



Influence of Science and Technology Education Research- Driven ... Ankeli, G. O. (2026)

Influence of Science and Technology Education Research-Driven Economy on the Implementation of Renewed Hope Agenda of the Federal Government of Nigeria

ANKELI, Gabriel Odeh

gabrielodehankeli@gmail.com

Department of Physics, College of Education, Oju, Otukpo, Benue State, Nigeria

Abstract

Science and technology education research plays a fundamental role in real economic growth and transformation, wealth creation and improvement of quality of life in any nation. Based on this premise this study examines the concept of science and technology education; research driven economy and its role in accelerating the implementation of the Federal Government Renewed Hope Agenda at the different segments of economy such as, healthcare delivery, water supply, environmental management, transportation, security and safety, poverty alleviation, agriculture, rural development, food security, clean and affordable energy and education. The study observed that the gap between developed and underdeveloped countries can largely be attributed to differences in science and technology education, research and development and the difficulty in their application. When properly harnessed, education, research and development synchronously represent a triple helix for advancing the frontiers of sub-national and national development. The study recommends that concrete steps could be taken to create the needed environment for research activities in the country by government. The provision of basic infrastructure and facilities, which goes hand in hand with increased budgetary allocation to the educational sector and research specifically, has become imperative.

Key Words: Renewed Hope Agenda, Science and Technology Research

Introduction

There is absolutely no doubt that humanity and society have made tremendous progress since the introduction and adoption of education as a catalyst for developing and harnessing the human capital input. History is replete with the actions, struggles and the efforts made by man to improve his well-being through constant enquiry into phenomena, exploration of the environment and the exploitation of natural resources contained therein. The transition from the stone age to the iron age, the invention of agriculture, the advent of traditional and modern technology, developments in natural and health sciences, communication and energy have all been attributed to knowledge and to education (Alhassan and Abdullahi, 2013). From age to age, man has sought to improve his living condition by ordering and mastering his environment and has succeeded due mainly to improvements in the methods and scale of the acquisition of knowledge and its application. This paper examines the concept of science and technology education research driven economy and its role in accelerating the implementation of the Federal Government Renewed Hope Agenda at the different segments of economy.

Concept of Science and Technology Education Research

Nwakaire and Nnorom (2015), described research as a process of steps used to collect and analyze information to increase our understanding of a topic or issue. The three steps include posing a question, collecting data to answer the question, and presenting an answer to the question. Research is an information tool about the behaviour of phenomena in any sector of the economy. In particular, it is the process by which we seek to observe and describe, explain, predict and control the behaviour of phenomena. Science research therefore is a special type of research that can provide scientific communities and decision-makers with useful recommendations and possible actions for resolving



Influence of Science and Technology Education Research- Driven ... Ankeli, G. O. (2026)

fundamental problems (Rosowsky, 2022). Such research provides policy-makers with pragmatic, action-oriented recommendations for addressing an issue, question, or problem. Research especially science and technology research could be define as a way of going about finding answers to scientific questions, collection of methods people use to produce knowledge, an exciting process of discovery. It therefore requires persistence, accuracy, generalization, personal integrity, tolerance for ambiguity, interactions with others and pride in doing quality work. Echono (2023), defined research as an ongoing process and the end of one study often stimulates new thinking and fresh research questions. Although much important research occurs in colleges, universities and research institutions, however research is being conducted in many other places for many purposes. In private industry, people in market, personnel, public relations and management conduct research as for many government agencies to help them better plan or deliver services. Research at any level is undertaken to: explore an idea, probe an issue and solve a problem. According to Anaeto, et al (2016), research, in its broadest sense, includes any gathering of data, information and facts for the advancement of knowledge.

