

RESEARCH COMMERCIALIZATION AND UNIVERSITY-INDUSTRY PARTNERSHIP IN NIGERIA

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ABSTRACT

This study on “Research Commercialization and University-Industry Partnership in Nigeria” aimed at analyzing the relationship that exists between Nigerian universities and industry. Ex post facto design that relied on secondary source (books, journal articles, internet materials, mimeographs and conference papers) were derived from Nigerian libraries. The documentary materials were subjected to content validity before qualitatively analyzed into the study. Findings revealed that Nigerian university has partnered with industry in academic areas such as; contract research, collaborative research, sponsored research, graduate fellowship/studentships, student projects and placement as well as university consultancy and associated commercial services. This partnership has assisted in facilitating funding, staff development, student industrial work experience scheme, including technological innovation. However, the partnership has challenges in the areas of funding, mind-set orientation, organizational structure and cultural differences, as well as intellectual property right ownership; according to findings. In order to strengthen the partnership, the study recommends, diversification of research funding, disclosure of research findings, staff exchange programmes including equal share of intellectual property right.

Keywords: Research, Commercialization, University, Industry, Partnership, Collaboration, Intellectual Property, Right, Government.

INTRODUCTION

Arguably, the main purpose of partnership between university and industry is to promote economic growth and development. Fernandes, Sullivan, Pinto, Arujo and Machado (2020) had acknowledged the contribution of university to the survival of industry especially in the area of research, teaching and knowledge transfer. Similarly, industry has provided the enabling environment and leverage “university research outputs and create innovative solutions that can result in widespread economic growth” (Ali & Dada, 2023, p. 181). Organization for Economic Cooperation and Development (OECD) (2007) posited further that university has played important role through provision of new knowledge and training of high skilled manpower, which industry depends. Industry on the other hand, had served as receiver of knowledge and technology from universities. This relationship or alliance that exists between university and the industry or private sector is often referred to as “university-industry collaboration.” One of the reasons for the university-industry collaboration is to assist in creating innovative solution that would result in widespread economic growth which the society would be the beneficiary.

Sutrisna, Tjia and Uju (2021) had identified three actors that can accelerate innovation in any organization. The actors are; industry, university and government. According to Alli and Dada (2023), “the industry is regarded as “wealth generators”, the university “novelty producer” while the government, which comes in between is regarded as “public controller” (p.182). Findings from academic research could only be commercialized, when the three actors; industry, university and government agree. Funding must be provided by the industry, while the university renders the knowledge. In the same vein government must provide the enabling environment for the university and the industry to operate.

Here in Nigeria, it should be recalled that the objectives of Nigeria industrial policy of 2013 were:

- (i) To encourage the private sector to play a pivotal role in the industrial development of the country.
- (ii) To increase industrial output and linkages for both domestic and export market.
- (iii) To increase value addition by creating few niches of competitive advantages.
- (iv) To increase capacities for entrepreneurship and technical skills in order to create more direct and indirect employment opportunities.
- (v) To increase competitiveness of made in Nigeria products.
- (vi) To facilitate inflow of foreign capital and technology and
- (vii) To encourage geographical dispersal of industries (FMI, 2013 as cited in Nnorom, Nwogu & Ukaigwe, 2024).

This industrial policy aligns with Nigerian education policy objective especially in the area of creativity. Creativity promotes chances for employment. Griffin and Care (2015) posited that the 21st century education must prepare students for new ways of thinking, ways that involve creativity, critical analysis, problem solving and decision making. Edet and Udidia (2023) added that, “students need to be prepared for new ways of working that will beckon on their communication and collaboration skill.... The employment that these students are likely going to enter will increasingly require critical and expert thinking skills and complex forms of communication” (p.77).

