

Tertiary Education Trust Fund's Role in Connecting HEI and Companies to Accelerate Nigeria's Economic Development

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Abstract

Nigeria has the potential to become a solid and formidable force in the global economy but is still one of the poorest nations with low per capita income. The Tertiary Education Trust Fund aims to facilitate connections between higher education institutions and companies to accelerate economic development by translating research into market products and services. This paper is a literature review of how and why government-academia-industry partnerships succeed or fail with the intent to guide the agency and other similar organisations in their task of connecting academia with companies. Factors for effective academia-industry partnerships identified include policies, stakeholder engagement, addressing cultural differences between academia and companies, intellectual property negotiations, boundary-spanning, trust, communication, and capacity-building initiatives. It concludes by recommending a triple helix model where the government, companies, and academia will work collaboratively and suggests an exploratory study of the field in Nigeria, which is currently lacking.

Keywords: higher education institutions, triple-helix, research and development, innovation, Economy development, TETF

INTRODUCTION

Educated and skilled human resources are the backbone that helps to build innovative capacities in economies as they move from factor-driven to efficiency-driven and then to knowledge-driven economic growth. Knowledge has been acknowledged as an essential factor and its impact as a critical productive force that causes economic growth in all types of economies (Landes, 1980). Wealth creation and employment generation depend on knowledge and innovation (Tocan, 2012). Most economists would probably agree that a nation's human resources, not its natural resources, ultimately determine the character and pace of its economic and social development. For instance, as early as in 1973, Professor Frederick Harbison of Princeton University has argued that:

Human resources ... constitute the ultimate basis for the wealth of nations. Capital and natural resources are passive factors of production; human beings are active agents who accumulate capital, exploit natural resources, build social, economic, and political organisations, and carry forward national development. A country that cannot develop the skills and knowledge of its people and utilise them effectively in the national economy will be unable to build anything else (Bogoro, 2018, 1).

It has been generally accepted that "knowledge" is one of the critical factors of economic and social development - a "main driver of growth" (World Bank, 2002). As economies rapidly become more knowledge-based, knowledge activities enhance productivity, create national wealth, and sustain economic growth and competition (Veselá & Klimová, 2014; Alkali, 2021). Governments across the globe have tried to achieve competitiveness by 'solidifying policies and institutions that support innovation' (Alkali, 2021), which includes leveraging science, technology and innovation policies, higher education, and industry (Rybnicek & Königsguber, 2019).

Thus, the level of investment by governments in innovative research and development, in particular, determines the global competitiveness of their nations. The process for Nigeria to catch up with the globalised economies can be enhanced by developing a solid framework for the connection between higher education institutions and industries for innovation to thrive and lead to products and services, thereby enhancing its Gross Domestic Product (GDP) and reducing imports. The country is not doing well in innovation, as it ranked 109th out of 132 among the most innovative countries in the world, according to the 2023 Global Innovation Index (GII) (World Intellectual Property Organization, 2023). Investing in Research and Development (R&D) has also been crucial for ensuring long-term economic transformation to achieve a knowledge-intensive development agenda (Matyushok et al., 2020; Zafar et al., 2019; Kim, 2019; Ali et al., 2020). That can be achieved through effective and sustainable connections between higher education institutions and industries. Nigeria, therefore, needs to leverage its intellectual assets, domiciled mainly in the higher education system, especially in the universities, polytechnics, and colleges of education, to develop its knowledge base system and develop a sustainably efficient, effective, and sustainable economy as an alternative to its overdependent on oil and other natural resources as the mainstay of the nation's economy. Nigeria has yet to use these resources to develop its knowledge-based system, accelerate its economic competitiveness, and ensure its prosperity.

This paper is a systematic literature review on academia-industry partnerships with a view to proffering lessons to the Tertiary Education Trust Fund (TETFund) in particular, and other similar government institutions in general, on the best models to effectively connect higher education institutions with companies for accelerated economic development. It also aims to identify gaps within the literature reviewed and draw implications for Future Research within Nigeria's Context. It will also

examine critical barriers to sustainable and effective academia-industry partnerships and solutions to them as espoused by literature.

This paper is necessitated by the fact that there is a near absence of connections between higher education and companies in Nigeria, despite the potential benefits and prospects. So far, we have come across only Alkali's (2021) empirical study that focuses narrowly on two northern universities and six-intensive software and hardware companies. Alkali's study did not also study the government's role in connecting the HEI and companies. Even though some studies have earlier focused on TETFund intervention, which includes the assessment of critical stakeholders' conflict factors on TETFund building construction projects in southwest Nigeria (Ijigah et al., 2023), the impact of TETFund interventions on industrial peace in a university in southwest Nigeria (Fejoh & Adesanwo, 2021); and factors affecting time performance on TETFund construction projects in North-east Nigeria (Mukhtar et al., 2021). However, none of the studies focused on the subject of HEI-company linkages. Thus, we attempt to address the following question: What, according to the literature, are the enablers and success factors for a successful connection between higher education institutions?, What lessons would TETFund learn from that place in its attempt to connect Nigeria's higher education institutions with local companies to accelerate the country's economic development?

