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Regularity of Exposure of Physics Teachers to In-service Training Programmes: Implications for Senior Secondary Physics Education and Self-reliance in Akwa Ibom State of Nigeria

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Abstract

The study investigated the regularity of exposure of senior secondary Physics teachers to inservice training programmes in Akwa Ibom State. A sample size of 120 physics teachers, from a random sample of 90 secondary schools, was used for the study. The Regularity of Exposure of Physics Teachers to Inservice Training Questionnaire (REPTITQ) was used in gathering data. The data obtained was analysed using the descriptive statistics of mean (x) and standard deviation (δ). Research findings showed that: a paltry percentage of Physics teachers in Akwa Ibom State are seldom exposed to inservice training programmes. The remaining huge majority of Physics teachers never had inservice training opportunities. This tantamounts to ineffective implementation of the senior secondary Physics curriculum, against the backdrop of exponentially expanding knowledge of Physics and pedagogy in recent decades. The lofty goal of Physics education for self-reliance was therefore, adjudged illusory. A mandatory, regular exposure of all Physics teachers to inservice training opportunities across the professional lifetime of the teacher was recommended.

Educational endeavour is the process of developing knowledge ability in learners in such a way as to use this knowledge to improve themselves and the society. This endeavour is acclaimed to be a practical way of attaining individual and social fulfilment. This is in keeping with the national education goal of "acquisition of appropriate skills and development of mental, physical and social abilities and

competences as requirement for the individual to live in and contribute to the development of the society" (FRN, 2004) which is endorsed as the necessary foundation for building a great and self-reliant nation. Changes in recent decades, worldwide, within the context of global best practices in education show that the extent of realisation of this lofty national goal rests on the quantity, quality and currency of available educational resources.

Concept of Educational Resources

Educational resources consist of all the things in the school (and its' environment) that may facilitate the teaching-learning process. These resources can be delineated into human and non-human resources, the latter being physical, material and financial. Human resources in education are the people who are endowed with a range of abilities, talents, attitudes and roles to influence quality and productivity in education. It comprises all the personnels, staff or workers of different roles in the organisation, as well as those who are likely to be productively employed sooner or later. Physical resources include classrooms, administrative blocks, libraries, laboratories, staff quarters, dormitories and toilets. Material resources in physics education encompass vernier callipers, micrometer screw gauge and stop watches/clocks. Others include ammeters, voltmeters, galvonometers, metre bridges, computers and liquid crystal display (LCO) projectors. Financial resources are the monetary input available for, and expended on, the education sector of the economy.

Physical, material and financial resources are passive productive factors while human resources are the active agents that constitute the ultimate basis for a nation's wealth and they are those who allocate financial resources, exploit physical and material resources; build social, economic and political systems; and carryout national development. Human resource development has, therefore, become the prime concern of every productive organisation.

Human Resource Development

Human resource development may be viewed as a set of systematic and planned activities designed by an organisation to provide it's members with the necessary skills and competencies to meet current, or changing work demands. It is the act of increasing the knowledge-base and skills as well as changing the attitudes of the available manpower to the optimum level. It refers to the creation of appropriate manpower in accordance with the changing occupational needs of the modern society. In anticipation of these changing needs, the Federal Republic of Nigeria (FRN) (2004) stated that: *teachers shall be regularly exposed to innovations in their professions. Inservice training shall be developed as an integral part of continuing teacher education and shall also take care of all inadequacies.*

Clearly, a *country which is unable to develop the skills and knowledge of it's people and to utilise them effectively in national economy will be unable to develop anything else (Monday, 2009).*

Rationale for Human Resource Development in (Physics Education)

Human resource development is informed by the realisation of the need to avert educational systematic collapse due to observed lack of basic skills, emergence of new technology, demand for higher performance standard or observed poor level of academic performance, as well as need to train the trainers on modern pedagogical skills needed to cope effectively with the emerging trends in instructional delivery. It is expected that by the end of exposure to capacity building through workshops, conferences, etcetera,

> modern approaches, skills, strategies and techniques needed by teachers to effectively engineer adequateand appropriate motivation by learners to learn and apply knowledge would have been gained….Allparticipants would have been appropriately motivated and equipped to perform better on theirjobs, providing better on their jobs, providing better services, extending the knowledge acquired in this training programme to other teachers in their enviro-nment who are not opportuned to be at the workshop(Jaji, 2006).