However, this can only be acquired through university education. University education in Nigeria, contributes to national development through high level manpower training, inculcation of proper values for individual and society as well as encouragement of

scholarship and community service. The earlier stated objectives of Nigeria Industrial Policy of 2013 can only be realized if Nigerian University which is the home for research collaborates with industry and government. The university must embark on research that extends beyond bridging of gap in extant literature (basic research) to offering solution to societal problems (applied research). According to Silas (2014), “the university research... is meant to develop the nation economically, politically, socially, morally and technologically” (p.58). Regrettably, Nigerian government, University and industry have not realized the need for collaboration. This could be one of the reasons why the economic challenges facing the country continue to persist unabated, irrespective of enormous effort made by the government towards its solution. Even Effah (2013) had confirmed that, “technology transfer and collaboration between most industries and universities is at very low level in developing economy and particularly in Nigeria” (as cited in Alli & Dada, 2023, p.183) Unlike Nigeria, Pakistan experienced economic growth and development in agriculture industry and services sector from 1991 to 1998, due to President Ghulam Khan’s commitment to funding of university research. The Pakistani universities, industries and government collaborated in solving the social, economic and political problem of the state. Khan and Rehman (2014) confirmed, “Pakistani economy grew at the rate of 2%... research, plays an important role in economic growth of the country through technological advancement and spillover effects” (p.3). This introduction could be extended beyond the scope of this study however the presentation requires few questions that need immediate answers:

1. Which areas of academic activities require partnership between university and industry in Nigeria?
2. What are the benefits of university-industry partnership in Nigeria?
3. What are the challenges facing university-industry partnership in Nigeria?

Structurally, this study is divided into four sections. The first section deals with area of partnership between university and industry while the second section focuses on university-industry partnership. Third section is concerned with the challenges facing university-industry partnership. While the fourth part deals with concluding remarks and references.

Materials and Method

Research design adopted for this study was ex post facto. Ex post facto design assisted in establishing the relationship between the independent (research commercialization) and the dependent variable (university-industry partnerships). Secondary source (books, journal articles, conferences papers, internet materials and mimeographs) were used extensively for the study. These documentary materials were sourced from Nigerian libraries, subjected to content validity, before analyzed qualitatively into the study. Though populations are from Asian, American, European and African universities, Nigerian university constitutes the sample of the study. The choice of Nigerian university was purposive, in view of the fact that it has more researchers than any other African countries. The numbers of universities in Nigeria outstrip its counterpart in African states, hence justifies the study.

Areas of Partnership between University and Industry in Nigeria

Despite the fact that university is the home for intellectuals while industry hosts managers, there is a tendency for the two to collaborate in certain academics areas for the welfare of mankind. Citing Polizzotto (2000) Nnorom Nwogu and Ukaigwe (2024) identified the under-listed academics areas that require partnership between university and industry.

(i) Contract Research

Indisputably, university is blessed with intellectuals with sound knowledge in their different fields of specialization. Regrettably, these intellectuals are financially handicapped and the university cannot sponsor nor fund their research. Industry accepts the responsibility to sponsor and finance the research. Usually, contract research involves project specifications as well as technical staff that are sponsored by the industry, but under the supervision of an academic staff. The result of the findings belongs to the industry and the industry has exclusive right to use and exploit the result commercially.

(ii) Collaborative Research: Collaborative research requires both university and industry equal participation in funding and staffing. The university would provide academic staff and certain amount of money for the execution of the project. Industry is expected to do same. However, the result of the finding belongs to both of them. None can use nor exploit the result of the findings for commercial purpose without acknowledging the other partner.

(iii) Sponsored Research: Here, academic staff is expected to submit his research proposal to the industry for approval and funding. The industrial partner does not contribute to the proposal but accept to fund the execution of the project. However, the result of the findings must be published. The academic staff and the industry must negotiate on the details concerning publication and access right.

(iv) Graduate Fellowship / Studentships: In developed nations, industries sponsor graduate fellowship / studentship in certain fields of their needs. Those that have opportunity to be enrolled into those programmes are fully sponsored by the industry. Shell and Mobile have been sponsoring Nigerian students in various fields. Some students have benefited from M.Sc/M.Tech, M.Phil even Ph.D sponsored by the multinational oil companies within and outside Nigeria. Expectation is that beneficiary must conduct research that is related to the area of sponsorship. University requirements for award of degree do not entail such criteria.

