

COMPETENCES FOR SELF-SUSTAINABILITY AMONG HOLDERS OF VARIOUS BIOLOGY DEGREES FROM NIGERIAN UNIVERSITIES: A CASE STUDY OF KANO STATE

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Abstract

This study was necessitated by the relative number of graduates that roam the streets in search of paid employment. The investigation which focused on graduates from biological disciplines noted that besides the capacity for white collar jobs, the average Nigerian biologist lacks effective training for self-sustainability. The paper suggests that elements of vocations should be introduced into their curriculum so that Nigerian University graduates in biology could be self-employed and adequately remunerated.

Introduction

Beginning from the early 1980s, the zeal with which Nigerian youths sought admission into Nigerian Universities was unrivalled since independence. The glamour of being associated among the cream of University students was strong, much stronger than the viability and self-sustainability of the certificate that would be ultimately obtained at the end of the course programme. In the period under review, job opportunities were readily available for University graduates. This is partially attributable to the copious availability of jobs following the national reconstruction of the post civil war years from the 1970s. The increased yearning for the acquisition of western education was complemented with sharp increases in the number of educational institutions and in students' enrolment figures (Okebukola, 1984), although increase in students enrolment figures in biology as well as other sciences was slow compared with the social sciences and liberal arts (Akpan, 1986). The science graduate turnover over the years following the embargo on civil service employment by the regimes of Ibrahim Babangida and Sani Abacha had culminated in the accumulation of several generations of unemployed biology (including other science) graduates in the country. Their inability to diversify is made worse by their academic training lacking veritable elements of vocational skills.

Meaning and Essence of Science Education

Ukpene (2002a), noted that science education includes the application of the essential drives behind scientific processes (observation, classification, measurement and experimentation) into the diversified facets of human enterprises in the environment for a better living. Science education has gains, among which, include, to:-

- i. Develop the powers of positive thinking
- ii. Generally emancipate the citizens from squalor by raising their standard of living through provision of employment opportunities (Akanbi, 1998).

Abdullahi (1998), espoused that the mission of science education is to conquer the mountain of facts and the exploration of the forest of knowledge in the development of man's intellect and improvement of his environment. He further asserts that intelligence, if properly developed and used, can eliminate all human problems including poverty and disease. Furthermore, Sanders (cited in Abdullahi, 1998) postulated that :

There are countries in which unnecessary poverty prevails because the people as a whole are unaware of the methods whereby it can be relieved. There are vast tracts of land, abandoned or never cultivated, which could support a thriving community if full use were made of the knowledge and skills of scientists. There are innumerable people suffering from disease which can be cured and from which by following simple scientific rules of hygiene, they need never again suffer. There are vast storehouse of natural power, such as the wind, waterfall and the heat of the sun, which science can

the raising of the standard of living. The possibilities are enormous. But the difficulties in the way of effecting a change for the better are not less enormous and are often overlooked. The full benefits of science can only be gained with the co-operation of the people in need of assistance. That co-operation is regrettably ineffective unless the people also have some understanding of the means used. To raise the standard of living in any country, two things are needed: Scientific knowledge and a population sufficiently educated to understand how to apply it. Without the latter the expected benefit will not come. (P.95).

For the graduate of biological sciences the opportunities for eking out a viable means of self-sustainability should be vast. But deriving from a system of education replete with notable infrastructural and instructional deficiencies such as poorly equipped laboratories, obsolete equipment, dearth of reagents and consumables (thanks now to the Education Tax Fund) compartmentalized learning occasioned by avoidable industrial strike actions among University staff, one becomes sceptical whether adequate attainment of institutional and instructional goals are being achieved. This affirms the postulation of Ihiagbulem, (1997), who observed that students' attainment of instructional objectives in science; technology and mathematics depends to a large extent on the teachers' proficiency in doing their work. Added to these are the science syllabi of instructions, which are out of tune with the present day socioeconomic realities by lacking veritable elements for the acquisition of competences for self-sustainability. In the face of these deficiencies, this paper is agitated to find out whether the Nigerian-trained biologist is sufficiently educated to internalize the principles of science and to use them to overcome the scourge of science graduate unemployment or underemployment that presently afflicts the vast population of Nigerian graduates.

Some Common Terms:

Self Sustainability: Hornby (1999), asserts that sustainable refers to the art of keeping something going or maintained. However, as used within this paper, self-sustainability describes a situation whereby graduates draw from their learning experiences to set up vocations for purposes of earning a livelihood without depending on paid employment.

Unemployment: A state of being without a paid job.

Underemployment: Picking up a job demanding a qualification and skill less than one actually possesses.

Purpose Of the Study

The purpose of the study includes amongst others, to:-

- i) Investigate the competences of biology graduates for self-sustainability
- ii) Study the suitability of biology graduates for employment in the civil service
- iii) Analyze the potentials of education biologists towards diversifying their capacities for gainful employment.
- iv) Make suggestions on enhancing the capacities of different types of biology graduates for self-sustainability.