Federal Government Renewed Hope Agenda

The current government of President Bola Ahmed Tinubu rolled out the renewed hope agenda of his government to address issues on the following sectors; national security, economy, agriculture, power, oil and gas, transportation, education, healthcare, sport, youth and women empowerment among others, to enable it develop the nation. Over the last few decades Nigeria as a nation has gone through several development agenda to reform the economy. Before the 1980s, the reforms were purely in the form of extended national perspective plans that attempted to mobilize human, material and natural resources of the nation to achieve goals of national life. These national plans were the 1962-1968 Plan, the 1970-1974 Plan, the 1975-1980 Plan, and the 1981-1985 Plan. Often, these Plans went beyond mere economic prescriptions to address social, human and political goals with short-comings which necessitated reform through stabilisation/austerity measures. Due to the short- comings of the previous development plans/programmes, Babangida administration in 1986 introduced Structural Adjustment Programme (SAP) to address the fundamental and structural imbalance in the economy, diversify the economy, strengthen the currency, and build a viable, sustainable industrial infrastructure upon which real economic growth and development can be founded. The reform exercise rested on a tripod of measures: *Liberalization* of foreign exchange transactions, *Rationalization* of public sector agencies and parastatals, and *Optimization* of the capacity for domestic production and stimulation of non-oil exports.

After, the Structural Adjustment Programme (SAP), is the Vision 2010 which was introduced by Abacha administration in 1998. The aim was to “develop a blueprint that will transform the country and place it firmly on the route to becoming a developed nation by the year 2010” (Vision 2010 Report, 1998). The general objective was to transform the country into “a united, industrious, caring and God-fearing democratic society, committed to making the basic needs of life affordable for everyone, and creating Africa’s leading economy”. In 2004, the Obasanjo administration introduced NEEDS - National Economic Empowerment and Development Strategy. The NEEDS reform programme rested on four key strategies (NEEDS, 2004): Reforming Government and Institutions, Growing the Private Sector, Implementing a Social Charter, Value Re-Oriented. After the NEEDS, there was an introduction of 7 point Agenda of Yar’Adua administration, vision 20:2020, transformation agenda of the Jonathan administration, the government of change by the Buhari administration. As good as some of these development agenda were, there was little emphasis on research and development which is very necessary both at the formulation, implementation as well



Influence of Science and Technology Education Research- Driven ... Ankeli, G. O. (2026)

as at the monitoring and evaluation stage. Nigeria Vision 20:2020 (p. 102) recognizes Research and Development (R & D) as key to global competitiveness. Similarly, the first N.I.P. Volume I, pp.2) identifies weak R & D culture in public and private institutions as one of the major constraints to economic growth and development.

Objectives of the Study

The objectives of this study are:

1. To explore the concept of science and technology education and its impact on national economic development: This objective aims to define the role of science and technology education in driving economic growth, particularly in the context of Nigeria.
2. To analyze the relationship between a science and technology education-driven economy and Nigeria's economic strategies: This objective seeks to examine how a robust science and technology education system contributes to achieving broader economic goals, as outlined in Nigeria's Renewed Hope Agenda.
3. To evaluate the potential contributions of science and technology education research in addressing key sectors within the Renewed Hope Agenda: This involves identifying how research and innovation in science and technology education can directly influence areas such as infrastructure, agriculture, healthcare, and industry in line with the Renewed Hope Agenda.
4. To assess the current state of science and technology education in Nigeria and its alignment with the Federal Government's strategic goals: This objective investigates the existing gaps in the education system and how they hinder or promote the achievement of the Renewed Hope Agenda.
5. To propose policy recommendations for enhancing the integration of science and technology education research into Nigeria's economic development plans: This aims to offer concrete suggestions for policymakers on how to better integrate science and technology education in the national agenda for faster socio-economic development.
6. To identify challenges and opportunities for leveraging science and technology education to promote innovation and entrepreneurship in Nigeria: This objective addresses the barriers to and potential for fostering an innovation-driven economy through education.

Concept of Science and Technology Education

Science is a branch of knowledge that is concerned with the observation and classification of facts and formulation of general truth. Science suggests ideas and technology operationalizes them. Science clarifies and justifies how an objective may be achieved. The "how" is translated into practical realization and from here, technology takes over and complements science (Rosowsky, 2022). This therefore shows that there is a symbolic relationship between science and technology. Science which is a systematic search for truth provides the basis for technology. Without technology, science becomes impotent, and without science, technology does not exist. However, it is the technology, the application of techniques and not science that leads to increase in production. In the past, science and technology constituted distinct traditions, maintaining separate identity paths of process and activities. But around the 19th century, there was a development of closer relationship between the two. The narrowing of that gap of separate identities culminated in the birth of the concept of science and technology. Technology simply put is a means of harnessing and exploiting our understanding of nature for our own benefit. It is an application of knowledge for practical purpose. It is used to improve human condition, natural environment or to carry out other socio-economic activities. It could also be defined or refers to all processes dealing with materials and their end products. One important attribute of technology is that it does not just happen; it is developed and learned whether in the form of manual skills or as an applied science. It is the systematic application of collective human rationality to the solution of human problems through the assertion of control over nature;



