

CONTRIBUTIONS OF RESEARCH AND DEVELOPMENT IN TECHNOLOGY AND VOCATIONAL EDUCATION IN NIGERIA

BY

OLUKA SUSSAN NGOZI

**DEPARTMENT OF TECHNOLOGY AND
VOCATIONAL EDUCATION
ENUGU STATE UNIVERSITY OF SCIENCE AND
TECHNOLOGY (ESUT), ENUGU**

Abstract

Research and development (R & D) perform very vital role in vocational education. It has contributed immensely in the area of technology and vocational education. This entails that most of the innovations of technology that influences people's life positively are results of concerted efforts of research and development. Therefore, the objective of this paper is to x-ray the contributions of R & D in the field of technology and vocational education. It was through R & D that man was able to manufacture products and provide services that facilitate communication, production of goods, preservation and construction work that made life easy for the populace. Also discussed in the paper include; types of research and the problems facing vocational and technology education which one of them is that of poor funding of the programme which is itself is a capital intensive programme. The researcher recommended that research information should be properly employed and redirected by the government for solving national and international problems.

1 Introduction

Research is an organised and planned process of finding solutions to problems through systematic collection, collation, analysis and interpretation of the relevant data and drawing of appropriate conclusions (Olaitan, 1999). Research also is an activity aimed at discovering new knowledge to be used in creating a new product, process, or service, or improving a present product, process or service, (www.crfonlone.orglore/glossorg).

Further, research and development according to the Organisation for Economic Co-operation and

Development (2010), refers to creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society. It is a systematic investigation or experimental risk, the outcome of which is either new knowledge (with or without a specific practical application) or new or improved materials, products, devices, processes, or services. They include basic, applied and all developmental activities that are supported at universities, colleges and other non-profit making institutions.

The aim of R & D is to gain knowledge, the use of resources for the deliberate discovery of new information and ways of doing things together with the application of that information in inventing new products or processes. They involve carrying out of testing of new products to determine their viability. An organization or institution is usually set up to oversee all the activities involved in research and development. In the same vein, Nworgu (2006) posited that research and development are institutionalised research programmes which aims at developing and testing the efficacy of products and services of an organisation. The aim of research and development according to him is that of developing and testing more efficacious educational products and services.

Research and development programmes are relatively new in Nigeria and as a result, information on it appears to be very scanty especially in the educational setting. Programmes on research and development affairs in Nigeria were organised and piloted by a research institution established and funded by the government. A typical example is the Nigerian Educational Research and Development Council (NERDC). This council sees that products, which may be textbooks, equipments or curricula are developed and field tested to ensure their effectiveness.

Research and development are costly and time demanding, and their programmes provide valuable means of achieving educational improvements. R & D ensure that educational products in use are of proven quality. Most products are simply introduced into the system without first ascertaining their efficacy. In another development, vocational education is a type of education that

ensure that one gain knowledge, skills and attitudes that fit him or her for entering or progressing in a socially useful occupation or vocation. According to Onoh and Onu (1999), vocational education in a broad sense is defined as part of the total experience of an individual whereby he learns successfully to carry on gainful employment on occupation. To appreciate the nature of vocational education, it is very important to understand the concept of academic or general education. According to Elobuike (1999), general education is a broad type of education aimed at developing attitudes, abilities and behaviours considered desirable by the society, but not necessarily preparing the individual for specific type of vocational or occupational pursuit. Vocational education may be organized or unorganised methods of securing occupational confidence, competence and proficiency. It is organised when the process of acquiring skills and right attitudes to enter and process in an occupation or vocation is carried out in a school setting. On the other hand, it is unorganised when the training of the individual in a particular trade or skill is carried out outside school environments such as the road side apprenticeship workshops.

Purposes/Objectives of Vocational Education

Nigerians have since recognised the need for vocational technical education, as an aspect of education that was reflected during the colonial era, and that was the reason why this type of education was seriously deliberated upon in the National Policy on Education of 1981. The objectives of vocational technical

Education as spelt out in National Policy on Education of (2004) are as follows:

1. To provide trained manpower in applied science, technology and commerce particularly at sub-professional grades.
2. To provide the technical knowledge and vocational skills necessary for agricultural, industrial, commercial grades.
3. To provide people who can apply scientific knowledge to the improvement and solution of environmental problems for the use and convenience of man.
4. To give an introduction to professional studies in engineering and other technologies.
5. To give training and impart the necessary skills leading to the production of craftsmen, technicians and other skilled personnel who will be enterprising and self-reliant, and
6. To enable our young men and women to have an intelligent understanding of the increasing complexity of technology

Therefore, if Nigerians should embrace the vocational education by investing heavily towards proper execution of the programmes, most of the problems and ills this country is passing through will be reduced to the barest minimum especially the unemployment and its palavia.