Problem Of the Study

The problem of youth unemployment is global in scope. How best a nation can ameliorate the scourge of graduate unemployment depends, to a large extent, on the quality of education it provides its citizens, and how much the recipients of instructions are able to internalize the relevant components of instructions and apply them to problem solving. While the school age continues to decrease in the country, the global oil glut is having its attendant toll, declining the corporate growth and development of the country. Science graduates are churned out yearly from the nation's Universities, Polytechnics and Colleges of Education in thousands yet job opportunities continue to stagnate. Efforts by the government at the centre to create entrepreneurial skills through the Mass Mobilization for Social and Economic Recovery (MAMSER) and lately the National Poverty Eradication Programme (NAPEP) have not yielded the expected gains. The main thrust of the study was to investigate:

- i. Whether or not the type of skills possessed by biology graduates depend on their type of biology degrees.
- ii. If biology graduates from Nigerian Universities possess relevant entrepreneurial skills for self-sustainability in the face of prevailing graduate unemployment in the country.

Hypotheses

The following hypotheses were postulated for the study:-

H_{0i} Competency of biology graduates for self-sustainability is significantly independent of type of biology degree.

H_{0ii} Potentials for employment of biology graduates in the civil service is significantly independent of type of biology degree.

H_{0iii} Training of the biology graduates for other self-sustaining vocations (entrepreneurial vocations) is significantly independent of kind of biology degree.

Sample

The study was focused on graduates of biology in Kano State who are working in the teaching sectors of the civil service. The sample consisted of 62 biology graduates pooled from public secondary schools (26), private secondary schools (25), and from Colleges of Education/College of Arts, Science and Remedial Studies (11). Those working outside this sector of the civil service could not be reached for the study.

Methodology

Instrumentation

A questionnaire designed on a 4-point Likert scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) was administered to the respondents during the WASCE/GCE November/December 2001 co-ordination and marking exercise. The test was trial – tested on sample of 15 biology teachers within Bichi Local Government Area of Kano State, by administering it twice on the subjects within seven days. Resultant test – retest reliability of 0.75 was recorded for the instrument.

Data Analysis

The data collected were analysed using the chi-square (χ^2) statistic. The respondents were classified into three categories namely:-

- i) Respondents with teaching qualification in biology – B.Ed/B.Sc. Ed.
- ii) Respondents with pure science background but later obtained teaching qualification – B.Sc/PGDE
- iii) Respondents who have mainly science background without teaching qualification - B.Sc.

Result

Table I: Competence of Biology Graduates for Self-Sustainability

	SA	A	D	SD	Column Totals	χ^2_{Cal}	χ^2_{Tab}
B.Ed/B.Sc.Ed	obs	5	3	1	21	3.934	12.592
	Exp.	8.53	9.19	1.97	1.31		
B.Sc/PGDE	obs	4	4	1	10	0.257	
	Exp.	4.06	4.38	0.94	0.63		
B.SC	obs	10	19	02	02	2.693	
	Exp.	13.4	14.44	3.09	2.06		
Row Totals		26	28	6	4	64	6.884
Percentage Frequency		40.63%	43.75%	9.38%	6.25%		

Table I on the competence of biology graduates for self sustainability reveals that all the categories of respondents recorded individual χ^2 values of B.Ed/B.Sc. Ed, (3.934); B.Sc/PGDE (0.257); B.Sc (2.693). A cumulative χ^2 value of 6.884 which is also less than the tabulated value $\chi^2 = 12.592$ suggests that all categories of biology graduates lack the professional competence for self-sustainability. However, it is revealed that the B.Ed/B.Sc.Ed factor contributed more towards tendencies for self-sustainability with the highest individual χ^2 value of 3.934.

Table II: Potential for Employment in the Civil Service

	SA	A	D	SD	Column Totals	χ^2_{Cal}	χ^2_{Tab}
B.Ed/B.Sc.Ed obs	28	14	0	0	42	8.731	12.592
Exp.	21.96	14.45	6.05	1.01			
B.Sc/PGDE obs	6	8	4	0	18	2.607	
Exp.	8.78	6.19	2.59	0.43			
B.SC obs	27	21	14	3	65	4.414	
Exp.	31.72	22.36	9.36	1.56			
Row Totals	61	43	18	3	125	15.752	
Percentage Frequency	48.8%	34.4%	14.4%	2.4%			

From table II, it is noted that the computed value of the test statistic $\chi^2 = 15.752$ exceeds the critical value of $\chi^2_{0.05} = 12.592$. We therefore reject the null hypothesis of independence which states that "type of biology degree does not determine the potentials for employment in the civil service" at the ≤ 0.05 . The importance of this result is that civil service employment is open to qualified candidates irrespective of areas of professional qualification.

