

Research in Vocational and Technical Education for National Growth and Development: Prospects, Problems and Remedial Strategies

Uguru Chike (Ph.D.) and Abdulmutilib, G.D
Department of Vocational and Technical Education
Ahmadu Bello University, Zaria, Nigeria.

Corresponding Author: Uguru Chike (Ph.D)

Abstract

This paper discussed the low level of research in developing countries and its negative impact on her level of growth and development. It highlighted the great potentials of research in education, particularly vocational and technical education, in attaining national growth and development; its problems and strategies for pragmatic researches to drive national growth and development. Research endeavours in developing countries is limited by inadequate financing, inadequate or poor infrastructures, poor and obsolete facilities, difficulty in accessing top-rated journals, lack of mentorship, poor remuneration of researchers among other factors. The paper upholds the view of many authors that urgent steps need to be taken to address the above limitations of research by government and other stakeholders, and that there should be a paradigm shift of attention to young researchers/scientists who holds the key to future research in the continent. Properly planned, executed and implemented researches will lead to better service delivery, cost benefit production of goods and services, bouyant economy, safer environment and improved living standard of citizens through use of new knowlegde and application of technology. The paper suggested that scientists/researchers be encouraged through proper mentorship, financial support/grants, provision of relevant equipment and materials for research, good policies to boost research, integration of scientific writing and publishing principles in the undergraduate and postgraduate programmes as strategies for encouraging more research efforts in developing countries.

Keywords: national growth and development, educational research, vocational and technical education.

INTRODUCTION

According to the Oxford learners' dictionary the word research can be defined as an (uncountable) diligent inquiry or examination to seek or revise facts, principles, theories, applications etc. It further defined research as a laborious or continual search after truth. The above highlights the major characteristics of research which include the progressive nature of research and diligence required in such inquiries in order to come up with findings that will profit mankind, make life more meaningful with little or no negative effects on man and his environment.

The above definitions also portray research as a venture/exercise for "honest and determined" minds who will apply their body and soul to the task of research (without giving up) until it is pursued to its logical and conclusive end. The main purpose of research mostly (if not always) should be to improve life of mankind and his environment, to make life more meaningful and for better/sustainable environment. That is to say that studies or searches conducted outside the above positive ends may not really be seen as research vis-a-viz the survival of man and his environment.

Educational Research

The term educational research can simply be defined as application of research in the field of education to simplify the processes of the educational activities and for improvement in the productivity of beneficiaries of the educational system and the larger society. Milner and Senker (2000) defined university research as the original investigation undertaken to acquire new knowledge in the natural sciences, social sciences and humanities. It is a basic tool for human development and through it countries are developed and advanced in high technology (Osagie, 2012).

Osagie (2012) further observed that in order to cope with global competitiveness, acquisition of new knowledge through research is inevitable. This is because advancement of any economy is directly linked to the performance of its industries: and performance is a function of advancement in science and technology which cannot be achieved without some research. There are different kinds of educational researches namely: experimental, observational, quasi-experimental, opinion studies etc. A good educational research should attempt to find solution to identified problem(s) for the good of mankind, the society and the environment in an orderly manner which includes: introduction of the

study, its objectives, review of previous studies, relevant methodology, analysis of data, and interpretation of result from the analyzed data, conclusion and recommendations.

Importance of Educational Research

Research has many benefits to man and his society. It has the potential to change Nigeria from a consuming nation to a nation that can develop products for local consumption and export. This will reduce her dependence on other countries for manufactured products with its many dangerous consequences on the economy and the citizenry. In line with the above observations, World Bank (2002) posited that the ability of any society to produce, select, adapt, commercialize and use knowledge is critical for sustained economic growth and improved living standards: it is the most important factor in economic development. Osagie (2012) added that the major drivers of Nigerian economy: agriculture and the manufacturing industries are becoming weaker continuously but this ugly trend can be changed or reversed by research. Research can be of great benefit to teachers in many ways, helping them to become effective and pragmatic in their lesson delivery, administrative responsibilities and in the delivery of numerous community services. Osagie (2012) observed that research is necessary for didactic classroom teaching; lecturers need to gain new knowledge to cope with the complex issues they face by regularly seeking new information. Pursuit of knowledge through research is a must for academics, because acquisition of knowledge is forever ongoing, it is never static (Osagie, 2012). The above position agrees with the belief that when one stops learning the person start dying. Ramsden (2003) listed the following as the importance of research to teaching and teachers:

