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PAPER 6

STATUS OF SCIENCE AND TECHNOLOGY CURRICULA TOWARDS NATIONAL EDUCATION REFORMS

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Abstract

The study investigated the status of science and technology curricula towards national educational reforms. It was a survey research design with three research questions guiding the study. An instrument known as status of curriculum re-structuring and implementation (SCRI) questionnaire was developed by the researchers and face validated by two science educators from university of Uyo, Akwa-Ibom state. Using simple random sampling technique, 63 secondary school science and technology teachers selected from Uyo local government area formed the sample. Data collected were analyzed using percentages and mean. The results showed the following: that science and technology curricula had been re-structured towards national educational reforms; that apart from integrated science and introductory technology that are implemented in a little way, all the others are yet to be implemented and that, virtually no provisions have been made so far by governments for the effective implementation of the curricula. It was, therefore, recommended that teachers should drop the old curricula at once and adopt new ones which are relevant to the needs of the country. Federal and State Governments should be urged to make funds and other provisions available to ensure that the reform agenda do not fail at implementation level.

Introduction

The issue of reform in the Nigerian educational system is a cankerworm that has eaten deep into the fabrics of educational system. Nigeria has witnessed several educational reforms which started at pre-independence and continued after independence (Bello, 2008). Bello (2008) therefore, concluded that Nigerian educational system is enshrouded in inconsistency and confusion. The failure of reforms generally in Nigeria may be responsible for our very slow progress in every dimension particularly in the education system which determines the overall progress in such specialized fields of science and technology.

Reform refers to improvement by alteration; a correction of error or removal of defects (Yahoo! Education in Yusuf and Yusuf, 2009). Young and Levin in (Yusuf and Yusuf, 2009) defined educational reform as a

programme of educational change that are government directed and initiated based on an overtly political analysis and justified on the basis of the need for a very substantial break from current practices. Yusuf₁ and Yusuf₂ (2009), therefore, concluded that reform in Nigerian education is a Federal Government induced and directed substantial alteration of the Nigerian educational system (programme, curriculum, agencies, education levels etc.). In a nutshell, educational reforms, therefore, can be referred to as a process of re-designing, re-structuring or transformation in the educational system with innovative measures for improvement upon the existing one.

The urge to chart a new course in Nigerian educational system through reform has been the desire of many stakeholders in education and got rekindled ever since Nigeria got her independence. The first attempt at reforming Nigerian educational system was at a curriculum conference in Lagos in 1969 which attracted a lot of stakeholders in education. Attempts have been made several times in terms of reform agenda to break the shackles of technological poverty in the country but such efforts had always met with failure at implementation. All attempts to empower the country towards the path of scientific and technological development through reforms in the Nigerian education system were met with inconsistencies and confusion; otherwise, what could be responsible for a country like Malaysia which came to Nigeria to borrow oil palm tree seedling in 1960 being far more advanced in production of all products associated with palm tree today?

From a global perspective, Nigeria joined other countries in being a signatory to the two prominent goal clusters – the Millennium Development Goals (MDGs) and the Education For All (EFA) goals. In order to concretize action, based on Federal Government's realization of the need for reforms in science and technology as a vehicle for national development, the National Economic Empowerment and Development Strategy (NEEDS) was introduced as a reform measure in 2004. Today, the Nigerian educational programmes are anchored on international development goals with the slogan, MDG-and-NEEDS driven reform initiatives as the catch phrase (Ngwu, 2008). As the NEEDS document (NPC, 2004: 35) noted, "... the goals of wealth creation, employment generation, poverty reduction and value re-orientation can be effectively pursued, attained and sustained only through an efficient relevant and functional educational system."