(v) Student Projects and Placements: Student projects and placements strengthen relationship between university and industry. Project students can visit industries for the purpose of gathering data. They can also be in a project site to acquire practical skill. Similarly, student placement, especially Students Industrial Work Experience Scheme (SIWES) acquaints students with practical skill from industry. Knowledge from the industry enhances chances of future employment.

(vi) University Consultancy and Associated Commercial Services: Academic staff are encouraged to render community, commercial as well as consultancy services to outsiders. Consultancy is different from research, since it does not generate knowledge rather it extends knowledge to communities. Therefore, industries and other beneficiary of university consultancy services are expected to pay for the knowledge.

Benefits of University-Industry Partnership in Nigeria

Unarguably, the 21st century's knowledge driven economy needs collaboration between academic and private sector. This collaboration would promote growth and sustain knowledge. In 2011, Romania New Education Law emphasized partnership between educators and business people. The Presidential Strategy on Education and Research for the Knowledge Society of Romania strongly recommended the need for synergy between university, business and government for the purpose of development and quality assurance.

In the same vein, Europe 2020 Strategy for Smart, Sustainable and Inclusive Growth hinted on the need to develop an economy that base on knowledge and innovation. Burdassel, Balam and Plohod (2012) explained further that such economy would “promote resource efficient greener and competitive economy that can sustain growth and foster high employment opportunities” (p.6).

Relating this, to the topic under discussion, there is no dispute that university and industry derive benefits from partnership. University provides knowledge while industry gives job. Graduates from the university need both knowledge and job. A good university provides general academic training for the best students and prepares them for employment. Industry expects to employ students with good and sound academic background. Such students can add value to the industrial world and promote growth and productivity wherever they find themselves. Regrettably, most graduates from Nigerian universities are not employable due to the fact that the trainings they obtain from schools do not contain the required skill that can promote industrial productivity. Pauw (2008) decried that, “Nigerian universities do not meet the requirements of industries and wider economy. This mismatch coupled with undertraining in the critical skills of problem solving, analytical thinking and communication is blamed... for the emerging high graduate unemployment and underemployment (as cited in Ibeme, 2021, p. 101). This gap between knowledge and practice can only be bridged through partnership. University and industry must cooperate for the sake of the students and the entire society. As Ibeme (2021) further stated: “...Universities need to produce work ready graduates with the requisite skills for the job market... university should play pivotal roles in applying research and innovation to address socio-economic problems, and promote innovation for economic growth” (p.106).

Similarly, universities in Nigeria are seriously in need of funding. This funding would enable Nigerian universities to access or acquire state-of-the-art equipment, improved curriculum and train manpower in technology oriented programmes. Martin (2002) posited that adequate funding would enhance employment prospects for students and supplement income for academic staff. Inadequate funding could only be a thing of the past if Nigerian universities commercialize its research findings. Commercialization of research findings entail payment of royalties to universities, sales of research findings, sales of intellectual property right, sales of product developed by universities as well as patent licensing. Universities can also generate funds through consultancies services to both organized public and private sector. It can also organize commercial business venture and collaborate with multinational business corporations for the purpose of raising funds.

This corroborates Adelokun’s (2001) opinion that “mutual association with the industries is likely to bring about mutual benefits (as cited in Nnorum, Nwogu & Ukaigwe, 2024, P. 139). Even Okejim (2016) had suggested that universities should establish filling stations, embark on agricultural activities (poultry, piggery, crop farm, palm/plantain plantation, fruit garden, among others) for the purpose of generating fund. The fact is that universities have the knowledge to partake in agricultural activities, but the technical knowledge for these projects resides in private sector. Therefore, there is a need for collaboration. Alli and Dada (2023) also added that, “researchers and research institutions must, therefore, look for alternative sources of funding and which industry can provide. Universities are, therefore, supposed to partner with companies and firms in financing specific research that are tailored towards solving specific problems of the industries (p.187).