- Research influences lecturers by making them to be aware of latest developments in their field and it reflects issues in their course materials through developing or applying new teaching methods to be effectively delivered for students learning purpose.
- Research revitalizes lecturers, thereby enabling them to identify effective teaching and learning methods. It among others, help lecturers to apply research findings to their own instruction to become effective change agents.
- Involvement in research provides lecturers with a means for curriculum development. Research will lead to development of school curriculum that will be designed to produce experts who will effectively tackle the problems of a country. Overall, this will lead to the development of an educational system that is functional and tailored to solve national problems. In addition to the above, benefits of research to teachers Reed *et al.*,

(1992) added that engagement in research enables lecturers to increase their interaction with students and to more effectively evaluate students' needs.

Advances in the Field of Research

Researchers in Nigeria and their counterparts in other countries have made numerous breakthroughs in many fields of human endeavors through research. A good number of such breakthroughs have been documented and preserved for the use of the present and generations to come. Example through research activities (in the field of agriculture) man has been able to develop better species of plants and animals like: more nutritious, early maturing cultivars and breeds of plants and animals, those with ability for higher yield, resistant to diseases and with ability to thrive in different climatic conditions etc. Nigeria as a nation and indeed Africa as a continent are still far behind on the ladder of research advancement. Brenner (2008) observed that while developed countries have been harvesting the technological spin-offs of scientific knowledge from research for national development and wealth creation, the case is different with developing countries.

Similarly, Griliches (1979) and Kothari (2004) observed that though research is important in development and productivity growth of any nation, in Africa there continues to be little investment in research. For example, in 2011, when worldwide expenditure on research was 1.77% of the total global gross domestic product, Kenya spent 0.1% of its GDP and South Africa spent 0.76% of its GDP on research (Smith *et al.*, 2015; Tamar, 2014). According to Olukoju (2002) declining investment in research has been cited as a reason for deteriorating research quality in Africa as a continent. Olukoju (2002) further observed that in medicine, only 10% of research is performed in developing countries and only 2% of the 3000 journals from developing world are listed in Medline. Njuguna and Itegi (2013) observed that researchers in Africa have tended to prefer synthetic (research that does not venture into unknown) rather than creative research that leads to innovations. They mainly concentrate on gathering and integrating what has already been done by others. This approach suppresses creative research in which the researcher executes innovatively and imaginatively though referring to others to produce new ideas and practices.

In the same vein Cruz-Calderón *et al.*, (2015) observed that most Ebola research has been conducted in America instead of in Africa or by Africans where the disease is found. The situation with Nigeria appears to be worse, Osagie (2012) reported that evidence of studies on the federal government funding of teaching and research equipment in Nigerian universities is not available.

This author attributed the slow pace of development in Nigeria to her very low investment in research in her tertiary institutions. Nigeria as a nation is paying dearly for her neglect and lip-service to research. Osagie (2012) lamented that Nigeria has not been able to solve her major problem (energy) since independence notwithstanding her endowment with solar energy, gas resources, coal, wind and geothermal energy. Also, her abundant solid mineral resource is poorly tapped, all because the educational system has failed to produce needed manpower to explore and exploit these minerals.

Culture link (1996) also lamented that more than fifty years since crude oil was discovered in Oloibiri, the Nigeria educational system cannot produce professionals to process the crude oil into petrol, diesel, kerosene and other by-products. According to this source, presently the oil industry in Nigeria is dominated by foreigners, while Nigeria finds it difficult to meet a mere 40 per cent local content participation. To further project the consequences of neglect to research, Osagie (2012) lamented that the eastern states are devastated by soil erosion, while the northern states are ravaged by desertification and coastal states like Lagos by flooding annually with severe consequences. Universities in these regions should develop homemade curriculum to address these problems; also Nigeria should develop her space technology by developing curriculum through research to study space technology in her tertiary institutions (Osagie, 2012).

