



## **FROM THEORY TO ACTION: PROMOTING ENTREPRENEURSHIP SCIENCE INTO BUSINESS, RESEARCH AND COMMERCIALIZATION**

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### **ABSTRACT**

The importance of science and entrepreneurship to any nation cannot be overemphasized as science has direct bearing on almost every level of humanity while entrepreneurship ensures the creation of jobs, wealth, products and services. Through research, discoveries are made that can be converted into products or services. However, without commercialization, ideas emanating from entrepreneurs, scientists, researchers and academicians amongst others, will not be utilized or converted to products or services. Research commercialization which entails converting ideas to reality is therefore, of paramount importance to every nation that is interested in harnessing its human resources for natural development. Research and Development (R&D) therefore, only have value when they serve a purpose and are useful only when they get to a market. This paper aims at exposing the role of academicians in higher institutions as researchers who also have a role to play in R & D (by researching and writing papers) and commercialization of R & D (advocating for the recommendations of the written paper to be implemented). Using the qualitative method and a partial quantitative method, the findings of the paper reveal that though Nigeria has many research institutes and tertiary institutions set up by both the government and private bodies, researches carried out are hardly commercialized thereby defeating the essence of the research in the first place. This paper therefore recommends that, Academicians be made aware of what true research and commercialisation entails, its impact on the economy and their roles as not just lecturers but also researchers. Managements of tertiary institutions should therefore give proper orientation to both new and old staff on their roles as researchers in higher education. This is to ensure that useful research papers are written. Furthermore, appropriate bodies (e.g., Management, Academic Staff Unions, and



Individual Researchers) should through their papers or activities, advocate for commercialisation of research ideas. The Tertiary Education Trust Fund (TET fund) can extend its funds to commercialisation of researches of those in higher education and a new body similar to TET-Fund can also be commissioned and saddled with the responsibility of commercialisation of research ideas of researchers in higher education.

**Keywords:** Science, Entrepreneurship and Research commercialization.

## 1. INTRODUCTION

Sixty-one (61) years after independence, Nigeria, a nation well-endowed with vast resources still battles with unemployment and poverty. According to a November, 2018 report by the National Bureau of Statistics, Nigeria's unemployment numbers jumped by nearly thirty (30) percent by sixteen (16) million in 2018 and is expected to still increase by another two million by the end of 2018. In more specific terms, unemployment rate in Nigeria increased from 22.70% in the second quarter of 2018 to 23.10% in the third quarter of 2018. "Unemployment rate in Nigeria averaged 12.31% from 2006 until 2018, reaching an all-time high of 23:10 percent in the third quarter of 2018 and a record low of 5.10% in the fourth quarter of 2010 (Trading Economics, 2019). In 2021, the unemployment rate in Nigeria is estimated to reach 32.5 percent. This figure is projected to increase further in 2022 (Varrella, 2021). Worthy of the note is the fact that unemployment is a full recipe for hardship and poverty.

The Voice of America (2018) news states that according to the Washington-based Brookings Institution, Nigeria overtook India in 2018 as having the largest number of people living in extreme poverty (87 million). It is important to state here that for wealth creation and national development to take place, Research and Development (R & D) activities must be effectively managed. This is crucial to every economy as failure will lead to unemployment and hence-poverty.

Ukwuoma, Amade and Moghalu (2013) state that, in most countries, the quality and quantity of R & D results are recognized as pivotal in reenergizing national development and economic wellbeing. Abutu (2018) of All Africa news quotes Dr. Christopher Ogbonnaya Onu, the Minister of Science and Technology for Nigeria saying "low quality of R & D results and inventions emanating from universities and research institutes, coupled with insufficient management of intellectual property



assets have been defined as (the) bane of low commercialization of research results in Nigeria.” This statement does not even include other institutions of higher learning such as Polytechnics, Monotechnics and Colleges of Education amongst others.

In same news, some Nigerian Scientists held a different view as they stated that what is required is adequate funding of research by the government and the private sector, which is lacking in the country; scientists in the country have been clamouring for the allocation of at least one percent of the country's gross domestic product to R and D. This scenario seems to imply that stakeholders involved in the matter seem to be pointing fingers at each other.

