RE-ENGINEERING SCIENCE EDUCATION FOR EMPLOYMENT AND SELF- PRODUCTIVITY IN NIGERIA

Ibraheem A.O. Obori
Kogi State College of Education (Technical),
Kabba.

Abstract

This paper presents a report on a study which sought to examine the extent the Federal government has made efforts in re-engineering science education towards functional literacy programme and improvement in the socio economic lives of the beneficiaries i.e. for employment and self productivity. In quite some years the government in various ways attempted to re-engineer science for the citizens to become self reliance and improve individual to be highly productive. Some popular nations like Japan, Serbia, Ghana etc had great achievement through Reform agenda programme. Such programme like this was embarked by Federal government in 1982, by supplying science equipments to all the secondary schools in the country but most of the schools failed to complement the government efforts to install the equipments for use. As a result we also investigated into the impact that graduates from the few schools with installation of science equipments i.e. Group 'A' schools and those graduates from Group 'B' schools without installation of science equipments, have on their immediate community. A total of 45 secondary schools in Kogi central zone that were supplied but only 8 schools out of 45 installed their science equipments. So from the analysis of data, it was discovered that graduates from group 'A' schools, will have positive effect on the community for self reliance, high productivity that could consequently develop the country to a great nation. It was recommended that the Federal government should supply such science equipments periodically and set up supervisory body on installation of such equipments for greater achievement

The last few years have witnessed a realization that, the type of education offer and in Nigerian school finds it difficult to meet the needs of our society. Numerous researchers in the past failed to see the need to shift from focusing mainly on measuring student outcomes to critically looking at other areas which although seldom assessed, contribute significantly to and compliment achievement of the outcomes of learning science. Really, this will not provide us with adequate understanding of the type and that the study of science and technology might provide a more promising approach to better understanding the most desired needs to our society (Hash-weh, 1996).

The recognition of the importance of science in nation development by Nigerians has begun to manifest itself in many concrete ways (Aghenta, 1981). The

long period we have been with the inherited colonial system of liberal arts had really carried our attention thousand kilometers away from the society needs. Popovic (2010), consider that one of the main reason for the scant attention paid to literacy promotion is that education is not held high in the value system; therefore people are not motivated to obtain literacy skills as the first step of long educational journey. Hence, the existing system of education can be considered inadequate and dysfunctional by them.

Then the idea of Re-engineering Science Education gradually began when the school certificate results of ten secondary schools in Edo State for the year's 1979 and1980 were analysed and examined critically; it was echoed out by the then vice-chancellor of the University of Benin, professor Baikie (Ibrahim, 2009) triggered the federal government attention to this critical area of education. That particular period, the policy makers were oversighting or ignoring the importance of secondary schools in the development of high level (skilled) manpower. This neglect was then resulting the shortage of science teachers and other high level manpower in science and technology.

In 1980, the federal government openly re-engineered science education by Involving in students enrolment into universities by its directives in the ratio of 60 science to 40 non- science disciplines. Furthermore, the new presidential universities are in name and content universities of Technology, many polytechnics and colleges of technology have been established in the country to accommodate more students to read science. Some state governments put up efforts of motivation giving incentives to science teachers in secondary schools in the form of monthly cash payment. Incentive was given to science teachers as the implementers of this reform agenda so as to make them feel committed and thereby develop the right capacity to do their job.

Why the Reform

Developed and developing countries recognize the fact that formal education is a prerequisite for growth and development and so they try to provide quality formal education for their citizens (Thompson, 1981). Studies from the more advanced countries notably the united states, Demark, Japan during the period of their economics growth and development, suggest that there had been a very significantly relationship between their citizens (Thompson, 1981). It is obvious that, when an economy of a country is able to provide the basic needs of its people, that country is said to be developed (Medic popovia, and Milanovic, 2009). So, every developing nation like Nigeria should continue the search for possible areas or ways to make her education system more relevant and to be self reliance. These various projects of searching opened the door to the establishment of a flexible functional system of basic education. By this provision, the general standard of living of its people is improved and sustained.

It is important to note that Nigeria is a developing country where low economy, low technology, low inventions and slow manufacturing of goods as well as poverty and unemployment are the daily experience of most people in the country. The indepth reflection of the above statement reveals to a great extent that our education needs to be reformed; the weaknesses of the economy which is characterized by economic mismanagement, high level of corruption, insecurity, weak infrastructure, heavy dept from International community, heavy dependant on oil as the major source of revenue, low capacity utilization of indigenous industries which led to their massive closure which in turn breed and ethnic upheaval. So many nations in the world faced this type of challenges before they gain their stand through the reform agenda in their various educational systems.

Some Nations Reform Agenda.