The import of the above findings is that Nigeria as a nation should wake up and take advantage of research to solve her many problems through sincere promotion and support of research activities. Nigeria can learn from Asian countries that through deliberate overhaul of her educational system and targeted research have been able to transform from poor to wealthy and globally competitive countries. UNESCO (2006) observed strongly that research is of critical importance for development and should be supported by public money. Afolayan (2015) reported that the statistics on government funding of education in Nigeria from 2009-2013, showed a consistent decline in funding pattern from 2010 to 2013. The situation does not seem to have changed at present time.

Characteristics of Good Educational Research/Researcher

For research to fulfill its expected roles and meet the needs of mankind in different climes, it must be approached conscientiously and in an organized manner. Research must not be undertaken just for the sake of it, it should be used to solve myriad problems facing the Nigerian public. The following are therefore, the common characteristics of a good and bad research (Guide to Research, 2014):

- It is based on the work of others
- It can be replicated and should be doable (researchable)
- It is generalisable to other settings
- It should be based on some logical rationale and tied to theory. In a way that it has the potential to suggest directions for future research
- It generates new questions or is cyclical in nature
- It should be progressive or incremental
- It should address directly or indirectly some real problem in the world
- It should clearly state the variables or constructs to be examined
- It should be valid and verifiable; such that whatever you conclude on the basis of your findings is correct and can be verified by you or others
- The researcher should be sincerely interested and/or invested in his research.

Conversely, the following are the characteristics of bad research:

- It is the opposite of what has been discussed above
- It looks for something that cannot be found
- It plagiarizes other peoples' work
- It falsifies data to prove a point
- It misrepresents information and misleads participants.

Mule (2016) listed the following as the characteristics of a good researcher:

- Has an analytical mind
- Is friendly and a people person
- Has the ability to stay calm
- Is an intelligent person
- Is a curious personality
- Is a quick thinker
- Is a committed person
- Has good written and verbal communication skills
- Is sympathetic and a good listener
- Is systematic and meticulous in his approach to issues/assignments.

Major Challenges of Research/Researchers

Researchers in Nigeria and other 3rd world countries are faced with many problems, chief among them are:

- Financial constraints: Njuguna and Itegi (2013) observed that financial constraints impact virtually all aspects of research including its mission, processes, participants' integrity, as well as dissemination of research findings. Okecha (1988) also observed that developed countries like United States, Canada and European countries believe in research and development (R &D). Consequently, they

invest heavily in it. The evidence of their huge expenditure in R and D is the enhanced and enviable level of industrialization, economic prosperity and self-reliance being enjoyed by their citizens (which most African countries lack). In addition to paucity of finance for research in many African countries, public utilities such as electricity, communication system, water, sanitation and transport network are either lacking or in deplorable state (Njuguna & Itegi, 2013).

- High cost of research facilities: Researchers in Africa are faced with the problem of costly and obsolete facilities. Many laboratories are crippled and dysfunctional because prohibitive cost of spare parts has frustrated efforts to replace worn-out or broken laboratory facilities. Also available research institutions have poor libraries and documentation centers. Generally poor research facilities have for a long time been attributed to poverty that hinders African governments from providing institutions with equipment and infrastructure for effective research (Njuguna & Itegi, 2013).
- Heavy teaching loads/lack of incentives to research/insufficient time.
- Lack of human resources/low research capabilities.
- Poor access to top-rated journals.
- Weak collaborations/networks of researchers.
- Weak collaborations with stakeholders/users.
- Poor ethical based culture.
- Lack of support to researchers.
- Low remuneration of researchers.
- Insufficient mentorship of young researchers. Most young researchers lamented that support needed from mentorship from senior researchers may be difficult to access as most potential mentors are too busy with their work to have time for junior researchers.
- Lack of administrative support to researchers etc.

The Future of Research in Developing Countries

According to Friesenhahn and Beaudry (2014), the future of research in Africa rests in the hands of its young scientists. These authors lamented that little is being done to support young scientists in Africa. Also Njuguna and Itegi (2013) suggested that efforts in research should start early in primary and secondary schools where students learn basic principles and engage in simple projects. These authors also suggested that at the university level teaching and supervision of students should be assigned to experienced professors.