Dr. Dan Ibrahim, chairman of the committee on the blueprint for commercialization of R & D while presenting a report to the Federal Ministry of Science and Technology (FMST), in July, 2017, said that the Nigerian Technological base was very weak as the nation imports and consumes foreign technologies in virtually all sectors of the economy at the detriment of indigenous technologies. He affirmed that:

Nigerian researchers and inventors were very intelligent and creative... however, converting R & D results and inventions into products and services had been the greatest challenge.... many of the R & D results and inventions are lying idle on the shelves of the research institutions across the country without being commercialized.

He concludes by stating that government can only achieve its primary objective of diversification of the economy through commercialization of R & D results lying idle on the shelves of the research institutions across the country (Communication Week, 2017).

This paper aims at exposing to readers, the role of those in higher institutions as researchers who also have a role to play in R & D and commercialization of R & D (advocating for the recommendations of the written paper to be implemented). It is also hoped that the paper will enlighten readers who may not be in the field of entrepreneurship or science and hence may find the issues at stake abstract. In other words, it is hoped that at by the end of the paper, readers will be more enlightened regarding entrepreneurship, science and research commercialization and will be better informed.



## **2. CONCEPTUAL REVIEW**

### **Concept of Entrepreneurship**

Entrepreneurship refers to the act of setting up a business or businesses and taking financial risk in the hope of making profit at the end of the day. Hence, the Merriam-Webster dictionary (2015) refers to the entrepreneur as a person who starts a business and is willing to risk loss in order to make money. Ferreira, (2020) defines entrepreneurship as the act of creating a business or businesses while building and scaling it to generate a profit. In the same vein, Martins (2019) states that entrepreneurship is about transforming the world by solving problems, initiating social change, creating an innovative product or presenting a new life-changing product. She opines that entrepreneur see possibility and solutions where the average person sees problems. The meaning of an entrepreneur therefore involves someone who takes action to make a change in the world.

The importance of entrepreneurship to any society can therefore, not be overemphasized. This is because an entrepreneur identifies a problem in the world and focuses on creating the solution by creating jobs, products or services. Some of the functions of the entrepreneur or entrepreneurship therefore, include amongst others: Creation of jobs to curb unemployment, creating positive change in the society by producing new products and services, giving to the society by paying taxes to the government or by donating to poorer communities and adding to national income by generating wealth in the economy through their business ventures. In Nigeria unemployment is a common phenomenon, one of the major importance of entrepreneurship to the Nigerian society and her citizenry is that, it creates job opportunities; especially for those without white collar jobs.

### **Concept of Science**

Science can be defined as a branch of knowledge which deals with a body of facts or truths systematically arranged to expose the operation of general laws through observation and experimentation in order to make discoveries and create products or services. The belief that the earliest roots of science can be traced to the ancient Egypt and Mesopotamia is an indication that science is almost as old as humanity as humans always have a desire to understand the world around them. The science council.org (2021) defines science as the pursuit of, and application of knowledge and understanding of the natural and social world following a systematic methodology based on evidence. Scientific methodology therefore, includes the as benchmarks: evidence, experiment and observation.



The importance of science to any nation cannot be overemphasized as science has direct bearing on almost every level of humanity; from personal issues to global issues, science influences issues like food, energy, medicine, transportation etc. Jain (2018) writing on the importance of science states that, science is creating wonders everyday by making sheer fantasies become reality. Almost all that eases the daily life of humanity are the wonders of modern-day science. Examples are: Computer, Medical Science, Radio, Television, Travelling, Newspaper, Comfort (e.g. fans, air conditioners, and room heaters), Mobile phones, Power and electricity and Preservation (e.g. refrigerators, morgues)

It is almost difficult for one to imagine a world without the above examples and all these things became reality through research and commercialization. In other words, if the researchers who had the ideas never had their ideas transformed to reality (commercialization), such things would have remained in theory only. Without any action taken, there will be no product. The importance of science so glaringly obvious, it is disturbing to see that Nigeria is yet to give science its proper place in the scheme of things. Popova (2012) cites Sagan (1994) thus: we live in a society absolutely dependent on science and technology and yet have clearly arranged things in such a way that almost no one understands science and technology. That's a clear prescription of disaster.

