Harnessing Home-Grown Technology for National Development: A Review

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ABSTRACT: This paper aims to examine the potential of homegrown technology in promoting national development in developing countries. The paper argues that while technology produced in the developed world has brought certain benefits to developing countries, harnessing homegrown technology for national development in developing countries can bring more lasting and meaningful benefits. Specifically, the paper makes a case for using homegrown technology to facilitate economic development, strengthen local governance, and provide access to healthcare and education. The paper begins by discussing current trends in technology diffusion in developing countries. It then goes on to provide an overview of the advantages of domestic technology for national development. Next, the paper outlines some of the challenges associated with using homegrown technology. Finally, the paper concludes with a review of recent initiatives that have been successful in harnessing homegrown technology for national development. the paper highlights that homegrown technology can be an effective tool for promoting national development. It argues that national governments should encourage local technological development and use homegrown technology to facilitate economic growth, strengthen local governance, and provide access to healthcare and education. Further research is needed to assess the impact of homegrown technology and devise strategies for maximizing its potential to drive national development in developing countries.

KEYWORDS: Harness, Home-Grown, Technology, Development, Link, Value-base.

INTRODUCTION

Traditional education has been with us before the advent of the whites (Fafunwa, 1974). The basic concept of traditional education then was functionalism. It is on record that people have been living on water, making and invocating farming and hunting implements for their survival and the society at large. (Anyanwu, 2014; Fafunwa, 1974) asserted that unemployment, if it existed at all, was very minimal, and very few young men roamed the villages and towns. This casts doubt on theory X, as put forward by (Toby, 1997) that an average human being dislikes work, and will avoid it if he can, or is described as lacking in ambition and will like to be coerced, controlled, directed, threatened with punishment to get him to put forth adequate effort towards the achievement of organizational objectives.

It is of note that traditional African education is predicated people on theory 'Y' which assumes that people do not hate work, that people do not have to be forced or threatened; that motivation, potential for development, capacity for assuming responsibility, and readiness to direct behaviour towards organizational goals are all present in the people. Thus, according to McGregor (1960) the responsibility of management (Government) is to create a climate in which people organize and develop these human characteristics for themselves since people will only commit themselves to an organization to the extent that they can see ways to satisfying their own ego and development needs

(Mctier, Macdougall, & Mcgregor, 2016; Okolie et al., 2020)Technopreneurship is part of entrepreneurship that focuses on technological factors which represents the combination of science and technology in its commercial operations. The development of technology business is largely a result of the synergy between creative thinkers, who belong to different research centers (like universities), with capital providers for their business. Professional technology has two main processes: ensuring that technology works according to customer needs and that technology can make a profit. Technology leaders are people who can create and innovate a product that will be sold in general to the market. There are two factors motivating companies to form technology leaders which are: business lifestyle and high-growth businesses. Commercial business styles do not grow in general and quickly, so they are less attractive to professional investors. On the other hand, high-growth companies have the potential to generate huge wealth quickly, but they face a market risk, offering large and attractive rewards for venture capital. Dell is an example of a company with a high-growth business. The development of various innovation centers and business incubators in technology in many universities and research institutions is a positive effort to build artwork, as in Indonesia (Saripudin, Juanda, Abdullah, & Ana, 2020).

Science and technology in a business is everyday operations. The growth of technology has led to the expansion of

business. For example, receive funding from investors and donors to conduct studies and investigations. These centers use this money to gather data and information, as well as hire researchers and purchase necessary equipment for their research projects. These funding sources play a crucial role in supporting the work of research centers, helping them advance knowledge and make important discoveries. Professional technology consists of two main processes. Making sure that technology is used in a way that meets the requirements and desires of the customer these technologies have made our lives easier and more convenient. They have improved many aspects of our daily activities, such as communication, transportation, and entertainment. People can now connect with others easily through the internet and social media, making the world a smaller and more connected place (Abbas, 2018)(Cardoso, Jos´e Lu´ıs, Esc´aria, V´ıto, Ferreira, V´ıtor S´ergio, Madruga, Paulo, Raimundo, Alexandra, and Varanda, 2014). Transportation has become faster and more efficient with the invention of cars, trains, and airplanes, allowing people to travel long distances in a short time due to the advances in technology made possible by the exploits of man through research and interaction with the environment. Lastly, the availability of various forms of entertainment, such as movies, music, and video games, has increased, providing people with more options to relax and enjoy their free time. In conclusion, the development of different technologies has greatly impacted and improved society by enhancing communication, transportation, and entertainment.