Serbia Nation: Is a small nation in the European community and was once isolated but now in its rapid and far-reaching transition that hope to become a member of European union in the near future. Their reform agenda focus on the area of adult education and training which is expected to underpin many of the stages of transition and transformation.

The basic education has special role in this process in relation to issues of employment and social inclusion. In 1980s Serbian Educators supported by UNESCO, started to develop models and programmes for the functional basic life skills.

Serbia as a nation, it is crucial to overcome these economic, political and social problems and move towards a successful integration with global developments; hence its 70% of the population is adult. So, adult education is recognized as a vital instrument to support the implementation of strategy documents and goals, particularly in terms of economic development. Although, primary education has been mandatory in Serbia for the past 50 years the country was facing literacy problem.

Considering certain data, adult education reform programme have started responding positive needs of the labour market and this empower individuals to acquire certain professional skills, for individual development and self fulfillment.

Then in almost all the developed nations in the world, one time or the other involved in re-engineering science education with different method for different purposes. In year 2002, the extent of this sense of irrelevance of science in Japan emerged from a nation wide survey students. According to Peter (Hackling and Ronnie, 2001) in (Peter 2007) found that, well over half of the secondary students, did not agree that the sciences at school, was relevant to one's health. This signified that, similar attitude must have been demonstrated in many other parts of the world. Japan breaks through this by well organized reform agenda before they got to their present position as one of the developed nations.

Ghana's formal education helps in the development of the individual and society but science education is regarded as the key that unlocks the door for rapid development of individual and the society to be self reliance (Thompson, 1981).

In a laudable effort of re-engineering science education, the accelerated development plan of education was introduced in Ghana in 1951, to make education available to every individual citizen in Ghana. Adult literacy campaign in Ghana was started in 1948 by Dr. Frank Laubach of the world literacy and Christian literature (Aggor, 1992). The result showed that beneficiaries of functional literacy classes could read, write, and do numerical calculation to some appreciable extent at the time of their completion of the course and this helps them in their trading activities and to be more self reliance in some other areas; and went a long way to reduce joblessness in the labour market.

Reform Agenda Programme in Nigeria

Nigeria as one of the developing countries in the world will not be an exception in the area of re-engineering science education to get rapid and far-reaching transition and move towards successful integration with global development. According to Alamina (2001), most researchers carried out at the university of Wisconsin-la cross, established that study of science was not taken as a Nation's interest. Individual's interest was on liberal arts with the claim that science was not all that relevant in public services, and it does not provide job opportunity in offices.

Aghenta (1981) and Jegede (2003) viewed that recognition of the importance of science and technology in the national development by Nigerians, was with much desire to develop fast in many areas. In view of this, Nigeria has a target of scientists and technicians that must be available by the year 2000 A.D. Base on this, the federal government got involved in students enrolment into universities (Aghenta, 1981; and shuaib, 1987). Science textbooks in various fields and of different types were made available in the bookshops and open market squares by the federal government. By 1981/82, enrolment for admission for science courses continued to rise yearly.

Then, the planners of the national policy on education to strengthen the re-engineering sciences education, envisaged a situation where all the elementary secondary and tertiary institutions will be totally transformed from liberal art institutions to science and technologically oriented institution with the availability of all required tools, materials and personnel needed to educate the learners. Afe Babalola (2012), if you want quality education and do not put the necessary facilities in place – laboratory, libraries, teaching aids – the quality of education will not improve or remain unimproved which consequently fail to develop individual and society that is meant for.

So along with the above, the country also realized the importance of tools and equipments. Obanya (1993) revealed in his work that in 1981 the national assembly

voted ₦50 million to educationally disadvantage states to aid them in the provision of science and technical equipments. Some states government offered incentives to science teachers. Graduates of science were readily absorbed or employed either by the federal or the state government; but these preferences are no more in existence.

Moreover, in 1982, 34 units of introductory technology workshop equipments were made available to each state by the federal government with the aim to make individual self reliance. Also, the federal government provided the equipment that would furnish one secondary school to the level of federal government college to each state. In the same year 1982, on the request of the national council on education; the federal government on behalf of the state placed order for introductory technology equipments from Czechoslovakia, Hungary and Bulgaria for all secondary schools in the country at a cost of 108 million naira Byrom, (1998) and they were judiciously distributed.

All the above were part of the various efforts taken by the federal government in re-engineering science education for her citizens to improve their knowledge for productivity to become self reliance. Despite this, in 1994, it is sad to find some equipments have not been delivered to some few schools. Some federal government owned colleges of education seemed not to have acquired the necessary infrastructure because of corrupt tendencies of official at various levels.

More importantly, majority of institutions that received their equipments kept them in the stores. So, undelivered science equipments to few schools and lack of installation of these equipments serves as constraints to rapid progress and the understanding of science by the learners and the aim of the government on education becomes difficult to be achieved.