Table III: Training for Other Self-Sustaining Vocations:

	SA	A	D	SD	Column Totals	χ^2_{Cal}	χ^2_{Tab}
B.Ed/B.Sc.Ed obs	41	36	13	3	93	5.000	12.592
Exp.	31.45	43.49	13.05	5.02			
B.Sc/PGDE obs	8	19	5	5	37	6.322	
Exp.	12.51	17.30	5.19	1.99			
B.SC obs	45	75	21	7	148	1.171	
Exp.	50.04	69.21	20.76	7.99			
Row Totals	94	130	39	15	278	12.493	
Percentage Frequency	33.81%	46.76%	14.03%	5.4%			

The null hypothesis $3H_0$ which states that "different types of biology graduates in Nigeria are not adequately trained for professional vocations" studied the relevance of training of the biologist for vocations in crop protection, environmental protection, poultry keeping, animal husbandry and commercial laboratory analysis. Table III reveals a computed value of 12.493 which, although sparingly less than the tabulated value of the test statistic $\chi^2 = 12.592$ at 0.05 level of significance, we accept the null hypothesis $3H_0$ and reject $3H_1$.

Summary of Findings

1. The study established that holders of biology degrees from Nigerian Universities lack adequate training for competences for self-sustainability through science-based entrepreneurial vocations. Although most of them take to teaching and some even go to the extent of operating or running study centers for SSCE/JAMB remedial classes, only graduates with B.Ed/B.Sc.Ed may be professionally trained for such.
2. Biology graduates are still trained to a large extent for white collar jobs.
3. The training of biologist in Nigerian universities does not satisfactorily expose learners to skills acquisition education suitable for them to establish vocations such as poultry keeping,

poultry keeping, crop protection, environmental protection, animal husbandry and commercial laboratory analysis.

Discussion and Suggestions

The level of development a nation attains sometimes derives from the level, amount and quality of education the citizens acquire. The intrinsic satisfaction derived from having obtained a university degree is primarily actualized depending on the capacity of the certificate obtained and knowledge acquired to earn the recipient a viable means of livelihood. The present spate of science graduate unemployment is alarming. The continued growth in the population of unemployed science graduates could be ascribed to the fact that the recipients of instructions in science disciplines (except computer science) are mainly trained for white collar jobs, in agreement with Olaitan (1991), cited in Dansarai (1997), that the curriculum did not provide enough activities for students to practically demonstrate, rather emphasis dwelt on 'showing', 'telling', and on observing demonstrations.

The expectations on the science curricula to meet the developmental requirements of scholars in the context of present day challenges is obsolete and at variance with the aspirations for self-sustainability amongst holders of biology degrees from Nigeria Universities.

The decline in readily available government paid employment desires that a reasonable amount of entrepreneurial education components be evolved and introduced for recipients of biology education at all levels of higher education in Nigeria. Such curriculum reform should, among others, address the following:-

1. The training of biologists for the B.Ed; B.Sc.Ed degrees should include course contents such as crop pest invasions, pest resurgence, host plant resistance, biological pest control methods and other components of Integrated Pest Management (IPM). These, in addition to courses on diversity of lower plants where studies are made on pathogenic organisms (viruses, bacteria and fungi), diversity of invertebrates that deal with protozoan and platy- helminthes (intestinal worms) would adequately equip them with background knowledge and predispose them towards establishing small scale consultancy services for protecting crops from pest attacks which usually reduce yield of crops for most resource-poor Nigerian farmers.
2. Also, rabbitary, fisheries, animal breeding, poultry keeping and computer appreciation should constitute the course content of the suggested entrepreneurial education which should be made compulsory for all physical science students.

Apart from the above, the students themselves could enhance their self-sustainability by engaging in the following vocations:-

- 1) Floral Gardening: Here, Ukpene (2002b) noted that students could draw from their knowledge of soil structure, nutrient elements in the soil and their roles in plant metabolism, diversity of higher plants as well as on some knowledge of biotechnology to cultivate flowers of various aesthetic values for sale to individuals and institutions.
- 2) Most Nigerian streets are littered with refuses from poorly disposed bio-degradable and bio-nondegradable polyethylene materials. The unemployed biology graduates could establish and manage small scale refuse collection and disposal outfits for homes, offices and market places. Through this, breeding sites for pathogenic organisms are destroyed and a pollution-free environment as well as a steady source of income is ensured.
- 3) Although some graduates frown at the idea of taking up teaching jobs, it is important for them to note that establishing extra-mural classes is cost-effective and highly lucrative.
- 4) The unemployed biology graduate is encouraged to venture into this vocation as the gains are obviously enormous.

Conclusion

It is possible that graduate unemployment sometimes derives from the preferential cravings of some of the graduates themselves for top-flight executive jobs. However right this assertion might be, no graduate can cope effectively with jobs for which he has not acquired any special skills while in the University. Hence the most veritable legacy the university system can bequeath on its teeming

population of students is to inject adequate and meaningful entrepreneurial programmes for learners to acquire the right competences for self-sustainability.

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