The Need for Connection between HEI and Companies

Open innovation supports the belief that industries and higher education institutions do not 'necessarily have all the competencies to perform every operation in-house, so they search for partners to share their 'problem' and, in the same way as before, to come to the wishful results' and help in 'solving the set of difficulties', which may not be solved individually (Lukac & Chatzimichailidou (2017, 91). In collaboration, all actors are expected to bring their intellectual assets and practical support into a particular project(s) to produce products and services appropriate for the market. In collaborative efforts, the HEI and the companies benefit from the partnership. Companies lack access to all requisite competencies, services, assets, etc. At the same time, HEI 'try to gain financial support for their work, to commercialise their academic research results and with it, their status within the academic society' (ibid, 93). Ahmed et al. (2022, 1) sum up thus: 'Academia and the industry are analogous to two sides of a river that must flow independently... creating linkages between the two sides of the river has the potential to contribute to the betterment of both.' Ahmed et al. (2022) reiterate the importance of an academia-industry alignment to better prepare students for the workforce and facilitate a more seamless transition into professional roles.

Collaboration between higher education institutions and companies is thus essential for developing relevant skills, creating and disseminating applied knowledge, and promoting entrepreneurship (Arthur, 1996). Entrepreneurship enhances the linkages between the institutions and industry by ensuring that what they do as sources of knowledge is relevant to the industry. Knowledge transfer via collaboration will ensure fundamental understandings are established and understood, enhancing performance. It is also known that because of limited resources and skills shortages, most higher education institutions' research output will typically require adaptation to suit industrial applications (Plewa & Quester, 2006). Concerning developing nations, HEI can help advance industries by enhancing the technical level of the people and by sharing new scientific insights (Marotta et al., 2007).

Regarding HEI, pressures have included the growth in new knowledge and the challenge of rising

costs and funding problems, which have exerted enormous resource burdens on the institutions to seek relationships with firms to enable them to remain at the leading edge in all subject areas. In addition, there is mounting societal pressure on HEI for them to be seen as engines for economic growth (Macey et al., 2010). These pressures on both parties have led to an increasing stimulus for developing partnerships to enhance innovation and economic competitiveness through knowledge exchange between the collaborators (Galib et al., 2015).

Aziz et al. (2021) summarised the need for academia-company partnerships as follows:

- It helps the academia to tackle the problem of decreasing public funds.
- Allows businesses to gain and sustain competitive advantage in ever-changing markets.
- Contributes to regional and national economic development.
- It helps industries meet the demands of the labour market by providing more relevant knowledge and skills and higher job opportunities for students.
- It supports the creation of a knowledge economy.
- Helps job creation and stimulation of economic growth.
- Supports local businesses and improves living standards.

THE TERTIARY EDUCATION TRUST FUND: ATTEMPTS TOWARDS HEI-COMPANY PARTNERSHIPS

The Tertiary Education Trust Fund (TETFund) was established in 2011 to administer and disburse education tax collections to the public tertiary educational institutions in Nigeria, defined under the Act as universities, polytechnics, and colleges of education. The primary source of income available to the Fund is the 3% education tax paid from the assessable profits of companies registered in Nigeria. The Fund administers the tax imposed by the Act and disburses the amount to tertiary education institutions at federal and state levels. That is done through various interventions (Tertiary Education Trust Fund 2021, 2024).

In implementing its mandate, TETFund established the Department of Research and Development/Centres of Excellence in 2014 to promote the institutionalisation of R&D through practical support for impactful research and innovative partnerships between tertiary institutions, industry, and government as a national response to the technological revolution, knowledge-based economy, and sustainable national development. One of the authors has been the Director of the Department since January 2020.

The Department is responsible for coordinating, managing, and implementing the TETFund's research intervention lines, which enhance research capacity and capability in HEI to promote market-driven research that has a national impact and supports multidisciplinary research. It is also responsible for fostering partnerships between the Fund, HEI, and Industries as it relates to the research works by implementing the appropriate mechanism for adopting and utilising research findings to promote the commercialisation of viable research and development results and patents (TETFund, 2021).

To support and facilitate HEI-company collaboration, the Fund came up with several initiatives, such as the National Research Fund (NRF) intervention for funding cutting-edge research, mainly in the areas of national priorities, as well as created an intervention line known as 'Entrepreneurship Intervention for all universities', where funds are allocated annually to introduce students to entrepreneurship skills (Tertiary Education Trust Fund, 2024).