Nevertheless, in Kogi central senatorial district, out of 45 secondary schools that received the supply of the equipments only 8 secondary schools were able to installed their own by their efforts.

Purpose of the Study

This study attempt to find out the various efforts of the federal government in re-engineering science education of her citizens to promote higher productivity and the individuals to become self reliance.

To find out the impact of few sampled schools where there were installations of the federal government supplied science equipments to their immediate communities.

To identity factors militating against success that Nigeria had in view but yet be achieved unlike Japan with huge success

Research Questions

The focus of this study is to find answers to the following research questions.

1. Is there any significant difference between the graduates from the few schools with installed science equipments and those from schools without installation of science equipments?
2. Is there any significant difference between the impact of the graduates from schools with installed science equipments and those from schools without installation of science equipments; on their communities?

Research Hypotheses

The following research hypotheses were generated and tested at.05 level of significance.

1. There is no significant difference between the graduates from the schools with installed science equipments and those from schools without installation of science equipments
2. There is no significant difference between the impact of the graduates from schools with installation of science equipments, and those graduates from schools without installation of science equipments on their communities.

Methodology

The research design was based on survey case study of 45 secondary schools in Kogi central. 37 being secondary schools that could not install the supplied science equipments while only 8 schools installed theirs.

The instrument for the study was a questionnaire. The sample size were 45 schools and one hundred copies of questionnaire were administered to science teachers and only 70 copies were collected and analysed descriptively.

To analyse the data, it was only t –test statistical method to find out the source of the difference and the significance.

The 45 schools were made into two groups; such as:

- Those schools where the supplied science equipments were installed belong to Group 'A'
- While those schools without the installation of the supplied science equipments belong to Group 'B'. So they will be refered to as such.

Result

To test the earlier stated hypotheses so, hypotheses 1and 2 was subjected to analysis of t-test. The data collected were to test the following hypotheses:-

Ho I: There is no significant difference between the graduates from the schools with installed science equipments and those graduates from schools without installed science equipments.

Table I: Comparison of the Mean Score on Secondary Schools That Installed the Science Equipments and Those Schools That Could Not Install Theirs

Variables	N	$\bar{X}$	SD	SE	Df	t-value	Critical value	p. value
Group 'A' schools	58	3.23	0.68	0.07	116	2.98	±1.98	.05
Group 'B' schools	12	3.75	1.26	0.28				

Significance at ≤ 0.05

Table I: showed that, the mean score of Group 'A' schools is higher than the mean score of Group 'B' schools; also, the obtained t-value of 2.48 which is higher than the critical t –value of 1.98. This indicates that, the difference between graduates in the two groups of schools 'A' and 'B' was statistically different. As a result, the null hypothesis is rejected.

Ho II: There is no significant difference between the impact of the graduates from Group 'A' schools and those from Group 'B' schools on their communities.

Table 2: Comparison of the Mean Score of the Graduates Impact from Group 'A' Schools and Those from Group 'B' Schools

Variables	N	$\bar{X}$	SD	SE	df	t-value	Critical value	p. value
Graduates from group 'A' schools	58	3.75	0.40	0.04			±1.98	0.05
Graduates from group 'B' schools	12	3.58	0.36	0.07	116	2.00		

Significant at $p \leq .05$

The mean scores of Group 'A' schools and those of Group 'B' schools were compared using the t- test statistics. The result is presented in table 2 above.

The statistical analysis in Table 2 above revealed that, graduates from the Group 'A' schools had a higher mean score of 3.75 compared to the graduates from Group 'B' schools with 3.58 only. The t-value obtained is 2.00 which is higher than 1.98 of critical at .05 level of significance and degree of freedom 116. The difference about the impact these two groups of graduates have on their communities is quite obvious. This consequently made the stated null hypothesis to be rejected. Therefore, there is statistically significant difference of the impact that the graduates from the Group 'A' schools have on their communities. These graduates seem to hold a more favourable impact on their communities than the other group of graduates.

Discussion

Going through the analysis above, the results of data analysis of this study has clearly revealed that, the graduates from the Group 'A' schools are capable to provide the needs of their people to be self employed.

The result of this study also revealed that, these Group 'A' schools graduates' minds are well trained towards understanding their roles in nation building most especially as contained in national education goals "to training of the mind in understanding of the world around, by this the country will definitely become a great nation and with dynamic economy.

One important aspect of those trained in Group 'A' schools, student's carried out practical activities obtain manipulative technical skills; ability to relate forms with functions; ability to perform simple experiments and draw inferences from results and other development training given in the laboratory and workshops made them to improve in their productivity. (Aramide, 1985).

