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ORIGINAL ARTICLES

Career Prospects in Physics Education in a Quest Towards Entrepreneurial Skill Development

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ABSTRACT

This study employed a descriptive case study to critically analyse the career prospects in Physics Education. Population involved all physics education students in Lagos state tertiary institutions. Focus Group Discussion was carried out among 40 students selected by simple random sampling technique. Discussions were tape recorded and transcribed. Illustrative quotes representing major themes were identified and reported. Findings revealed that physics education students were unaware of the windows of job opportunities at their disposal. They were completely ignorant of the entrepreneurial options provided by their course of study.

Key words:

Introduction

Physics education is a course of study designed to impart adequate content knowledge of physics and the pedagogical skills on students. The quest for physics education is to improve the teaching and learning of physics. Physics education is offered by some universities and virtually all colleges of education in Nigeria. Two forms of degrees are obtainable in physics education: A Bachelor of Education Degree (B.Ed) and a Bachelor of Science and Education Degree (B.Sc /Ed). The faculty offering the courses mark the divide between the two forms of degrees. In a situation where all science based courses are offered within the faculty of education along with education courses, a B.Ed degree is awarded. However, where two-third of courses offered is domicile in the faculty of science, a B.Sc (Ed) degree is awarded.

It is worrisome to note that students enrolment in physics education has been reported to be very low (Ogunleye, 1999). This low enrolment in physics Education was substantiated in this study (see appendix) Plethora of studies (Okpala & Onocha, 1988; Onwioduokit & Efut, 2000 and Owolabi, 2006) have shown that the teaching of physics in Nigerian schools was dominated by teachers who have no professional qualification. In most cases, these teachers either studied physics as a single honour degree (B.Sc Physics), engineering (B.Sc Engineering) or related science courses (B.Sc chemistry, B.Sc Micro-biology, B.Sc Biochemistry etc). These teachers are incompetent as they only possess the content knowledge but lack the pedagogical knowledge. It is not surprising that physics classrooms are predominantly factual (Owolabi, 2006). This implies that physics students are reduced to passive participants in the classroom. The only intellectual process that would be realized in such circumstances according to Ajeyalemi (2002) would be that which requires students to memorize facts and principles. This situation was largely responsible for students underachievement in physics (WAEC, 2007).

Students low enrolment in science education (physics education inclusive) as noted by Okebukola (1998) was occasioned by low prestige, societal disdain and mockery of teachers. Teaching profession can arguably be said to attract the greatest condemnation in the society. The arrays of career prospects in education most especially physics education is possibly unknown to many people.

Schooling is a preparation for many future endeavours such as wage-employment and self-employment. There is a myopic view among education students that the only opportunity offered by their course of study

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is teaching, a wage-employment. Career prospects in education is far more encompassing Attempt was made in this study to:

i. Establish the status of enrolment of students in physics education.
ii. Critically analyse career prospects in physics education and
iii. Identifies windows of entrepreneurialship options at the disposal of graduates in the field.

Theoretical framework

This study was hinged on the counseling psychology theory of Mcleod (2003).This theory opined that inquiry-oriented approach should be employed to solve problem of educational and career development. According to Mcleod (2003),the first step required is to select people with severe personal difficulties on issues of educational and career concerns. This sample is involved in an interactive sessions on the identified issues. The teacher mediates on dysfunctional areas through enlightenment.

Methodology

This is a descriptive – case study which examined and elicited the career prospects in physics education as a course of study. Population involved all students undergoing a course in physics education in four tertiary institutions in Lagos state. This included 2 universities and 2 colleges of education. Data gathering process took place in two stages. Firstly, content analysis of the school record was carried out to determine students enrolment pattern in physics education. These data were collected in order to validate the claim in existing literature on the status of students' enrolment in physics education.

Secondly, Focus Group Discussion (FGD) was organized among a sample of 40 physics education students (15 university undergraduates and 25 college of education students). The students were selected by simple random sampling (balloting) technique. As a first step, participants at the FGD were required to highlight the career prospects of whoever undertakes a course in physics education. The discussion was guided by the researchers by inviting responses from the participants under the following sub-headings: public service, private sector, entrepreneur, self employment, further studies and vocational training. Participants were allowed to give their contributions within three hours. The second step involved the researchers discussing the windows of opportunities open to prospective physics teachers and lasted for one hour . Discussions were recorded in a tape and transcribed. Illustrative quotes representing major themes were identified reported.

Results

Excerpts from the focus group discussion revealed the following:

Public Service

Generally, all students were able to make meaningful contribution on career prospects of physics education graduates in public service, consensus of opinion gathered revealed the following:

- *Physics education graduates can gain employment into the public service as a teacher in secondary school. They are engaged to teach physics and mathematics.*
- *Physics education graduates can be employed into the civil service and deployed to any of the ministries and paralstatals other than education.*

Private sector

Contributions by participants on career prospects in private sector showed their lack of knowledge of opportunities available to them in the private sector. They responded as follows:

- *Physics education graduates can be employed in the bank and private companies like Construction Company.*

Self employment

Participants were unable to make any contributions with regards to their career prospects as self employed individuals.

Further studies

Majority of the participants were able to respond on the prospects of pursuing higher degrees. Their shades of opinion can be represented thus:

- *Graduates of physics education may aspire to posses higher degrees (M.Ed and PhD) in physics education.*

Vocational training

None of the participants was able to make any contributions. They were completely ignorant of opportunities in this area.