This paper at this juncture also borrows the words of Sagan and puts it that we in higher institutions live in a society absolutely dependent on R & D but have arranged things in such a way that majority in higher institutions of learning do not understand what research is all about. The lecturer and student think it is an ordeal they have to go through. The lecturer must write a paper in order to be promoted and the student must write a project in order to graduate. This results in low quality of research and therefore, little or nothing to commercialize.

### **Research Commercialization**

Commercialization in general refers to introducing a new product or service into a market. Bloomenthal (2019) defines commercialization as the process of bringing new products or services to the market. He further states that, the broader act of commercialization entails production, distribution, marketing, sales, customer support and other key functions that are critical to achieving the commercial success of the new product or service.



Defining research commercialization, Gammon (2017) opines that research commercialization refers to the process through which ideas or research are transformed into marketable products, capital gains, income from licenses and for revenue from sale of a new product. This implies that come without research and commercialization, ideas emanating from entrepreneurs, scientist, researchers and academicians amongst others, will not be utilized. Research commercialization is therefore of paramount importance to every nation that is interested in harnessing its human resources for natural development.

## **DISCUSSION**

Effective management of R & D activities is crucial for wealth creation and natural development. Unfortunately, in Nigeria, utilizing research findings are not done as theory of researches are shelved in archival records. This is disturbing, considering the fact that the research and development only have more value when they serve a purpose and are only useful when they get to a market. In this sense, R & D result is purely an intellectual artifact and shall so remain and be of no service to mankind until it is commercialized (Ukwuoma et al, 2013).

Going by the above quote, it can be said that Nigeria is generally endowed with “intellectual artifacts” as the nation has a good number of research institutes and schools of higher learning nationwide.

### **Research Institutes in Nigeria**

In 1993, the Federal Government established its first multidisciplinary research and development center, Sheda Science and Technology Complex. The Common Wealth Network Nigeria (2019) lists about thirty-eight (38) research institutes in Nigeria. The Nigeria Bio scientist (2011) lists sixteen (16) bio scientific related research institutes. Yet, Ibiagbani (2019) reports in Sahara reporters that even though the number of the bio science related institutes have risen to forty (40) not much has been done in such institutes. Olufolaji (2018) lists fifteen (15) Nigerian agricultural research institutes spread across the country. The University of Nigeria, Nsukka runs a non-profit entrepreneurship research centre, Centre for Entrepreneurship and Development Research (CEDR). These examples illustrate that lack of research institutes is not a problem to Nigeria however; utilizing the ideas stored in them is the problem (University of Nigeria, 2019). Mfonobong (2020) lists seventy-one (71) research institutes in Nigeria and notes that they are largely the significant ones, meaning there are more.



### **Role of Schools of Higher Learning in Research Development**

Apart from lecturing and graduating students, another role that academicians often forget is the fact that they are the custodians of knowledge and it is their duty to always add to the body of knowledge through research. In other words, lecturers in higher institutions are expected to engage in research.

This is dominantly the reason why, part of the criteria for promotion of academic staff in higher institutions is the writing of research papers. Such papers if well researched and written contain ideas or solutions to Nigeria's problems; research means progress. Mohammed, Muzong and Mamza (2018) state that research should aim at bringing something new to the world of knowledge. Yet observations indicate that many lecturers are employed and are not aware that their jobs go beyond lecturing students. In fact, when they are told to write papers before they are promoted, they seem not to know why they have been asked to write and end up writing with no focus, vision or passion. They write simply because they want to be promoted. In fact, if given a choice, they would rather not write at all. The same aloofness and ignorance is passed on to the students and their terminal projects are an ordeal; most often than not, they copy already written and submitted projects and submit as theirs.

Bolaji (2019) lists universities approved by the Nigerian University Commission (NUC): forty-three (43) federal universities, fifty-two (52) state universities and seventy-nine (79) private universities giving a total of one hundred and seventy (170) universities.

The National Board on Technical Education Board (2019) lists the following as higher institutions under its purview: Polytechnics, Colleges of Agriculture, Monotechnic, Colleges of Health Education and Technical Colleges. It also amongst other lists, lists about twenty-eight (28) federal polytechnics, fifty-seven (57) private polytechnics and forty-eight (48) state polytechnics. This is to mention but a few as other lists e.g., Colleges of Education are not mentioned here. The examples given illustrate the fact that Nigeria is not lacking in human resources required for research because all Higher Institutions have academicians who are expected to research and forge national progress. The question is: are these stakeholders fully aware the onus on them as the custodians of knowledge and progress?