Effects of R & D in the Vocational Education

The purpose of a well articulated vocational education programmes is to aid individuals in discovering their vocational interests and in developing

their specific abilities needed for vocational success for the sake of the individual and the society (Onoh and Onu, 1999). The development of work skills of individuals is perhaps the foundation on which vocational education is laid. In any organized society or community, there is always a recognized pattern of introducing young people into the adult world and the world of work. Hence, there is always a pattern of inculcating in them those values and vocational skills which the community has learned in its history as well as what it wants them to be when they become adults. One of the means of inculcating those cultural values and skills to their young ones was through apprenticeship system of education. Through this means, cultural values and skills which the community is known for are being transmitted from one generation to another in an unorganized setting.

Moreover, in the manner and process of transmitting cultural values and skills change as technological innovations emerge. The world of work as we have it today is a world of science and technology. Various production tasks which were manually performed, have become mechanized and in some cases automated. New techniques, procedures, processes, devices and materials have replaced old ones, so much that productivity today depended upon science and technology as well as in developing appropriate human competencies. All these innovations and changes that are taken place in the field of science and technology are as a result of the consolidated research and development activities.

The efforts made through R & D enabled

individual to be equipped with skills, information, attitudes and useful habits which will enable him to live a successful life within the community. The individual will be equipped with knowledge and skills for earning income, enjoying leisure for full living and making contributions to improve the society by serving as investment in human capital. R & D in vocational education has gone a long way in successfully preparing persons for vocational and technical occupations requiring technological knowledge and skills in job operations as planning, control, maintenance, testing and production. The vocational and technical education programmes will be successful if new systems for the production of food, raw materials and mass productions of goods and services are created. It is through the process of R & D that this objectives of vocational education would be carried successfully.

Eyioche (2005) posited that R & D been a contribution to industrialization represents a deliberate and sustained application and combination of suitable technology, and other resources to move an economy from the traditional low level or production to a more automated and efficient system of mass production of goods and services.

Vocational education has been seen as the most effective weapon against poverty, unemployment and human progress. Vocational education is the greatest instrument more directly responsible for business, agricultural and industrial growth, and for the promotion of economic development of a nation. It follows that the economic status of any nation can be measured in the ability of that nation to supply its own needs, which

is the extent to which the nation is self-reliant. Self-reliance of a nation depend on her level of technological development which is dependent on the availability of trained skilled labour force to carry out their production of goods and services optionally.

Types of Educational Research and Development

Educational research in vocational education can be classified into four types. According to Nworgu (2006), they include:

1. Basic research - aims at producing scientifically exact knowledge. It is also called fundamental research which is merely concerned with producing results or findings that will lead to the development of theories. The concern of basic research is to build theories which will lead to advancement of knowledge in a particular field.
2. Applied research uses ideas and theories established in basic research to practical situations. Applied research is interested in testing ideas and theories and applying them in actual situations to determine their workability or usefulness.
3. Research and development programmes focus on projects that result in finished products, which may be textbooks, equipment or curricular. These projects are usually too demanding costly and time consuming, but it provide valuable means of achieving educational improvement. R & D ensure that educational products

- in use are of proven quality.
4. Action research is concerned with solving specific educational problems for a particular group of respondents. This type of research may either be taken by a teacher or group of teachers to solve educational problems in the classroom or in a school. Since this type of research is carried on a particular group, its results are not generalised to other situations.

Utilization of research information for development and application.

Utilizing research information according Olaitan (1999) involves the practical application or research results for various purposes like,

1. Solving curriculum problems such as curriculum appraisals, reviews and developing new ones.
2. Serving in the understanding of specific areas of specialty disciplines.
3. Developing and continuously increasing the pool of relevant data.
4. Advancing knowledge that would promote progress and facilitate individual interactions with the environment.
5. Working on educational investments and returns.
6. Stimulating further research in diversified areas of education and development.
7. The provision of basic training for those involved on problem solving approaches for educationally and developmentally related problems.