Research interests in young people can be developed through different ways, namely:

- Creating avenues for young researchers to meet and interact with older researchers.
- Involvement of young minds/scientists in classroom discussions about scientific methods through which knowledge is generated.
- Allowing them to interact with relatives who earn their living through research.
- Through job placement, example those who are lecturers in tertiary institutions must be involved in research and publication of their research findings for promotion and enhanced emolument.
- Young minds can also develop interest in research if their parents or other significant others tell them stories of great researchers or allow them access to their biographies.

Strategies for Encouraging Research among young Researchers

Specifically, young researchers and scientists can be encouraged to participate more in research using the following strategies:

- There should be constant mentorship and training. One female respondent pledged to do more research “once she publish one paper, she will have confidence to do more research in order to publish more”.
- Experienced researchers should mentor young scientists to be like them rather than just use them to generate their data. In addition, issues of scientific writing (and) publishing should be integrated in the formal undergraduate and postgraduate programs.
- Young researchers should be supported with suitable equipment and mentorship to develop their ideas.
- Grants targeting young researchers should be in place and made accessible to them; also more opportunities for PhDs at younger ages should be encouraged. Capacity building courses should be integrated in the grants for young researchers (where necessary).
- Policy makers should be made to understand the link between research and development. They should therefore design policies to support scientists/researchers especially the young ones.

Economic Growth and Development Indices/Parameters

Economic growth of an economy is demonstrated by an outward shift in the Production Possibility Curve (PPC) of that economy. It can be defined as the increase in a country's total output or Gross Domestic Product (GDP). Simply put it is the increase in a country's production. On the other hand, a country's

economic development is usually shown by an increase in citizen's quality of life. "Quality of life" is often measured using Human Development Index (HDI), which is an economic model that considers intrinsic personal factors not considered in economic growth; such as literacy rates, life expectancy and poverty rates. According to Mohammed (2019), national development is the ability of a country to improve the social welfare of the people by providing social amenities like quality education, good medicare, potable water, transportation and infrastructures. National development also involves improvement in the environment of a country in order to better the quality of life of the citizens of a country. In a nutshell, the basic idea of national development is growth in human and national resources (Mohammed, 2019). Mohammed (2019) further observed that national growth and development in developing countries is negatively impacted by over population, urbanization, poverty, lack of quality education, rising level of unemployment, poor state of infrastructures, rural stagnation among other factors.

Theories of Growth and Development

Just for mention, the classic theories of economic development can be discussed under 4 approaches, namely:

- The linear-stages growth model (Rostow's stages of growth and Harrod-Domar growth model)
- The structural change pattern theories
- The international-independence theories
- The neo-classical (counter-revolution) theory.

For the purpose of this study, the following are indicators of growth and development according to Agarwal (2019):

Growth occurs when:

- There is a discovery of new mineral/metal deposits.
- There is an increase in the number of people in the workforce or the quality of the workforce improves. Example: training and education.
- There is an increase in capital and machinery.
- There is an improvement in technology.

Development occurs when there is:

- An increase in real income per head – GDP per capita.
- An increase in levels of literacy and education standards.
- Improvement in the quality and availability of housing.
- Improvement in levels of environmental standards.

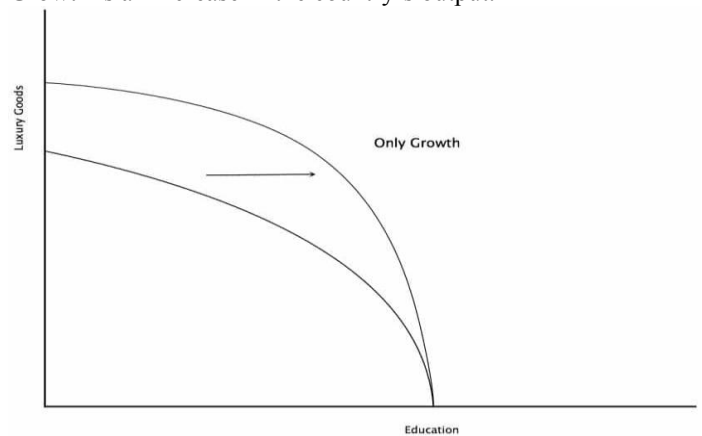
- Increased life expectancy.