Influence of Science and Technology Education Research- Driven ... Ankeli, G. O. (2026)

technology is the engine of growth. Technology can be traced historically to the beginning of time to be man's quest to improve his way and quality of life. According to Anaeto (2016), Technology is the total and complete application of man's knowledge, skills, tools and materials. It is the use of scientific knowledge to develop and produce goods and services useful to man. It is practical problem-solving enterprise, which is propelled by scientific discovery or by societal needs. Technology therefore, can be broadly classified into two major categories namely: (a) Material Technology- where knowledge is embedded into technological products such as tools, equipment, agro-chemicals, improved plant varieties or hybrids, improved breeds of animals and vaccines. (b) Knowledge-Based Technology- such as technical knowledge, management skills and other processes which are needed to successfully produce products or grow crops. A technology may be appropriate or inappropriate depending on the nature and capable of use of such technology. An appropriate technology is a form of technology which makes use of available resources in a given economic environment. It concentrates on tools and techniques which are carefully tailored to their needs, for a technology to be appropriate; it must show the following features: (i) Simple and easy to understand; (ii) Manageable; (iii) Inexpensive; (iv) Flexible; (v) Adaptable to changing needs; (vi) Technically feasible (vii) Locally serviceable; (viii) Employment generation potential; (ix) Infrastructural compatible and compatible with the people's cultural practices. Therefore, a technology well suited to one environment may not transfer well to another very different environment.

Impact of Science and Technology Education Research-Driven Economy

Science and technology have been central in the progress and development of virtually all the nations of the world. It has contributed immensely in all sector of the economy. Science and technology are intimately connected with development because; they have historical record of bringing advances that have led to healthier, longer, wealthier and more productive lives and they are key ingredients to solutions to the most serious poverty alleviation and economic development challenges that we currently face and are likely to face in the future. The many ways in which science and technology education research impact on the renewed hope agenda is discussed as follows:

1. Agriculture and Food Security

Advances in science and technology have facilitated higher yields, greater efficiency and greater nutritional content in the worlds food supply. Food production, however, must double in the coming decades to meet rising demand and meet the challenges entailed in inter-alia improving resistance to drought, pests, salinity and temperature extremes, raising the nutritional content and reducing post-harvest loss all in an environmentally and socially sustainable manner. At the same time, the regulatory challenges of assuring safety in food production and consumption will increase exponentially. Although, the necessary technology for increasing the agricultural output is available in many developing countries including Nigeria but certain requisites must be met. They according to Barnabas and Salami (2021) include: a) The will to advance economically; b) Opportunity and organization to use the technology. (c) Elimination of political, social and economic obstacles to development as was inherited from early colonial history. d) Ability first, to incorporate the technology into overall development, and then to continue using it. In the domain of food security, advances in science and technology provided the foundation for Green Revolution, and have allowed food prices to remain at historical lows for the past decades. Improved knowledge of plant biology and breeding techniques led to better seeds and cultivation practices that drastically increased yields. Rapid advances in the understanding of plant biology and related areas (especially via genomics) hold hope for solutions to problems as varied as increased productivity, nutritional content of food, food as a carrier of vaccines, soil/land degradation, post-harvest loss, and drought and pest resistance.



2. Power Sector

Access to affordable energy is essential for people currently living without electricity and is a pre-requisite for economic growth. Further advancement and application of research is needed to find new environmentally and socially sustainable technology that can meet the energy needs of developing countries (Bryan, 2021). Other problem, such as the needs of people who live without access to adequate fresh water, or whose health and livelihood are endangered by environmental degradation call for development of new technologies (along with appropriate policy frame works)to mitigate these problems and their effects on poor people. Timely local adoption often requires significant indigenous technological capacity. Modern clean, renewable energy technologies such as; solar, wind, modern biomass need to be developed further and there needs to be an increase in the efficiency and sustainability of energy use in transportation, industry, and housing.