## **CONCLUSION**

The discourse so far indicates some facts about Nigeria regarding entrepreneurship, science and research commercialisation. Nigeria as a nation has many research institutes. As early as 1975, the Federal Government began establishing research institutes. One of the first is the National Cereals Research Institute, Badeggi which though established by an agricultural research order of 1975, has a long history dating back to 1898 (National Cereals Research Institute Badeggi, 2019). Other examples of research institutes given in the area of Agriculture (Olufolaji, 2019), science (The Nigerian Bioscientist, 2011) and entrepreneurship (University of Nigeria Nsukka, 2019) buttresses the fact that Nigeria is blessed with many research institutes.

Furthermore, examples of Higher/Tertiary institutions in the country are also another indication that Nigeria has researchers or potential researchers. Lecturers are expected to research and write academic papers while students are also expected to carry out research as they write their terminal projects. All of these researchers are expected to provide solutions to societal problems when they are commercialised.

Many scholars have written and researched on the importance of commercialisation and challenges of research and development commercialisation. For instance, Ukwuoma et al (2013) lists over twelve (12) reason non capitalisation of research and development results in Nigeria. These reasons range from lack of funding to lack of proper management amongst others. Countries that realised the importance of commercialisation setup agencies saddled with the onus of commercialisation of research and development. In a similar vein, the Nigerian Federal Ministry of Science and Technology on 27th January, 2017 formed a committee on blueprint for commercialisation of research and development (Uche, 2017). However, two years later, not much has changed.

Uche (2017) further quotes the Minister of Science and Technology, Dr Onu that, the poor intellectual property culture of Nigerian innovators and inventors is also an obstacle to research and commercialisation. This statement applies to us in higher education. Are we writing research papers simply because we have to write them to gain promotion or are we writing because we have identified a problem in the society and desire to provide a solution? Most often than not, we pass lack of vision to our students to. At the end of the day, students also write research projects because it is a requirement for them to graduate. In a nutshell, students and lecturers alike, take up irrelevant research topics that do not reflect the needs of the nation, plagiarism is on the rise as Uche (2019) states that, the sad trend of producing university research



findings that mostly end up in bins must be reversed. In case one assumes that she is using the bin metaphorically, she proves that she is using the term literally as she puts a picture thus;



*Culled from Techpoint Africa, July 6, 2017.*

If we do not believe the issue of the bin, most of us would agree that even if they do not end up in the bin, they definitely lie for ages in the shelves of offices, libraries or stores and accumulate dust over the years. This is similar to researches/academicians' research papers which end up in similar ways in other archives. Some are never opened in the journals they were published.

Academicians in higher institutions have to rise up to the occasion. According to Ibeme (2020) commercialization of research results is the drive for thriving economies. They should realise that as the custodians of knowledge, their jobs go beyond just lecturing and graduating students. Research papers should be written not just for the sake of promotion but also for the sake of providing beneficial useful solutions to the nation. Academicians who do this will be better equipped to groom their students accordingly. Only when academicians put their house in order they can confidently begin to blame the Federal Government for lapses on their part.



## RECOMMENDATIONS

Considering the discourse of this paper, the following recommendations are hereby made:

- i. Academicians should be made aware of what true research and commercialisation entails and its impact on the economy and their roles as not just lecturers but also researchers. Pamphlets, circulars, workshops or the social media in general can be used to disseminate this information.
- ii. The managements in tertiary institutions should in turn give proper orientation to both new and old staff in higher institutions on their roles as researchers in higher education. This is to ensure that useful research papers are written.
- iii. Appropriate bodies (e.g., Management, Academic Staff Unions, and Individual Researchers) should through their papers or activities, advocate for commercialisation of research ideas. For instance, the Tertiary Education Trust Fund (TET fund) funds can be extended to commercialisation of researches of those in higher education. Furthermore, a new body similar to TET-Fund can be commissioned and saddled with the responsibility of commercialisation of research ideas of researchers in higher education.

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