8. Efficient administration and management of education
9. Maintenance and utilization of teaching and learning facilities.
10. Accountability of investment in education and responsibility for learning outcomes.
11. Assess the relevance of programme outcomes to job opportunities for national development.

He emphasizes that numerous research information are not utilized as they are stored away in the libraries, micro-films, computers and therefore made inaccessible for utilization for development. Very significantly is the dearth of centres specifically for research and development, and research information utilization for solving national problems. The centre in Nigeria is known as Nigerian Educational Research and Development Council (NERDC). This council was established by an Act No. 53 of 1988 and it had six academic centres which include:

Book development centre
Curriculum development centre
Language development centre
Library and informatics centre
and Special programmes centre

All these centres perform numerous statutory functions of the council.

Problems in Vocational-Technical Education Research

The problems encountered in vocational education research could be attributed to certain factors. Brandon (1969) identified the following general problems related to research in vocational and technical field. They are

1. Vocational and technical administrators are frequently not

research prone', that is, they are often inexperienced as to the problems of organising, operating, and evaluating a research programme.

2. Research in vocational and technical education is of relatively recent origin. Before some degree of sophistication could be achieved in and among the various specializations of this field, considerable research had become interdisciplinary. Each discipline has different research techniques, methods, terminology and jargons of disciplines which are not well understood and are not acceptable by other disciplines. To reach agreement among the interdisciplinaries becomes a problem.
3. The ratio of supply to demand of research personnel is critically out of balance in the vocational and technical areas. Any increase of funds for the preparation of research personnel is a step in the right direction.
4. Problems of research information utilization. Most of the time, research information specially in the area of education are usually not utilized or under utilized for development purposes thereby creating wastage.

Roles of Research and Development in Solving the problems of Vocational Education

Vocational educators have recognized that research is one means of providing answers to problems of the local, state and national levels.

Evans and Bradon (1965) describes several functions of educational research that should help the vocational educators to recognize the role of research in answering questions and finding the solution to problems. Such functions are as follows;

1. To provide answers to operational questions
2. To assess educational programmes, practice and materials
3. To build up a body of information about educational enterprise.
4. To provide the outlook, stimulation and guidance for innovation, and
5. To develop valid theory about educational processes.

Conclusion

From the foregoing discussions on research and development in vocational education, much were yet to be done in the field and research information was generally under utilized for national development. Funding of research projects was poorly handled by the government and that created lots of problems in research and development.

Recommendations

The following recommendations were made:

1. Vocational education practices should be continually challenged, evaluated and redesigned to be up to date in the continually technological changes around the globe.
2. Vocational educators should effect progressive change, in that case, schools and departments must possess the ability to adapt meaningful to proven innovative practices.

3. Research and development council should be instituted solely for vocational research, to change vocational education for better. This council should work together with researchers, educators and citizens to build a profession of education relevant to the times.
4. Research information should be properly employed and redirected towards solving national problems

References

- Brandon, G.L. (1969). *Vocational and Technical Education*. In Encyclopedia of Educational Research (4). Macmillian Publishing Company.
- Elobuiké, H.U. (1999). Foundations of Technology. *Unpublished Mimeograph*, Department of Technology and Vocational Education, ESUT, Enugu.
- Evans, R. & Brandon, G.L. (1965). *Research in Vocational Education*. In Vocational Education 64th Yearbook, NSSE, Chicago: University of Chicago Press 60 - 263.
- Eyiuche, A.C. (2005), *Economic Problems and Development Programmes and Policies of Nigeria*. Enugu Nigeria Diamond Publication.
- Federal Government of Nigeria (2004). *National Policy on Education*, Lagos: Federal Ministry of Education.
- Nworgu, B.C. (2006). *What is Educational Research: Basic Issues and Methodology*. (2nd ed), Nsukka: University Trust Publishers.
- Olaitan, S.O. (1999). *Research Information and Utilization for Development and Effect on Mission of the National Policy on Education*. **Journal of Nigerian Educational Research Association** 2 (13), 1-4.
- Onoh, C.E.C. & Onu, F.M. (1999). *Vocational Education; Concepts, Nature and Purposes*. Fundamentals of Technology and Vocational Education, Enugu: Cheston Publishers.
- www.crfonline.org/a/rc/glossary/r.html
Definitions of Research and Development on the Web.