Discussions proceeded further with the researchers making further contributions on the grey areas of career prospects as follows:

Public service

A good first degree result (first class or second class upper) will provide the platform to work as a lecturer in the colleges of education or as a graduate assistant in the university.

Private sector

Private sector is not only concerned about the area of specialization of applicants but also their quality. In most private companies (oil industry, banking, telecommunication and manufacturing industries), refresher training is usually organized for fresh intakes to acquaint them with the world of work. Opportunities are provided for graduate of all disciplines who possess good qualification (first class or second class upper) to apply and sit for aptitude test. Selections are usually done on merit after battery of aptitude tests. Physics education graduates can fit in as customers service officer, production officer, senior technical staff, banking officer and marketing officer and programming officer to mention just a few.

Further studies

Training opportunities abound for graduates of physics education. A physics education graduate can venture into the field of engineering. Such graduates are qualified for postgraduate diploma (pgd) in petroleum, electrical, computer science or computer engineering. Other training opportunities include: Masters of Business Administration (MBA), and Masters of Public Administration (MPA). The interconnectedness between physics and mathematics has lured physics education graduates to professional examinations such as Chartered Institute of Bankers (CIB) and Association of Certified Chartered Accountants (ACCA).

Entrepreneurship

A degree in physics education can make one self-employed. A financially buoyant individual can establish a school since he or she already has a background in education. One may also venture into the establishment of allied schools. These include: special class in physics and mathematics (clinic), consultancy outfit (home services) as home tutors to teach physics and mathematics. If well organized one can employ teachers and organize them into the various homes, thereby be coming an employer of labour.

There are some aspects of physics education curriculum that are vocation- related. For instance, electronics and circuit network are concepts that have direct bearing with electrical, electronics and computer jobs. A physics education graduate can go for further training through apprenticeship to learn the acts of repairing radio, television, handsets, generators, computers and other electronics and mechanical devices. Physics education has provided the prerequisite knowledge of the mechanics of these devices. Electronics courses offered are enough to provide the theoretical backgrounds for these gadgets. Electrical and circuit network also provide all theoretical knowledge of computer and electrical works. What is required is acquisition of practical skills. It has now become a common practice to find physics education graduates veering into computer engineering and internet networking as self-employed individuals cum employers of labour. The balance education provided by the university will help in proper organization and coordination of business. This stands as the most plausible of all the options discussed.

The clarion call all over the world is self dependence and development of entrepreneurial personality. In order to operate effectively as an entrepreneur one requires the following qualities and skills: good inter-personal relations, administrative skills, managerial capability (time management) self motivation, keeping to appointment and honesty.

Discussion of findings

Findings of this study (see appendix) showed low enrolment of students in physics education. This has further validated earlier finding (Ogunleye, 1999) on students' enrolment in physics education. This is expected bearing in mind that students usually prefer to opt for courses that will earn them huge wage. An expectation that may not be realized with teaching .consequently, teaching remains less attractive to students. The Focus Group Discussion (FGD) revealed that physics education students are ignorant of job prospects in the field. It implies that the guidance and counseling units of the institutions are not effective in their discharge of responsibilities. Students are supposed to be properly informed of the career prospects in their course of study during orientation programme. This study revealed further students complete lack of knowledge on the possibilities of self employment.This emanated from the fact that the school curriculum at present is discipline-based and has not promoted entrepreneurial skills.Course content mostly concentrate on the rigour of academic ignoring completely the world of work.It becomes impossible for students to realize the several entrepreneurial options at their disposal.

The present school curriculum in physics has not promoted entrepreneurial skills development both in content and teaching.In the words of Watson(1983) ,the process of curriculum development in science should recognize that,not only must children understand the ideas and concepts of science(know how) and the ways of thinking and doing which characterize science(know how),they must appreciate their application to solving problems in their lives.

Conclusion and recommendations

The essence of education is to equip the head with desirable knowledge, stimulate the heart, liberate the mind and strengthen the hands in order to live effectively in the society. Physics education as a course of study is embedded into all these attributes. It behoves all physics graduates to realise and harness the avalanche of opportunities at their disposals. Students should harness the linkage between physics education and the world of work by utilizing their scientific knowledge in solving their environmental, social, economic and political problems. They should align with the growing drifting away from certificate recognition to good certification and competence. It is desirable to reinforce entrepreneurial skills through:

- Promotion and sponsorship of science fair exhibitions and projects
- Involvement of celebrities in school career talk
- Involvement of physics education students in industrial experience
- Provision of work grants upon evidence of internship
- Integrating practical with theory on concepts that are entrepreneurial oriented in the curriculum.
- Re-invigorating the counseling unit of tertiary institutions.

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Appendix

Students' enrolment in Physics Education in Lagos State Tertiary Institutions in 2008/2009 Session.

Level	Lagos State University			University of Lagos			Adeniran Ogunsanya college of education			Federal college of Education, Technical Akoka		
	M	F	Total	M	F	total	M	F	Total	M	F	Total
100	3	0	3	18	7	25	29	10	39	10	3	13
200	3	3	6	19	3	22	62	20	82	7	4	11
300	1	0	1	16	10	26	34	11	45	8	6	14
400	8	4	12	13	5	18	Nil	Nil	Nil	Nil	Nil	Nil
Total	15	7	22	66	25	91	125	41	166	25	13	38

Appendix above reveals the low enrolment in physics education in all tertiary institutions in Lagos state. Adeniran Ogunsanya College of Education however recorded the highest enrolment because of the several options (PHY/ISC;PHY/CSC and PHY/MATH) available to the students.