THE MISSING LINKS

There is no doubt that our technology drive today is not foundational. This accounts for the drift forward and backward. One cannot build something on anything. We have heard words like, stealing of technology, imitation, and so on from our leaders; all these have not yielded any meaningful impact. Technology should be value-based, taking into account the socio-cultural and economic values of the society it intends to serve. Nigeria is currently at its lowest ebb in human capital development and utilization because of its inadequate education system (Hidayat, Herawati, Syahmaidi, Hidayati, & Ardi, 2018; J Priyadharshini & M Selladurai, 2016; Okorie, 2014; Rufus, Tunde, Emmanuel, & Mohd, 2019; Yasin, 2017). Technical and Vocational Education tends to produce skilled men for employment and remain vibrant (Baert, 2005; Nishad, 2013; Onyeike & Onyeagbako, 2018) A recourse to the valued orientation of the African traditional education where skill acquisition is the order of the day is desirable but, with innovations and improvement that come with packaging of trainees in a modern and organized environment. This encompasses, planning and financing so that a Home-grown technology based could evolve and radiate.

The physical and socioeconomic development of a nation depends on its technological development. Technological development has a direct relationship with the standard of living. This again has a direct bearing on the leadership vision for developing local technology institutional framework, enabling policy, and funding capacity building. The need for modern technology arises from the population explosion leading to an increase in demand for goods and services, pressure on land for Housing and Agriculture, better service delivery, time management, cultural evolution, and globalization. The specific areas of need include infrastructural development, Housing, Transportation, Education, Agriculture, Health, Manufacturing, Tourism, Surveying and Town Planning among others.

Challenges to modern technology in Nigeria

The challenges to modern technological development in Nigeria ranges from poor infrastructural database, political instability, poor budgeting allocation to educational institution for research, Bureaucratic control, unsustainable government policy, insecurity in the land, and weak/inadequate research studies (Elijah, 2017; Emmanuel, 2015; John Olutope, 2014; Jonathan C., 2018). All these serve as impediments to metamorphosing our local technology to meet international standards.

These problems can be met by purposely visualizing activities and programmes that are practically determined to flush out the debacle. The thing that prevent innovation are due to lack of knowledge. There are many different technologies, knowledge sources, and markets available. In the past, research has shown that there are barriers to innovation because of limited knowledge about technologies and markets, difficulty getting money to fund new ideas, and a lack of skilled workers. The findings of the study showed that companies that are not part of a big business group or small and medium-sized enterprises (SMEs) are more likely to face difficulties in gaining knowledge. The main reason for this problem is that a big organization or group has the advantage of being big, so they can spend more money on activities like finding knowledge or managing measures. This leads to a bigger impact on their business performance. Technopreneurships have a downside where they usually lack enough funds to systematically explore information about technologies and markets.

Bridging the Missing Links

This attempts to proffer solutions to the problem of our technological backwardness through an array of postulated programmes. b

Financing Innovation and Technology

This is one of the major measures that can be provided by the Government for enhancing innovation and technological development. This can be operated by different Ministries or Departments of Government, Financial institutions, and

others. These are intended for all categories of units ----large, small, and medium and even individuals and in various sectors. It is for a unit to choose which one suits it the best. The Tertiary Education Trust Fund is EXACTING itself in our Universities, Polytechnics, and Colleges of Education. A few important ones are mentioned below:

(a) Technology Development Board (TDB): The Board will administer

funds for Technology Development and Application. It is to provide equity capital, loans on soft terms, and other financial assistance to innovative research and development projects. The assistance is available to manufacturing units in public and private sectors including academic institutions.

(b) Science and Engineering Research Council (SERC)
This provides financial support to basic research across various disciplines. The focus is to promote basic and applied research in frontline areas of engineering and technology. Under this scheme, various academic and research institutes work in collaboration with industry.