Furthermore, universities and industries also collaborate in enhancing training for both students and staff. Science students from Nigerian universities are expected to participate in

Student Industrial Work Experience Scheme (SIWES). This industrial experience scheme enables Nigerian students to acquire industrial skills, interact with practitioners and relate with people outside the classroom. The knowledge that Nigerian students obtain from the university and the skill that they acquire from industry assists in preparing them towards future employment. In Thailand, there is a programme known as Teachers Industrial Work Experience Scheme (TIWES). University teachers and researchers are encouraged by the government to acquire industrial skill that could improve their classroom performance. According to Fuentes and Dutrenit (2012), “this policy... encourages university researchers to spend some time working in industry as full time or part time staff. This kind of interactions can improve business productivity and entrench innovation...” (p.1667). University also employs technical and professional staff from industry as adjunct lecturers and guest speakers. This category of staff from industry, assist in providing entrepreneurial advice and offer attachment as well as placement to students from university. Ibeme (2021) posited that this partnership can “enhance graduate employability as a result of improved curricula, skill development and internships, as well as increased job satisfaction” (p.107).

Additionally, university-industry partnership promotes innovation in technology. University acquires technology through research while industry transforms the research findings into practical use. For instance, machines industry uses in production of goods are product of rigorous research from university. Industry that uses the machine can inform the university researchers about the performance of the machine. The researchers are free to improve the quality of the machines through further findings. Dill and Yught (2010) alerted that, “this can only be achieved through an effective partnership between the industries and the universities” (p.18). There are many ways universities can contribute to technological innovation. These include; embarking on research in technological areas that are important to industry, giving technical assistance to local firms, educating well-trained professionals as well as encouraging faculties to engage in consultancy and commercialization activities (Geiger & Sa, 2015). Most industries, especially oil companies (Mobil Plc, Shell, Elf, British Petroleum etc) are encouraging linkages with universities, through granting of sabbatical leave, as well as award of scholarship to university researchers and students. As Chesbrough (2013) posited, “firms’ readiness to seek out multiple sources of knowledge is viewed as critical for their success in fiercely competitive market” (p.20).

Challenges Facing University-Industry Partnership in Nigeria

Though university-industry partnership has contributed immensely to economic growth, regrettably, access to funding constitutes a major obstacle to their collaboration. In a study conducted by RAND Corporation (2011), African countries (except South Africa, Egypt, Mauritius and Republic of Benin) were rated low in education research, due to poor funding. Collaboration with the industry requires funding, unfortunately, most industries in developed and developing countries are not ready to volunteer the cost. The expectation is that university should involve in part payment of research bill, however, many universities cannot fulfill this obligation due to inadequate funding by their proprietors, especially in Africa. Ibeme (2021) decried that “at the institutional level, universities in Africa have long been facing funding difficulties due to limited state resources... with limited funding and support to their research mission, universities are usually hard-pressed to initiate and sustain programmes of research” (p.108). In the same vein, late release of research grant from industry to the university equally affects timely release of research findings to the industry. This can hinder the partnership and breed distrust in relationship.