3. Economic Growth and Rural Development

Science and technology are tragically important to economic opportunity and growth. For many years policymakers have suspected a close link between economic growth and productive investment in science and technology and now mounting evidence supports this, in three principle ways (Fathi *et al.*, 2020). First, since the industrial revolution, rich (developed) countries have had the most science and technology capacity and have grown fastest. From 1870 to the present, scientifically and technologically-advanced countries have become increasingly wealthy and their rates of growth have not diminished as this occurred. Second, returns to rural and development have been shown to be consistently positive and high in countries where science and technology are properly established. In such case, there is always a correlation between innovation and growth.

4. Water Supply

Water is another vital but scarce resources for which, in the absence of technological innovation, current and projected use patterns can only lead to severe crises. Today, about, 1.3 billion people lack access to an adequate supply of safe- water, two billion people do not have access to adequate sanitation, and water pollution causes millions of preventable deaths each year, especially among children. Water pollution is expected to continue to degrade freshwater and marine ecosystems, with a significant loss of biodiversity. The challenge is to leverage new technologies to provide an adequate supply of "safe" water in urban and rural areas to all users in a growing-wealthier population: households, agriculture and industrial sectors for instance; inexpensive desalination.

5. Healthcare Delivery, Sanitation and Environmental Management

Advances in scientific knowledge and its application have helped slow the trend of high fertility, high mortality and led to increasingly better health for many people world over. Nonetheless, vector and water borne diseases, Aids, inadequate pre-natal and maternal/child create a tremendous burden in the developing countries. Nigeria and indeed countries will be unable to correctly identify public health needs and choose cost-effective package of health service if they lack science and technology capacity. Ill-health is both a cause and a consequence of poverty. Over the past century, science and technology provided the basis for the largest ever aggregate improvements in human health. Certain scourge diseases have been eliminated, for example, smallpox, while the morbidity and mortality associated with everyday health related events like childbirth and routine infectious disease have declines sharply. Indoor air pollution, dysentery, water-borne disease, for instance, cholera, vector borne disease, for example malaria, dengue and so on. AIDS account for millions of deaths annually and are hitting hardest the countries that are least prepared and can least afford to deal with them.



Influence of Science and Technology Education Research- Driven ... Ankeli, G. O. (2026)

Some of these issues can be addressed using current knowledge, for example, dysentery while still others require scientific breakthroughs in science and technology such as AIDS, malaria and even Ebola. Environmental degradation at the local, regional and global scale adversely affects the livelihoods, health and vulnerability of poor people. Local issues include indoor and outdoor air pollution and water pollution, regional issues include acid deposition, and global issues include climate change, stratospheric ozone depletion, and loss of biological diversity, land degradation and desertification. These changes in the environment can adversely affect the incomes of poor people who depend on natural resources for their livelihood. These changes may also adversely affect human health through air and water pollution, an increase in the exposure to vector borne disease such as malaria and dengue, and an increase the vulnerability of poor people to extreme weather phenomena, such as floods and droughts and sea level rise due to climate changes. Hence, environment degradation threatens poverty alleviation and long-term sustainable development. The key challenge is to recognize that local, regional global environmental issues are inextricable linked and affect sustainable development. Therefore, there are synergetic opportunities to develop more effective response options to these environmental issues that enhance benefits, reduce cost and more sustainably meet human needs. The capacity of countries to adapt and mitigate can be enhanced when environmental policies are integrated with national development policies.

6. Social Investments and Poverty Alleviation

Science and technology have been central in the progress made to date in the fight against poverty and in stimulating economic growth. Advances in science and technology are, in many ways, the ultimate Global Public Good: once discovered, their benefits can be extended to additional users at little or no marginal costs, the social investment programme of the renewed hope agenda is completely driven by technology, right from the data gathering and capturing to the point of payment and utilization of beneficiaries personal information. In most basic and critical areas of human need, science and technology have made possible significant progress to date, and they hold the best prospects for continued progress, particularly with respect to agriculture, health, energy, water, and environmental concerns.