The TETFund has also been supporting a programme known as 'the Innovation Fellowship for Aspiring Inventors and Researchers (i-FAIR) programme as one of the sponsoring partners. The Israeli Embassy in Nigeria organised the i-FAIR programmes to support scientific researchers, innovators, and entrepreneurs passionate about using innovation to solve societal problems. Some of the lecturers who participated in the i-FAIR programme came up with patented innovations. Furthermore, the agency is providing Innovation Hubs and Central Multipurpose Laboratories in tertiary institutions across the geo-political zones as essential scientific research facilities needed to promote an enabling environment to enhance impactful and innovative research outputs for industry and accelerate the competitiveness of the institutions for national development (Tertiary Education Trust Fund, 2024).

In addition, the TETFund Alliance for Innovative Research (TETFAIR) programme was initiated to pull scientific researchers, innovators, and inventors from tertiary universities through a competitive selection process to accelerate their research, innovations, and inventions with the aid of state-of-the-art innovation hub, experts and mentors to enable them to transform their ideas into innovative solutions up to Proof of Concept and Prototypes that can be pitched to investors for commercialisation. In 2022 and 2023 alone, these two Programmes have given rise to 106 prototypes (TETFund, 2023). Furthermore, the Fund has funded 9,764 basic research in the institutions between 2020 and 2023, distributed as follows: 3,733 in universities, 3,393 in polytechnics, and 2,638 in colleges of education (ibid).

Despite the efforts highlighted in the preceding paragraphs, TETFund has not succeeded in connecting companies with higher education institutions. So far, the effort has yet to record any breakthrough in consummating partnership between any other public HEI and any company, and there is no evidence of uptake of any of the Fund's funded research by any industry. There is, thus, the need for change in strategy. Such a strategy requires evidence-based solutions, so the Fund's intervention in connecting the institutions with companies will be fruitful (Tertiary Education Trust Fund, 2024).

ENABLERS AND SUCCESS FACTORS FOR EFFECTIVE HEI AND COMPANY PARTNERSHIPS

The industry is driven to earn a profit and implement research findings but does not need to publish their findings. The opposite is the case for academia: they need to publish, but they do not necessarily focus on earning money or implementing their findings (Plewa & Quester, 2006; Agrawal, 2001).

A study by O'Dwyer et al. (2022) employed the qualitative interpretive research approach, utilising the single-site case study of collaboration between eleven multinational pharmaceutical companies and seven academic institutions in a relatively small European country. The study focused on university collaboration with competing partners in a competition. The study identified three categories of enablers/barriers, namely individual, organisational, and institutional, and several key themes, including project management skills, effective communication, trust, flexibility, strategy, commitment, and compromise to ensure synergy between academic goals and industry objectives that dictate that success or failure of university-industry collaboration. Perceived barriers include scepticism, fear, and academic unwillingness to share knowledge and resources. Research shows that academia and industry have difficulty understanding or appreciating the other party's goals, cultures, or constraints (Lee, 2000; Burnside & Witkin, 2008). The following have been cited in the literature as barriers to effective collaboration.

Cultural differences

Academia and industries are two different cultural entities and, as a result, differ considerably in the nature and objectives of their activities. Literature shows that cultural differences, perceived lack of academic expertise and reputation, inadequate institutional policies, lack of trust, lack of effective communication, inadequate reward system, and issues around Intellectual Property rights are some of the foremost barriers/challenges to effective academia-company connections (Azman et al., 2019; Lukac & Chatzimichailidou, 2017; Rossi et al., 2022; Ahmed et al., 2022; WIPO, 2023; Suparno & Ekopriyono, 2022; Corsi et al., 2021). These typically could create friction. Cultural barriers are pervasive because stakeholders have different norms, standards, and values. These cultural differences manifest in various forms, including freedom of publication of research results versus secrecy of the research findings. Typically, Industries do not want researchers to publish their results and share information. Instead, they view technology as something to be kept proprietary and used for strategic advantage in pursuing profits (O'Dwyer, 2023).

Azman et al. (2019) studied stakeholders' perspectives on expectations and impediments to promoting university-industry collaboration in Malaysia and succinctly discussed those cultural barriers to collaboration. Citing an academic interviewee, they stated, 'The biggest issue is that the academics and the industry speak different languages, have different cultures, so we cannot expect the industry to understand what we value at the university level...!' (Azman et al., 2019, 92). Aligned with the cultural barrier is the issue of differing priorities and perspectives. In the Azman et al. study (ibid), respondents from the industry expressed frustration with academic partners over missed deadlines and lack of adherence to agreed schedules, creating accountability and reliability issues. Thus, arising from the previous, it culminates distrust between the two parties: industries are sceptical about the university's capability, and Universities are not so sure about the motives of industries, which cause our inability to optimise the collaboration'. Those related to cultural differences included academia's inflexibility, 'the absence of an outcome-oriented culture, communication style, and bureaucracy' (ibid. 98). Cultural factors could lead to conflict. Hewitt et al. (2020) identified three types of conflict in knowledge sharing: process, relationship, and task, all underpinned by cultural differences.