Human resource development has been identified by (Okafor, (2006) as the major propellant of national development while science and technology have been acclaimed the bedrock of accelerated national development, physics education being the hub of science and technology education. Human resource development, therefore, is concerned with the development of human capabilities as well as the use of the capabilities more productively (Abelega, 2003), having become the central feature of most national development strategies and within this, the emphasis has more often than not been on acquisition of scientific and technological skills and capabilities (Lewin, 1992), physics education being the centre of science and technology activities. This implies that human resource development is an investment in people so as to make them grow and contribute to the development of the nation. Human resource development in physics education, therefore, is concerned with the process of making physicists, physics teachers, physics educators and other support personnels to increase their scientific (physics) knowledge or awareness to enable them facilitate or encourage the acquisition of skills, competence and knowledge (Malachy and Chinyere, 2006).

Accordingly, every physics teacher is expected to be professionally up-to-date in training and retraining programmes, through regular attendance at conferences, workshops, seminars, etcetera. Now, against the fascinating backdrop of this expectation, what is the Akwa Ibom State experience?

The Problem

Radically new educational technologies and access to information are permeating the developing world, of which Nigeria is one. Only highly educated, properly motivated teachers who continually learn new professional skills may rise up to the challenges imposed by the new educational environment. Unfortunately, in Nigeria, it appears that most physics teachers are denied opportunity to inservice training. The attendant effect is that most of the physics teachers appear to be deficient in knowledge of current innovative practices in teaching.

In this era of knowledge explosion, a huge majority of physics teachers are rapidly becoming irrelevant, absolate and stale, against the backdrop of their inability to accomplish the objectives of the new senior secondary physics curriculum, and the concomitant students' poor performance in the West African Senior School Certificate Examination (WASSCE) in physics, as observed over the years. The depressing student's poor performance has been blamed on home and school environmental factors. Nonetheless, by far, failure to expose physics teachers regularly to inservice training programmes and the accompanying inability to utilise appropriate human resources for classroom instructional delivery appear to be the most culpable. It has become imperative to empirically investigate the regularity of exposure of physics teachers to inservice training programmes. This is considered a brilliant step to avert a systematic collapse of physics education in Akwa Ibom State, as the research finding is capable of compelling committed efforts towards professional development of teachers to meet with the dynamism of the education sub-sector of the economy.

The research study focuses on senior secondary physics education, since it is at this level that most initiatives are taken and human resource need for development are being identified (Lewin, 1992) as most crucial.

Research Questions

To guide the research study, one research question was formulated, viz: How regular are physics teachers in Akwa Ibom State exposed to inservice training programme?

Methodology

The study adopted a survey research design. The population of the study consisted of all the estimated 276 physics teachers in all the public secondary schools in Akwa Ibom State. A sample size of 120 physics teachers, from a random sample of 90 secondary schools, was used for the study (40 teachers and 30 schools, from each of the 3 senatorial districts of Akwa Ibom State, respectively).

A research instrument, known as Regularity of Exposure of Physics Teachers to Inservice Training Questionnaire (REPTITQ) was used for gathering data for the

study. Developed by the researcher and face-validated by two physics education university lecturers, the REPTITQ was an 11-item questionnaire, with a 4-point Likert-type scale of:

Regular (R)	assigned 4 points
Often (O)	assigned 3 points
Seldom (S)	assigned 2 points
Never (N)	assigned 1 point

The data collected was analysed using the descriptive statistics of mean ($\overline{X}$) and Standard deviation (δ). The following cut-off points for mean scores were used in interpreting data.

1.0	-	1.4	=	N
1.5	-	2.4	=	S
2.5	-	3.4	=	O
3.4	-	4.0	=	R

Results

Table 1: Regularity of Exposure of Physics Teachers to In-service Training Programmes According to Specific Areas of Need

S/N	Specific Inservice Training Area	Regularity of Exposure		
		$\overline{X}$	δ	Remark
1.	Workshop on teaching difficult concepts in senior physics curriculum	2.1	0.89	S
2.	Workshop on ICT capacity-building	1.8	0.55	S
3.	Workshop on organisation and management of physics laboratory.	1.3	0.40	N
4.	STAN physics panel workshop on hand-on and minds-on activities in physics	1.7	0.81	S
5.	Workshop on improvisation of instructional materials.	1.4	0.76	N
6.	Train-the-trainer workshop for secondary school teachers on specialised modern methodological skills	1.6	0.96	S
7.	Sensitisation and advocacy workshop on the new senior secondary school education curriculum for teachers.	1.1	0.80	N
8.	Refresher course on motivational teaching and learning	1.5	0.70	S
9.	Refresher course on continuous assessment implementation.	2.2	0.68	S