Moreover, this research work supports the previous study at Wisconsin – La Cross, that training the learners with adequate equipments, that is how the science and technology could develop fast in many areas towards successful integration to become a great nation in the world.

Conclusion

From the result analysed, it proved that using science equipments in training the learners in a positive direction; will result to human resource management process that leads to enthronement of power planning process which is an integrated step aim at making an organization achieve its manpower objectives (Macfarlane, 2004). This will result to individual self reliance and consequently make the nation a great one.

So, re-engineering of science education, has much and greater achievement on every nation. Similarly, Tricia (1998) established in his work that; more exposure of students to science practicals promote learners' understanding.

Conclusively, the result above clearly demonstrated that psychomotor variables are as important as cognitive variable that concurrently play vital roles in learning science.

Finally, if more efforts of this Reform agender could be embarked upon annually by the Federal Government to Re-engineer science education, the skills offered will certainly match the current and future needs of national labour markets outlined in the national development document of the country.

Recommendation

The Federal government should try to repeat the buying of such science equipments to all the schools, colleges and Tertiary education in the country to continue with the good science mission.

Federal government have to set up monitoring body in each state to make sure that all the supplied science equipments should be installed by the state government and put into proper use.

Science curriculum developers should not expend their energy on the development of new programs but should spend more time in helping teachers to develop and improve their repertoire of teaching skills.

Condition of service for the implementers of this programme should be reasonably considered.

There should be proper and regular supervision on the use and maintenance of the science equipments; and that report from supervisors should be taken serious.

References

Alamina, P.T. (2001). *Science Technology and Society. Approach to science and Technology Education.* A paper presented at science-technology-society workshop held 21st – 26th May at the Rivers state college of Education, Port Hercourt.

Afe, Babalola (2012), Quality education with necessary facilities. *The Nation News paper; Monday 9th January,* pg 8.

Aggor, R.K. (1992), Developing relevant post – literacy curricular for neo-literates in Ghana. *Ghana Journal of literacy and Adult Education.* 1 (2), 167 – 182.

Aghenta, J.A. (1981), Why there are not enough science applicants for University admission in Nigeria. *STAN Journal,* 20, (1) Pg 56 – 59.

Aramide, S.A. (1985), Assessment of Practical Biology. What Examiners look for. *Journal Science Teachers Association of Nigeria.* 23, (1 and 2). Pg 17 - 21 Dec.

Byrom, E. (1998). *Factors influencing the effective use of technology for teaching* and *learning: lesson learned from the SEIR-TEC intensive site schools* [online]. Available: http://www.serve.org/seirtec/publications/lesson.html.

Ibraheem A.O. (2009), Efficacies of supervision on the academic standard of schools in Kogi State. *Journal of Educational Research and Development*.4,(1),13 - 18.

Jegede, O. (2003). A celebration of Teacher Education and Open and Distance Learning

(ODL) in Nigeria: attainments, challenges and strategies. In A.M. Muhammed and A. Omar (eds) *Teacher Education in Nigeria: past and present and future.*

Macfarlane, C.A. (2004). *Sped 535 integrated curriculum and methods for students with functional disabilities:* Retrieved from www education .ed. pracificu.edu./marcfarlane/courses/sped535/curriculum.ppt on 28th April, 2009.

Medic, M.; Popovic. K.& Milanovic, M.; (2009), 'Serbia : development and state of the art of Adult learning and education', *National CONFINTEAVI report, Adult* Education society, 2009.

Obanya, A.O.J. (2007). Drug abuse and social impacts in Nigeria. *Journal of studies on alcohol,* May 7(4),11 – 14.

Okebukola, P.A. (2002). *Issues in funding University Education in Nigeria*. A paper presented at the forum on cost and financing of Education in Nigeria; Education sector Analysis (ESA) September 17 – 19, Abuja.

Peter, (2007), in Hackling Ronnie (2001). *Journal of Education Research and Development*, 3, (3). pg. 62 - 64.

Peter, J.F. (1999), Student interest in science: The Problem, Possible solutions and constraints. *Journal of Science Education, Monash* University/QUT. 3 (2),109 - 114

Popovic, K. (2010), '*Demand and provision of literacy in South-East Europe', Regional perspectives on literacy: Policies, strategies and financing,* UNESCO, Paris, Lagos office Nigeria.119 - 24.

Thompson, A.R. (1981), *Education and Development in Ghana*. London: Macmillian educational Ltd.

Tricia, Y. (1998), *Student teachers' attitudes towards science* (STATS). Centre for Science Education, Sheffield Hallan University, Colleglate Crescent, a Shelffield S102BP.

UNESCO, (1983), *Summary of the International conference on Adult Education.* Geneva*:*UNESCO. Lagos office Nigeria.215 - 221.