Educational system plays an indispensable role in shaping the economic realities of a society and therefore needs to be reformed when the need arises. According to Bello (2008), the process of education reforms must match modern scientific and technological innovations for it to remain relevant to the learner and the nation. Consequently, science and technology which are the two recognized potent sources for social and economic changes in the contemporary history of mankind should be given appropriate place in the process of educational reform. The implication is that school/educational curricula, especially the science and technology curricula have to be enriched by way of re-structuring and implementation since according to Ajewole, Nzewi and Aganga (2009), curriculum is a pivot on which economic, political, social and educational development challenges of a nation hinge.

It, therefore, becomes expedient to respond to the Federal Government's reform in education for the attainment of the MDGs and the critical targets of NEEDS through re-structuring of existing school curricula and implementation. Through well-structured and implemented curricula at all levels of education, the critical elements of NEEDS which include value-re-orientation, poverty eradication and job creation and employment will be highly achieved.

The general objective of this study, therefore, was to determine the status of secondary school science and technology curricula in terms of re-structuring and implementation towards the national education reform. Specifically, the study intended to determine:

1. the areas of science and technology that has been re-structured towards the national educational goals;
2. the extent of implementation of the re-structured curricula; and
3. the extent of provisions made toward effective implementation of the curricula.

Research Questions

The following research questions guided the study:-

1. What areas of science and technology curricula have been restructured towards national educational goals?
2. To what extent have the re-structured curricula been implemented in the different areas of science and technology?
3. To what extent have provisions been made towards effective implementation of the curricula?

Method

The study adopted a survey research design. The population of the study consisted of all the science and technology teachers in all the public secondary schools in Uyo local government of Akwa Ibom state. Using simple random sampling technique, a total of 63 science and technology teachers in Uyo local government were selected as the sample size. This was made up of seventeen (17) integrated science, eleven (11) chemistry, fifteen (15) biology, twelve (12) physics and eight (8) introductory technology teachers.

An instrument known as Status of Curriculum Re-structuring and Implementation (SCRI) questionnaire developed by the researchers and face validated by two science education teachers from University of Uyo, Uyo Akwa Ibom State was used in collecting data for the study. Section A of the questionnaire was on the teachers' personal data while section B was on the areas of the science and technology curricula re-structured, the extent of implementation of the re-structured ones if any and provision of materials for implementation. The Instrument is a four point-Likert type scale of very great extent (VGE) - 4 points, great extent (GE) - 3 point, little extent (LE) - 2 point and not at all (NAT) - 1 point. Data collected were analyzed using percentages and the descriptive statistics of mean. The following cut off points was used on the data collected: mean scores of 3.50- 4.00, very great extent; 2.50 - 2.49, great extent; 1.50 - 2.49, little extent; 0.50 - 1.49, not at all.

Results

Research question 1:

What areas of science and technology curricula have been restructured towards national educational goals?

Data collected with the items on areas of science and technology curricula that have been restructured towards national educational goals was analyzed using frequencies and percentages. Summary of result is presented in Table 1.

Table 1: *Areas of science and technology curricula that have been re-structured*

Areas of Science and Technology	Re – Structured	Not Restructured
Integrated Science	17 (100%)	0 (0%)
Chemistry	8 (72%)	3 (28%)
Physics	5 (42%)	7(58%)
Biology	8 (60%)	7 (50%)
Introductory Technology	3 (37%)	5 (63%)

From Table 1 (above), it is shown that all the areas of science and technology have been re-structured towards this national educational reform though a good number of the teachers are not even aware of the fact that the curricula have been re-structured.

Research question 2

To what extent have the re-structured curricula been implemented in the different areas of science and technology?

Data obtained with the items on extent of implementation of the restructured curricula in the areas of science and technology were analyzed using mean scores on 4-point basis. Summary of result is presented in Table 2.

Table 2: *Mean rating of the extent of implementation of the re-structured curriculum in the different areas of science and technology.*

	Different Areas of Science and Technology	Mean	Remark
1	Integrated Science	1.83	Little extent
2	Chemistry	0.79	Not at all
3	Physics	0.95	Not at all
4	Biology	1.24	Not at all
5	Introductory Technology	1.15	Little extent

From Table 2 above, it is shown that apart from integrated science and introductory technology which are implemented in just a little extent, all the other sciences are yet to be implemented.