10.	Seminar on strategies for managing large and crowded classes.	1.2	0.59	N
11	Yearly conference of STAN on activities that build on scientific understanding	1.3	0.60	N
	Overall	1.56	0.70	S

In Table 1, the mean score for the regularity of exposure of physics teachers to inservice training programmes, according to specific areas of need range from 1.2 to 2.1. This shows that some physics teachers, in Akwa Ibom State, are seldom exposed to inservice training programmes in some areas of need; other teachers are never exposed to inservice training programmes, in any area of need. The small standard deviation values (range 0.40 to 0.89) signify cohesiveness (closeness and agreement) in the ratings of the individual teachers, across the specific training areas.

Discussion of Findings

The study reveals an overall mean value 1.56 for regularity of exposure to inservice training programmes. This implies that a paltry percentage of physics teachers in Akwa Ibom State, are seldom exposed to inservice training programmes; while the remaining huge majority of teachers never had inservice training opportunities. This finding is consistent with Eze's (2006) research finding of inadequate exposure of Science, Technology and Mathematics (STM) teachers, as well as laboratory assistants to inservice training opportunities to enable them improve on their on-the-job performance with particular reference to Enugu state of Nigeria. It is also in line with Ochu''s (2006) empirical result which showed that the majority of teachers in Markurdi Local Government Area of Benue State of Nigeria never attended any inservices training nor belong to any professional association. Similar research result was reached by Okafor (2006) who reported that, "in Nigeria, the important and critical human resource has not been fully developed and enriched in such a manner that will engender national development".

The study reveals that a huge majority of physics teachers

(i) have been and are still being denied inservice training opportunities on crucial areas such as: improvisation of instructional materials, organisation and management of physics laboratory, as well as strategies for implementation of the new secondary education curriculum.

(ii) do not belong to professional associations.

Given such a scenario,

(i) the quality of teaching will expectedly be poor as the teachers instruction will tend to be obsolete; and the students academic performance will tend to be worse off as their knowledge-base will tend to be stale.

(ii) the physics teachers are most unlikely to be able to produce students who will subsequently become good physicists, scientists and technologists in this era of knowledge explosion. The so-called self-reliance targeted by the Federal Republic of Nigeria, would after all be illusive.

Summary and Conclusion

In Akwa Ibom State of Nigeria, a huge majority of the physics teachers are seldom exposed to inservice training programme on specific areas of need such as: teaching difficult concepts in senior secondary physics curriculum, ICT-capacity building, continuous assessment implementation strategy and specialised modern methodological skills; They are never exposed to inservice capacity-building programmes on: improvisation of instructional materials, organisation and management of physics laboratory, as well as strategies for implementation of the new senior secondary education curriculum, with all the trappings of global best practices in senior secondary education. Hence (1) A huge majority of physics teachers in Akwa Ibom State are bereft of the necessary skills and competences expected of them in this era of exponentially expanding knowledge of physics and pedagogy (2) For now, curriculum implementation of senior secondary physics education in Akwa Ibom State, cannot be adjudged to be effective and the concept of self-reliance, through physics education, is illusory.

Recommendations

Based on the findings of the study, the following recommendations are made.

1. Inservice, capacity-building for (physics) teachers should be made compulsory to every teacher and should span, completely, the mandatory 35 years of teaching career, regularly. “The objectives of manpower development in any work organisation is achieved by ensuring, as far as possible, that everyone in the organisation has the knowledge and skills and reaches the level of competence required to carry out their works effectively” (Ahanor, 1990). “The performance of individual employees and teams in work organisation is subject to continuous improvement on their skills” (Osterman, 1995).

2. Financial assistance should be given to (physics) teachers attending conferences and workshops organised by professional bodies such as Science Teachers Association of Nigeria (STAN).

3. Physics teachers should join professional science and technology associations and should constantly read science and technology journals, magazines and bulletins. They should be intrinsically motivated to improve and increase their knowledge-base by going for further studies. They should not be oblivious of the fact that the business of upgrading teaching skills, competences and knowledge of teachers is largely a personal, evolving issue, across the professional lifetime of the teacher.

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