Difference between Economic Growth and Economic Development

We can also have a situation where there is growth and development, i.e. increase in luxury goods and education. Development alleviates people from low standards of living into proper employment with suitable shelter. Economic Growth does not take into account the depletion of natural resources which might lead to pollution, congestion and disease. Development, however, is concerned with sustainability which means meeting the needs of the present without compromising future needs. The difference between economic growth and development is illustrated with the following graphs:

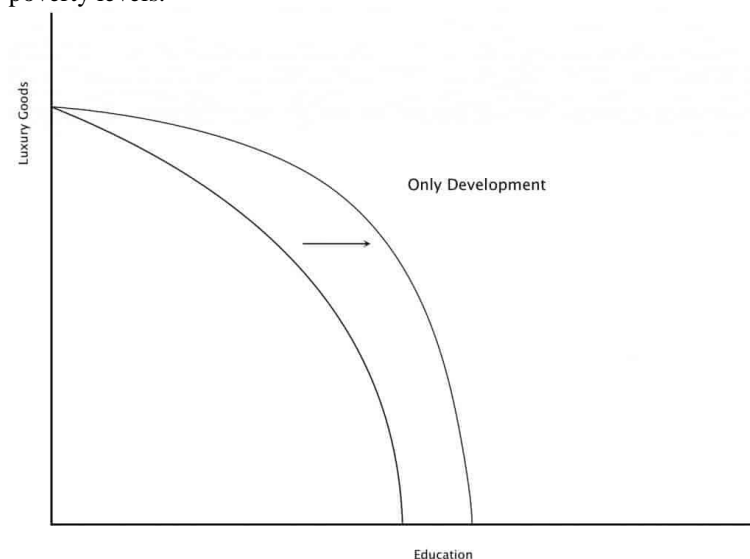
A. Economic Growth

Growth is an increase in the country's output.



B. Development

Development is an improvement in factors such as health, education, literacy rates and a decline in poverty levels.



Change in Development

Role of Research in Achieving National Growth and Development

The important role of properly planned, executed and implemented research in all fields of human endeavors cannot be overemphasized. Technical and Vocational Education Training (TVET) is a type of education with the primary aim of equipping beneficiaries with saleable skills to enter into the world of work and make progress in it. Its branches include: agricultural education, business education, home economics education, technical education, fine and applied arts etc. Research in vocational and technical education can help Nigeria and by extension other developing countries solve the problems behind her slow rate of development. According to Mohammed (2019) researches in various branches of technical and vocational education is needed to help citizens contribute to the growth and development in their fields of endeavors and the society/nation at large. Properly designed, executed and implemented researches in all branches (scope) of vocational and technical education will enhance growth and development of nations via better approaches to production and higher production in all areas of national life. In line with this view, Mohammed (2019) observed that economic growth of any nation is driven by the level of her technological and scientific development, quality of education, agriculture, transportation, infrastructures, medical care for citizens and food security. All of the above depends on research for the relevant knowledge, ideas and skills to drive them effectively.

Odia and Omofonmwan (2013) summarized the role of research as follows:

- Increased productivity,
- enhanced socio-economic wellbeing,
- enhanced income,
- infrastructural development,
- employment opportunities,
- Enhanced quality of local produce for both local and foreign markets etc. In a nutshell, research leads to the discovery/development of better ways of doing things (or improvement of existing approaches to doing things) for better and more profitable results.

CONCLUSION

A change of attitude by all stakeholders: governments, organized private sector, employers of labor, tertiary institutions, donor agencies, NGOs, parents and religious and socio-cultural organizations in words and actions in support of research should be our focus and commitment.

This calls for more funding of our tertiary institutions, provision of relevant equipment, facilities, infrastructures and other enabling environment for meaningful and profitable research.

In addition, there should be regular and proper documentation, monitoring, evaluation and revision of research activities nationwide; to make researchers more accountable and to meet the needs of the society that is always changing. The time to do so is NOW!

