants/entrants manoeuvre through the Pre-NCE science programme and are found in (lie NCE science programmes without the pre-requisite science background knowledge of even biology or general science at (heir secondary school level. It is against this background of the move to prepare professional science teachers from non-science stock that this paper is relevant. This paper examines the topic under the following headings:

- (a) Requirements for entry into Pre-NCE Science programme.
- (b) Academic misfits (square pegs in round holes): Implications for science and technology education.

Requirements for Entry into Pre-NCE Science Programme

The National Commission for Colleges of Education minimum standards for Pre-NCE (2002:72,76,102) states categorically that a candidate shall be eligible for admission into the preliminary NCE science programme if he/she holds any of the following qualifications:

- (i) 2 Credits and 3 passes at NECO/WAEC SSCE or NABTEB examinations in relevant subjects including biology, general science or integrated science, chemistry, physics, mathematics and English Language in not more than two sittings or
- (ii) 1 Credit and 4 passes at NECO/WAEC SSCE or NABTEB examinations in relevant subjects including biology or general science or integrated science, chemistry, physics, mathematics and English Language in not more than two sittings or

- (iii) 5 passes at NECO/WAEC SSCE in relevant subjects including biology /general science or integrated science, chemistry, physics mathematics and English Language at not more than two sittings or
- (iv) 2 credits/merits and 3 passes at Teacher's Grade II Certificate Examinations in relevant subjects including biology/general science or integrated science, physics, English Language and mathematics in not more than two sittings,
- (v) 5 passes at Grade II Teachers' Certificate Examination in relevant subjects including biology, chemistry, physics, integrated science, chemistry, physics, English Language and mathematics in not more than two sittings.

A cross-examination of the entry requirements shows that for a candidate to qualify for the Pre-NCE science programme, he/she must have at least one or two credits and or some passes in the core science subjects of biology, chemistry and physics as well as in mathematics and English Language usually offered in the programme. While general science is counted for holders of teachers' grade II, integrated science is not considered for NECO/WAEC SSC holders otherwise JSSC would have been listed as one of the entry requirements. This implies that, students who never offered biology, chemistry and physics in their senior secondary school level after junior secondary education are not well grounded for the programme and are therefore, misfits for the preliminary Nigeria Certificate in Education. Enrollment of misfits into the programme is a negation of the National Policy on Education on curriculum diversification and tantamount to running contrary to the laid down and harmonized minimum standards for Pre-NCE programme of Nigerian Colleges of Education.

Academic Misfits (Square Pegs in Round Holes): Implications for Science and Technology Education

a) Drowning by the Programme

Science is a systematic study of nature as it takes an orderly investigation and search for the understanding of phenomena. The study of science is much like a newly borne child who cannot begin to run at the time of birth but has to learn first how to sit, crawl, stand up and then walk. After perfection in the skills of walking, he then begins to make initial moves to run at an appreciably "mature" age of course and not as a neonate. The ability to learn science as Ogunniyi (1978), pointed out is not based on undefinable variables but on specific factors differently and jointly influencing the learner among which is the background knowledge of the learner. This background knowledge represents the lower level concepts or skills/prerequisite knowledge or skills which the learner must master in order to understand higher level concepts/skills (Gagne, 1975).

In this way, entrants into a science programme without the prerequisite background knowledge which they ought to have gained at their secondary level of education are analogous to neonates who naturally cannot run at birth. Thus, for the science teachers to make them cope with their new environment, the teachers are thrown into the task of adopting different teaching / learning strategies including the indirect use of examination questions in tutorial classes. Notwithstanding these approaches, teaching them is analogous to teaching someone to swim by throwing him into a deep pool of water on the assumption that he will learn necessary skills he needs to enable him swim. This is difficult and leads to a large number of casualties with many of the students drowned by the programme (Ogunniyi, 1978). It is therefore, no wonder, why such students write NACL (sic) for sodium chloride or list the common laboratory accidents to include "pipette, burette, stirrer, beakers and apparatus" (sic).

(b) Performance and Probation Cases

It can be argued that the academic performances or achievements of misfits into a science programme are generally very poor since naturally they have been drowned by the programme. For those of them who can manoeuvre and move into NCE I, their cumulative GPA is usually appalling and at the end of their year one, they have already been placed on probation. Despite their probation status, the science teachers still have the onus of educating and transforming them into future scientists with the hope of making them able to scientifically and technologically move our nation forward. How possible and feasible is the task with this crop of "new science" students? What strategies should be used? These are indeed big questions for the science lecturers to grapple with.