Research question 3

To what extent have provisions been made towards effective implementation of the curricula?

Data collected on the extent to which provisions have been made towards effective implementation of the curricula were also analyzed using mean scores. Result is summarized in Table 3.

Table 3: Mean ratings of the extent of provisions made for effective implementation of the curricula.

SN	Provisions to be made	Science		Technology	
		Mean	Remark	Mean	Remark
1	Creation of awareness among teachers on the (MDGs) and critical elements of (NEEDS).	0.57	Not at all	0.83	Not at all
2	Provision / equipment of laboratories for hands-on activities	0.00	Not at all	0.25	Not at all
3	Provision of reading / instructional materials and infrastructure	1.23	Not at all	0.79	Not at all
4	Provision and usage of ICT materials for implementation	0.94	Not at all	0.63	Not at all
5	Organization of seminars / workshops for improving teachers pedagogical skills e.t.c	0.00	Not at all	1.17	Not at all

Results from Table 3 above showed that no provision has been made at all in both science and technology for effective implementation of the curricula with respect to the points enumerated above.

Discussion

The results of this study have revealed some facts about the status of science and technology curricula in secondary schools towards the national education reforms. The re-structuring of the curricula is just one of the measures to be taken towards national education reforms. This is an indication that science and technology education is already on the appropriate channel towards national education reforms. The questions now become how adequate is the re-structured curricula in terms of the needs/goals of the nation and how much of the critical elements of NEEDS are infused into the curricula? With reference to basic science, Duada & Udofia (2010), who compared the old integrated science curriculum with that of the basic science, observed that the new curriculum is seriously influenced by the proposals of the Nations toward MDGs and emphasized entrepreneurship education. This is what is expected of every other curriculum and should be looked out for in others and whereby these are lacking, then the curriculum has to be reviewed.

However, it should be noted that a well structured curriculum without proper implementation has no meaning. The finding of little or no implementation of the curriculum is in agreement with Ajibola, (2008) and Bello, (2008) who on analysis of the Nigeria educational system found out inconsistencies and confusion in policy formulation and implementation. Although the little or no implementation of the new curricula can be excused for now on the basis of it's newness and lack of creation of awareness, nevertheless, if serious efforts are not made towards proper implementation, the good intentions of the reform will like other reform agenda fail at the implementation level. The researchers are of the opinion that Dauda & Udofia's suggestion on how to make the implementation of basic science a reality should apply to every other curriculum in addition to other measures as would be suggested by others. They suggested that UBE curriculum implementers should look at the prevailing circumstances at the schools and attempt to predict the achievement goals and formulate curricula objectives. This can serve as a starting guide especially now that virtually all the science and technology teachers are yet to implement these curricula. On the other hand, government's insensitivity in the provision of materials for the effective implementation of these curricula is another acute factor that needs to be addressed. The implication is that achievement of the MDGs and the critical targets of NEEDS may not be a reality as teachers efforts alone may not help much. Since the

curriculum especially that of science and technology is the pivot on which most of the developmental challenges of a nation hinge, adequate provisions of materials has to be made for effective implementation. Teachers need to be encouraged in form of training through workshops and seminars and provision of necessary materials for effective implementation as well has to be taken serious if we really want to reform education.

Conclusion and Recommendation

From the findings of this study, it can be deduced that apart from re-structuring of the science and technology curricula little or nothing has been done on the curricula with respect to national education reform. Reforming education is not an easy task; it has to take care of a lot of factors starting from the national needs through the country's national policy down to school curriculum and its implementation. It is, therefore, recommended that teachers should be encouraged to change to the new curricula and commence implementation at once. Teachers on the other hand need to be provided for in various ramifications to enable them carry out the implementation effectively. Both state and federal governments are expected to provide necessary items needed for implementation of the reform

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