7. Education

No economy has ever becomes developed with this skew in their system of education and training for national manpower supply and/or human capital development. The utter disregard for science and technology education as an instrument of development has caused incalculable damage to our corporate existence. The problems of mismanaged economy, mass unemployment, collapse of health and educational services, insecurity, inflation, collapsed infrastructure and so on can all be traced to the inadequate attention paid to science and technology in Nigeria. It is the lack of science and technology initiative by Nigerians that has led people to turn their energy to the lust for power, greed and self destruction. Sadly enough, every Nigerian finds every other person guilty as charged, except himself or herself. Government's policy on education has among other issues emphasized but not driven the following objectives:

- a) The training of the mind and the acquisition of appropriate skills, abilities and competencies-both mental and physical as equipment for the individual to live and contribute to the development of the society.
- b) Ensuring that all schools are properly equipped to promote sound and effective teaching, and in particular, that suitable textbooks and libraries are provided for school. Secondary education should be six-year duration and be given in two stages, a junior secondary school stage and a senior secondary school stage. The junior secondary school (3-year duration) will be both



Influence of Science and Technology Education Research- Driven ... Ankeli, G. O. (2026)

prevocational and academic. It would be free. The senior secondary school would be for those *able* and willing to have a complete six-year secondary education (Chien, 2023).

A greater proportion of education expenditure would be devoted to science and technology and a greater attention paid to the development of scientific orientation. However, it is common knowledge that three decades after these objectives were set out to improve the standard of education in the country, not only have none of the objectives been realized, but also the standard of education has fallen far below what it was before (Kings, 2019).

8. Societal and National Development

Science and technology hold the key to the present and future development of Nigeria or any other country for that matter. Technology plays a fundamental role in wealth creation, improvement of the quality of life and real economic growth and transformation in any society. The sooner Nigeria realizes that her escape from poverty is predicated on her investment in science and technology education, the better for her. There is a technological power vacuum in Nigeria waiting to be filled by which ever geo-political zone that cares to mobilize its people through dedicated and selfless services. Essentially, technology is the primary engine of economic growth (Manoar, 2020). It is the key and fundamental requirement for value addition to raw materials and people. It provides the key to unlocking any country's potential in terms of decreasing over-head costs associated with out sourcing and creating employment opportunities. Science and technology education will not only prepare the Youths of Nigeria and indeed any other nation, for fulfilling career prospects, but also train their minds to address social problems with scientific mind. Youths equipped with science and technology education are also endowed with high employment opportunities. Many developed and advanced countries did progress much because of their heavy investments on science and technology. Examples: The United Kingdom and France benefited immensely from the industrial revolution in the 19th century.

Similarly, the United States emerged from an agrarian economy in the 19th century into an industrial superpower in the 20th century. More recently, Taiwan and Korea have exploited advances in silicon microelectronics from the early 1960s. China and India have emerged as industrial leaders in manufacturing and information technology respectively. Malaysia has also followed in the footsteps of these later Asian successes. It is necessary to emphasize here that in recorded achievements all these countries invested heavily in people, factories and infrastructure that provided the foundation for today's industries. These successes were all based on carefully designed roadmaps of plans and strategies. Unfortunately, however in many if not all the non-development or yet to develop countries, technology is seen or viewed as a consumable- item, and not something that can be produced or created. Analysis of technologically advanced economics shows that at each level of the economy, science and technology provide the engine for economic growth. For example, in the case of primary products, application of science and technology significantly increase the yield from agricultural production and mineral beneficiation. Similarly, new and existing industries do stimulate economic growth at the intermediate level, while the overall volume of activity at the tertiary level is amplified by increased use of science and technology associated with information technology and improved distribution/marketing networks. Therefore, the need for countries with the intention to grow, to invest significantly in science and technology cannot be overemphasized. This is achieved by developing the talent, the human capacity required to compete in a globally competitive world of today.

Conclusion



Influence of Science and Technology Education Research- Driven ... Ankeli, G. O. (2026)

Technology is achieved through a combination of knowledge, methods, tools and skills. This four-element definition of technology offers the details and clarity required for technology enhancement planning that must necessarily include knowledge and skills upgrade (training) and acquisition of human elements (knowledge and skills) and the tangible elements (methods and tools) of technology form the basis for our thinking and working processes. We must ensure adequate development of man power in science and technology to guarantee the efficient utilization of abundant natural resources and reduce the drain on our treasury and independence on outside sources for industrialization. The nation should be technologically self-reliant in the production of capital and consumer goods and raw materials. The educational system shall emphasize science at all levels and re-orient the entire society towards scientific thinking in order to develop new technologies and adapt existing ones to improve societal well being and security. Technology based developments can occur only with concerted efforts to revitalize education, develop personnel and create integrated industries that will involve close collaboration between government, industry and academia. Considering the roles of science and technology in national development, it become important to stimulate demand for technology from private sector, renew emphasis on the creation of linkages between firms and knowledge institutions, reform enabling environments for better use of knowledge, setting priority and evaluation right, promoting transparency, objectivity, selectivity and international best practices in science and technology funding, increasing access to Information and Communication Technologies (ICTs) and Government as a consumer of knowledge.