(c) Withdrawal and Interdepartmental Transfer

The problem of probation most often translates into interdepartmental transfers when the candidates do realize their true level. While some candidates embark on this transfer on time, others realize it even too late and before they could have enough time to adjust and manage to graduate, time has run out. They are therefore, shown the way out of the College and there by withdrawal. Thus, their time, strength and parents' finance for the wasted years become fruitless. The question then arises as to whether the aim of the Pre-NCE science programme has been met or whether the programme has produced the required number of qualitative and quantitative science teachers for our society's needs.

(d) Product Quality and Institution's Image

Apart from the fact that some of these misfit Pre-NCE candidates admitted into the NCE programme end up with withdrawal, some however, manage to graduate with very low grades. As poor quality products, they have nothing to prove their worth to their employers in their places of employments. When this happens, pertinent questions are usually posed regarding their alma mater. Such questions bother on where they graduated from and on who taught them. Many such questions tend to tarnish not only the image of the institutions from where these candidates graduated but also the teachers who taught them. To remove this stigmatizing mark should be both the concern of the institutions and the teachers.

(e) Weak Scientific and Technological Base

Science and technology, the world over, has been endorsed, as an index of socio-economic and political development of any nation and the bedrock upon which scientific and technological development depends is science education. This is so because science education aims at producing scientifically literate society and the development of potential scientific and technological manpower. As Ogunniyi (1978) remarked, the type of science education available in the "so called advanced countries of the world is responsible for their giant scientific and technological strides". It therefore, stands out clear that by releasing into the society poor products to educate the young minds scientifically, a contribution is made to the laying of a weak foundation for our much cherished and desired scientific and technological advancement. As Salesman (2000:172), noted that, "poor quality teacher education breeds ill-prepared teachers who in turn lose confidence of themselves in the face of the challenges of the modern world of science and technology. As a result, mediocrity sets in and mars the education system that would only produce vicious circle of mediocres".

Recommendations

To achieve the goal of producing qualitative science teachers at the Colleges of Education level, the following recommendations are proffered:

1. Entrance examination should be conducted by individual Colleges of Education for admission of candidates into the Preliminary Nigeria Certificate in Education (Pre-NCE) Science programme.
2. A committee of men and women of probity and proven integrity should be set up by individual Colleges of Education to screen candidates admitted into the Pre-NCE/NCE Science programmes to ascertain the adequacy of their O-level requirements for admission.
3. A screening exercise should be carried out annually to ensure that no candidate admitted with any requirement deficiencies is allowed to graduate without showing evidence of clearance from such deficiencies no matter their modes of entry.

Conclusion

It is worthy to remark that teachers are the centres of educational quality and the learners the centres of any educational system. If Nigeria therefore wants to achieve her national objectives of being a united, strong, self-reliant nation, just and egalitarian society, a great and dynamic economy, a land of bright and full opportunities for all citizens and a free and democratic society (NPE, 1998), great attention must be paid to the production of qualitative science teachers who will educate the young minds and transform them into potential future scientific and technological giants for our socio-economic and political advancement. This attention must cut across all levels of our educational system including the training of Pre-NCE science students in Nigerian Colleges of Education.

References

- Federal Republic of Nigeria (1998). National Policy on Education (3rd Edition). Lagos: NERDC Press.*
- Gagne, R. M. (1975). Essentials of Learning for Instruction. Hindale Dryden Press (H.R.W.).*
- NCCE (2002). National Commission for Colleges of Education Minimum Standards for NCE (Pre-NCE). NCCE, p. 72-85, 102-109.*
- Ogunniyi, M. B. (1978). Teaching Science in Africa. Nigeria: Salem Publishers (Nig.) Ltd.*
- Saleeman, S. I. (2000). Towards the Production of Nigeria Certificate in Education (NCE) Teachers in Nigeria in the 21st Century: Focus on the Kwara State College of Education, Ilorin, Zaria Journal of Educational Studies 4(1 & 2) 168 - 176.*
- Ukwungwu, j. O. & Nworgu, B. G. (1999). Affective and Cognitive Correlates of Achievement in Pre-NCE Physics Course, Journal of Science Teachers Association of Nigeria. 34 (1&2), 102-106.*