REFERENCES

- Afolayan, F.O. (2015). Funding Higher Education in Nigeria. *IOSR Journal of Research & Method on Education (IOSR-JRME)*, Vol. 5, Issue 1 Ver. 1 (Jan-Feb): 63-68.
- Agarwal, P. (2019). Economic Growth and Development Intelligent Economist. <File:///F:/Economic Growth And Development 5.htm>. Downloaded on Mon. 10th June, 2019 @ 9:57 A.m.: 1-7.
- Brenner, S. (2008). The Impact of Science on Society. *Science*, 282 (5393), 1411-1412. ___
- Culturelink.(1996). Basic Facts about Nigeria. Federal Ministry of Information, Lagos, Nigeria: 1-3.
- Cruz-Calderón, S., Nasner-Posso, K.M., Alfaro-Toloza, P., Paniz-Mondolfi.A.E., & Rodriguez-Morales, A.J.(2015). A bibliometric analysis of global Ebola research. *Travel Med Infect Dis*{Internet} 2015 Mar; 13(2):202-204. {cited 2015 Oct. 10}; Available from: <http://linkinghub.elsevier.com/retrieve/pii/S1477893915000344>.
- Friesenhahn, I and Beaudry, C. (2014). “The global state of young scientist”: project report and recommendations. Berlin: Akad-Verl; 2014. Ed. 1/2014:63.
- Griliches, Z. (1979). Issues in Assessing the Contribution of Research and Development to Productivity Growth. *Bell J Econ* {Internet} 1979 Apr 1;10 (1): 92-116. {cited 2015 Nov 3}; Available from: <http://www.jstor.org/stable/3003321>.
- Guide2Research. Top 10 Qualities of Good Academic Research. Posted on February 12, 2014 in Research Blog, Tutorials. <File:///F:/Good Research Qualities 1.htm>. Downloaded on 6/10/2019@ 9:59 AM:1-6.
- Kothari, C.R (2004). Research Methodology: Methods and Techniques {Internet} New Age International. 2004 {cited 2016 Sep 5}:30. Available from: <https://books.google.mw/books>.
- Milner, J., and Senker, J. (2000). International Approaches to Research Policy and Funding University Research in Different National Contexts. University of Sussex, SPRU, Science and Technological Policy Research.

- Mohammed, A.Z. (2019). Research in Vocational and Technical Education for National Development. A Paper Presented at the 12th Annual National Conference of School of Vocational and Technical Education. Federal College of Education, Zaria; 11-13th June, 2019: 1-9.
- Mule, D.V. (2016). What are the characteristics of a good researcher?.Mhtml:file:///:\Good Research Qualities 2..mht. Downloaded on 6/10/2019:1-18.
- Njuguna, F., and Itegi, F. (2013). Research in Institutions of Higher Education in Africa: Challenges and Prospects. *European Scientific Journal*. Dec. 2013/special/edition vol.1. ISSN: 1857-7881 (print), e-ISSN 1857- 7431.
- Odia, L.O. and Omofonmwan, S.I. (2013).*Research and Development Initiatives in Nigeria: Challenges and Prospects*. Mediterranean Journal of Social Sciences.Published by MCSER.CEMAS. Sapienze University of Rome. Vol.4. (2):257-265.
- Okecha, S.A. (1998). *Science in Africa*. Lagos: Stirling-Holden Publishers (Nig) Limited.
- Olukoju, A. (2002). 28th Annual Spring Symposium. Dakar, Senegal: 2002. The crisis of research and academic Publishing in Nigerian Universities: the twentieth century and beyond.
- Osagie, R.O. (2012). Financial Allocation and its Utilization in the Science Laboratories, University of Benin, Edo State, Nigeria. *European Journal of Educational Studies*, 4(2):291-299.
- Ramsden, P. (2003). *Learning to Teach in Higher Education*. Routledge Flamer, London.
- Reed, C., Mergendoller, J., & Horan, C. (1992). Collaborative Research: A strategy for school improvement. Crossroads: *The California Journal of Middle Grades Practice*.
- Smith, G.K. (2008). *Academic Writing and Theological Research: A Guide for Students*. Johannesburg: South African Theological Seminary.
- Tamar, K. (2014). SA's spending on research and development "to improve" {Internet} Business Day Live. 2014 {cited 2016} May 12}. Available from:<http://www.bdlive.co.za/national/science/2014/04/09/sas-spending-on-research-and-development-to-improve>.
- UNESCO.(2006). *Forum on Higher Education Research and Knowledge*.29th Novemeber-1st December, Paris, France.
- World Bank (2002).*Constructing Knowledge Societies. New challenges for tertiary educators*. The World Bank, Washington.