Recommendations

Based on the findings the following recommendations were provided:

1. Policies for science and technology in human resources development aim to provide science education at the basic secondary and tertiary level, prepare young people enter a diverse labour force that requires various levels of science and technology sophistication and encourage the conduct of research and advanced training.
2. "Implicit" policies for science and technology create an enabling environment that stimulates demand for knowledge in the private sector through, inter alia, a stable macroeconomic environment.
3. Appropriate climate for trade and investment, credit policies and adequate intellectual property rights regime. "Explicit" policies for science and technology in the private sector aim to further break down barriers to the use of knowledge. These policies may include support for firm-based training to encourage technology deepening, increase industry-academia linkage and public private partnerships, establish protection for indigenous knowledge provide tax incentives for firm engaged in rural development, and stimulate "clusters" of knowledge based industries.
4. Policies for public support of science and technology must address the various aspect of the public role in the national innovation system, including: setting priorities for funding and research, providing financing, instituting open, transparent peer-review selection processes establishing governance regulatory and management mechanism, incorporating the results of research in public policy decision, and monitoring and evaluating the system.
5. Policies for information and communication technology should seek to maximize the access to and flow of knowledge by, inter alia, extending access of available ICT to a wider range of user, improving the regulatory framework to facilitate a conducive environment for ICT growth, and providing training and education to facilities broader use of ICT.

References



www.foefugusau.com.ng

des@fugusau.edu.ng

DOI: <https://doi.org/10.64348/zije.2026426>

Influence of Science and Technology Education Research- Driven ... Ankeli, G. O. (2026)

- Alhassan, N.U. and Abdullahi, T. (2013). Revitalizing technical, vocational and education training (TVET) for youth empowerment and sustainable development. *Journal of Educational and Social Research*, 3(3), 143-154
- Anaeto, F. C., Et al (2016). *The Roles of Science and Technology in National Development*. DRJSSSES, 3 (3); 38-43. directresearchpublisher.org/journal/drjssses/
- Barnabas, E. S., and Salami, F.O. (2021). The impact of technology on the fight against crime among youth in Plateau state, Nigeria. *International Journal of Research in Science, Technology and Mathematics Education (IJRSTME)*, 7 (1), p. 62-69.
- Bryan, C. (2021). Modern technology in the construction industry. Retrieved on 11th February 2024 from www.pbctoday.co.uk
- Chien, Y. (2023). The integration of technology in the 21st century classrooms: Teacher attitudes and pedagogical belief towards emerging technologies. *Journal of Technology Integration in Classrooms*, 5(6), p. 6-11.
- Echono, S.T (2023). Education, research and human development in Nigeria: The challenges and missing link. Paper presented at the 18th convocation ceremony of Enugu state university of science and technology, Enugu, Enugu state.
- Fathi, C., Sheda, A. and Nahid, W. (2020). *Education and technology revolution, ending the cycle of failure, teaching and technology group*. Retrieved 20th Febraury 2024 from <http://www.tctgroup.org/resources>
- Kings, P. (2019). *ICT for Education: Potentials and potency*. Retrieved 10th February 2024 from <http://www.edu/ct/org/techno/1632>
- Monaor, M. (2020). *Ways technology has improved wood working*. Retrieved on 22nd February 2024 from www.naijatechguide.com
- Nwakaire, O.N and Nnorom, C. (2015). *The Imperatives of Institutional Research and Development in Sustaining and Improving the Quality of NonFormal Education Programmes in Southeast Nigeria*. IISTE: E Journal. 5 (19), 82-86. www.iiste.org
- Rosowsky D. (2022). The Role of Research at Universities: Why it Matters. Education. Forbes. www.forbes.com