Similarly, university and industry operate in different environment with different orientation as well as goal. Therefore, harmonizing the two institutions for a common purpose must surely bring problem. Unarguably, the major aim of the university is to disseminate knowledge and expose unknown to the wider society through basic research. Industry aims at making profit as well as offering solution to societal problem through applied research. Workers from these institutions exist with these two mindsets. As Ulrike (2021) stated, “the traditional purpose of a university is to preserve and spread knowledge through research. Their mindset is to share know-how. On contrary, the purpose of a company is to return value to its shareholders... with such diverse mindsets, a successful cooperation faces obstacles” (p.57). Again, their attitudes to work equally differ. University staff do not have target. They are not pressurized to render service. Those that work at night choose to do so voluntarily. Their monthly salaries are not subjected to amount of productivity. On the contrary, industry workers have a certain target to meet on daily basis. They are expected to accomplish a certain goal. In order to achieve the goal, workers must be industrious. Some of them spend night at their work place. Payment of salaries and allowances are subjected to productivity. A worker earns what he or she merits, not the other way round. Normah (2011) confirmed that, “there is a mismatch between the universities’ and industries’ working styles. The university staff is not willing to work extra hours whereas the industry staff has to work until late night and also during weekends. It is normal for the industry staff to work without proper night sleep...” (p.99).

The organizational structure and cultural differences constitute another challenge in their partnership. University has flexible organizational structure. The highest office-holder is the Vice Chancellor with 5 years duration (Nigerian context). Other positions in the university, such as, Directors, Deans, Heads of Departments, Coordinators of Programme, Examination Officers among others can be appointed or remove whenever Vice Chancellor sees the necessity for such action. Unlike the Chief Executive Officer (CEO) of an industry who can only be removed after the expiration of the statutory period. Added to this, Directors in industry can only be relieved of their appointment on death, dismissal, resignation or retirement ground. They work with enough resources. The structure is hierarchical and the communication channel can never be bridged. This is not the same with university system. Highlighting the organizational superiority of industry over university, Ulrike (2021) hinted that “job position and responsibilities are clearly defined, resources are well planned in advance and hierarchies seem endless... Matching the partners-organizational set-up and values is, therefore, not an easy task...” (p.57).

Additionally, sharing of Intellectual Property Right (IPR) is another issue that affects university-industry partnership. The first problem is the property confidentiality. There is a decline of trust between university and industry in sharing confidential information. University academia often refuses to disclose all the information relating to research findings to industry, even when the research is jointly sponsored by the industry. On the other hand, industries are skeptical to release all information that could assist university to achieve a breakthrough in their area of interest. Farah and Mohammad (2019) posited that, “the issue in confidentiality does not only applied to the industry, but also the academic... there are a number of researchers that are not always willing to share their information with the industry as they want to be closed only to them” (p.9). Royalty payment also hinders cordial relationship between university and industry. The university provides the knowledge while industry provides the fund. The question now is, who should take largest share?

Concluding Remarks

Industry requires research findings, conducted by university academic. That would enable them to give practical solution to the societal problem. University also needs industry for the purpose of funding research that can expand the frontiers of knowledge and offer succor to challenges affecting mankind. Therefore, there is need for partnership in the areas of contract research, collaborative research, sponsored research, graduate fellowships / internship, student project and placement as well as university consultancy and associated commercial services. This study further highlighted benefit university derives from its partnership with industry. It promotes funding, staffing, technology transfer; including employment opportunity. Regrettably, university-industry partnership is affected by inadequate funding, organizational and cultural differences contrary mindset, including sharing of intellectual property right. In order to overcome these challenges and strengthen university-industry partnership, the lecture recommends:

- (i) **Diversification of Research Funding:** University can allocate certain percentage from student school fee, consultancy services, community services among others to research. This would reduce reliance on industry on funding.
- (ii) **Disclosure of Research Findings:** University and industry should be ready to share information relating to their research findings. The major aim of research is to solve societal problem. Therefore, hiding research findings is harmful to humanity.
- (iii) **Staff Exchange Programme:** University and industry staff should embrace staff exchange programme. This programme would enable academic staff to have 1 year practical experience in industry. Industry staff should also be employed in Management, Engineering, Agriculture, Natural and Applied Science Faculties for 1 year programme. This period would assist in enhancing their theoretical knowledge.
- (iv) **Equal Share of intellectual property right:** University and industry should share royalty payment equally. Though knowledge is superior, one should not forget that money is paramount. Equal share of royalty payment from intellectual property right would bring harmony and strengthen university-industry partnership.

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