(c) Instrumentation Development Programme (IDP)
Under this program, funds are provided for innovative designs and projects. The projects for support are received from academic, and Research and Development Laboratories.

(d) Technology Development and Promotion Programme
This is aimed at catalyzing and supporting activities relating to technology absorption, adaptation, and demonstration including capital goods development by involving industry and research organizations. The specific objective of the programme is (i) supporting industry for technology development, demonstration, and absorption of imported technologies (ii) building indigenous capabilities for the development and commercialization of contemporary products and processes of, high impact (iii) involvement of national research organization in joint projects with industry (iv) technology evaluation in selected sectors.

(e) Technopreneur Promotion Programme (Tepp)
This is a novel programme aimed at topping the vast innovation potential of the citizens. It is a mechanism to promote individual innovators, assist them in becoming technology-based entrepreneurs, and help them in networking and forgoing linkages with other constituents of the developments. The government will determine the amount of money in the form of a grant to be offered but not less than a million Naira to cover expenditure on research and development, procurement of small tools, raw materials, fabrication, and packaging.
Entrepreneurs who are focused on incorporating technological innovations into their business ventures have a higher propensity to success. These individuals combine their knowledge of technology with their entrepreneurial skills to create successful companies that leverage the power of technology. Technopreneurs identify opportunities where technology can be used to solve existing problems or create new products and services. They bring together technical expertise, creativity, and business acumen to turn these ideas into viable business ventures. Technopreneurship holds great potential for driving innovation, economic growth, and job creation in today's digital world.

(f) Homegrown Technology (HGT)
The Technology Information, Forecasting & Assessment Council (TIFAC) operates this scheme in India. Its objective is to promote the commercialization of homegrown technologies and to assist in their scaling up from a pilot scale to full production. The scheme provides partial financial assistance and techno-managerial inputs through project monitoring committees (Bhardwaj, 2021). There is active participation of industries and academics. The results indicate that making improvements to the design of a product based on what customers want can help create products that last a long time. The research showed that in a company's knowledge management portal, there is information about how customers behave and what they like. This information can be used to create new products. Knowledge management helped to make the manufacturing process more flexible and saved money by using agility principles, according to the study. Simple words: Using reactive scaling techniques like top-down and bottom-up, along with flexible APIs (Application Programming Interface), made it possible to automate infrastructure organization and resource allocation effectively. The use of vendors' knowledge helped create products that were ready for the market and helped them last for a long time.

CONCLUSION AND RECOMMENDATIONS
America is ruling the whole world today not because of her size but because of her potential and feats in the field of technology. Nigeria too can be a true giant of Africa if we put all our arsenals together, shun corruption, re-dedicate ourselves to national rebirth through a new direction, directed towards building a technologically inclined nation, and draw inspiration from the experiences of the African traditional societies. Nigerians particularly, youths are strong, energetic, focused, ambitious, and ready to work. Government, Philanthropists, and Traditional rulers have important roles to play in the identification of potential skill-ladder individuals for organization into groups in the overall national interest. Government is advised to set up an Agency saddled with the responsibility of identifying those with special practical and innovative skills to organize them in a special environment for further training. The modality should be organizing those with special skills into the same environment for cross-fertilization of ideas among groups and members. This should be replicated among the backing for research activities. There should be a government policy postulating a strong linkage

between academia and the industry for research implementation and advances.

REFERENCES

1. Abbas, A. A. (2018). The Bright Future of Technopreneurship. *International Journal of Scientific & Engineering Research*, *9*(December), 563–566.

2. Anyanwu, J. C. (2014). Does Intra-African trade reduce youth unemployment in Africa? *African Development Review*, *26*(2), 286–309. https://doi.org/10.1111/1467-8268.12082

3. Baert, H. (2005). Lifelong learning and employability: The role of the Flemish government. *Lifelong Learning in Europe*, *10*(2), 82–87. https://doi.org/10.1371/journal.pone.0143408

4. Bhardwaj, B. R. (2021). Adoption, diffusion and consumer behavior in technopreneurship. *International Journal of Emerging Markets*, *16*(2), 179–220. https://doi.org/10.1108/IJOEM-11-2018-0577

5. Cardoso, Jos´e Lu´ıs, Esc´aria, V´ıto, Ferreira, V´ıtor S´ergio, Madruga, Paulo, Raimundo, Alexandra, and Varanda, M. (2014). Employability and Higher Education. *Journal of Graduate Employability*, (0), 17–31.

6. Elijah, O. (2017). Technopreneurship: A View of Technology, *17*(7).

7. Emmanuel, S. (2015). Repositioning technical and vocational education toward eradicating unemployment in Nigeria, *7*(6), 54–63. https://doi.org/10.5897/IJVTE2013.0142

8. Fafunwa, B. (1974). *History of Education in Nigeria*. london,UK.: George Allen and Unwin.

9. Hidayat, H., Herawati, S., Syahmaidi, E., Hidayati, A., & Ardi, Z. (2018). Designing of technopreneurship scientific learning framework in vocational-based higher education in Indonesia. *International Journal of Engineering and Technology(UAE)*, *7*(4), 123–127. https://doi.org/10.14419/ijet.v7i4.9.20632

10. J Priyadharshini, & M Selladurai. (2016). Technopreneurial Education and Its Impact in India. *Asian Journal of Multidimensional Research*.

11. John Olutope, E. (2014). Infrastructural Facilities and the Practice of Vocational Business Education in Nigeria. *IOSR Journal of Humanities and Social Science*, *19*(5), 01–05. https://doi.org/10.9790/0837-19550105

12. Jonathan C., N. (2018). Entrepreneurship Education and the Challenges of Graduate Employability in Nigeria. *International Journal of Innovation, Management and Technology*, (October), 189–193. https://doi.org/10.18178/ijimt.2018.9.5.812

13. Mctier, A., Macdougall, L., & Mcgregor, A. (2016). Mapping the Employability Landscape for People with Learning Disabilities in Scotland Mapping the Employability Landscape for People with Learning Disabilities in Scotland, (August). Retrieved from https://onlinelibrary.wiley.com/doi/full/10.1002/berj.3171

14. Nishad, N. M. (2013). Role of Employability Skills in Management Education : a Review. *ZENITH International Journal of Business Economics & Management Research*, *3*(8), 34–45.

15. Okolie, U. C., Nwajiuba, C. A., Binuomote, M. O., Osuji, C. U., Onajite, G. O., & Igwe, P. A. (2020). How careers advice and guidance can facilitate career development in technical, vocational education, and training graduates: The case in Nigeria. *Australian Journal of Career Development*, *29*(2), 97–106. https://doi.org/10.1177/1038416220916814

16. Okorie, N. N. (2014). Technopreneur: An Urgent Need in the Material World for Sustainability in Nigeria. *European Scientific Journal*, *7*(3).

17. Onyeike, V. C., & Onyeagbako, S. O. (2018). Enhancing employability through university education: the role of National University Commission (NUC). *Global Journal of Educational Research*, *13*(2), 109. https://doi.org/10.4314/gjedr.v13i2.7

18. Rufus, S., Tunde, A., Emmanuel, A. O., & Mohd, N. B. (2019). Failure Factors Quality in Vocational and Technical Education in Nigeria Higher Institutions : A Rasch Analysis Approach, (X), 1–8. https://doi.org/10.35940/ijrte.xxxxx.xxxxxx

19. Saripudin, S., Juanda, E. A., Abdullah, A. G., & Ana, A. (2020). Integration of ICT Skill Among Vocational School Teachers: A case in West Java, Indonesia. *International Journal of Innovative Technology and Exploring Engineering*, *9*(5), 251–260. https://doi.org/10.35940/ijitee.b7281.039520

20. Toby, T. U. (1997). *Essentials of Management and Leadership in Vocational and Technical Education*. Agbor, Nigeria: Centre Books Limited.

21. Yasin, M. (2017). Increasing Technopreneurs for a Developing Nation : The Majlis Amanah Rakyat (Mara) Experience. *Journal of Technical Education and Training*, *9*(1), 73–86.