Intellectual Property negotiations

Intellectual property rights issues could represent barriers that prevent the sought-after research collaboration from ever coming about (Hall et al., 2000). Researchers would want the protection rights of inventions even before proceeding with the partnership. Industries may also expect ownership of the technology through their investment in development, resulting in complex negotiations. Nishimura and Okamuro (2010) explained that UIC's legal aspects and intellectual property rights (IPRs) are significant.

Knowledge Management

Knowledge Management (KM) has not been a common subject in investigating academia-industry collaboration. When it comes to KM of HEI-Industry Collaborative projects, there is a lack of practical guidance to support individuals from different 'worlds' in the cocreation of knowledge and innovation, thereby developing the absorption capacity of both organisations (Lee, 2000; Burnside & Witkin, 2008; Perkmann & Walsh, 2007). Thornley et al. (2019, 1016) further observed that academia-industry collaboration 'presents a complex challenge regarding KM. This is partly due to the wide

range of stakeholders, the impact of government policy, and the different cultures, practices, and expectations of those involved. They argue that there is no noticeable input from KM research and theory on how academia-industry collaboration works and how it could be improved. Thornley et al. (2019, 1021) stressed that KM could gain from investigating the rich context of knowledge within academia-industry collaboration and their role in innovation strategies, while Pudjiarti et al. (2022, 467) found within the context of Indonesia that 'KM mediates the relationship between UIC (university-industry collaboration) regulation implementation and academic performance so that universities are supported in implementing policies to build a culture of knowledge'.

The Enablers and Success Factors

Many studies have investigated the drivers for interaction, how these interactions are characterised, and the influence of such interactions on firm innovation. Sustainable collaboration requires an active effort on both sides (Freitas et al., 2013; Albats et al., 2020). Based on an extensive review, Rybnicek and Königsgruber (2019) identified four factors that determine collaboration:

- Institutional factors refer to participating institutions and their availability of critical resources such as finance, time and equipment, structure, clearly defined responsibilities and roles, mutual terminology, and organisational culture, as well as the willingness to change and learn about and understand one another.
- Human (Relationship) factors refer to human capital and research. Relationship factors refer to the personal interface between an academic and an industry practitioner. Despite the different communication styles in educational and business environments, the relationships between academics and practitioners can be positively impacted by regular interaction, continuous feedback, and mutual exchange of information through various channels.
- Linkage (output) factors refer to relationships between HEI and companies. Output factors refer to strategies, visions, goals, plans, or expected outcomes that impact the collaboration. If the goals are compatible, the desired outcomes will be achieved. It is essential to understand the other party's interests and to create a win-win situation in which the benefits are correctly balanced.
- Framework factors refer to broader environmental aspects such as the government, legal restrictions, regulations (roles and responsibilities, confidentiality and non-disclosure agreements, Intellectual property rights), and geographical distance that determine whether communication is done face to face or online.

According to Sun and Turner (2022), there is a need for clear communication of the shared vision and laying a foundation of trust and understanding at the engagement stage. Early conversations on goals, motivation, role, expertise, realistic expectations, and timelines on deliverables to ensure clarity of purpose and ease concerns that partners might have about the collaboration are essential. To achieve trust and effective communication, Luka and Chatzimichailidou (2017, 73) suggested a 'commonsense approach' where collaboration develops gradually: 'instead of implementing strict procedures, the cooperation is developed by mutual tendency.' They concluded that 'much of the steps in one successful cooperation can be commonsense based and triggered by circumstances, rather than formally defined. Less formalism, with a certain amount of reasonable human and business understanding, can be a success factor for long-term partnerships' (Luka & Chatzimichailidou, 2017, 95).

To Ahmed et al. (2022, 3), 'planning a collaboration process is imperative'. The World Economic Forum (2018) has also suggested that for African universities to connect effectively with industries,

there is a need for the following: Development of global partnerships, establishment and leveraging of formal platforms for communication and collaboration, clarity of partnerships' expectations with a focus on deliverables, institutional support through provision of tools needed to drive company collaboration and strengthening of intellectual property protection. Suparno et al. (2022, 180), citing Healey et al. (2014), stated that the principle of mutual understanding binds the partnership between academia and industry in its implementation, which includes 'the principle of participation, the principle of cooperation, the principle of transparency, the principle of law enforcement; rights and obligations, leading to right-obligations, rewards, and punishments, and the principle of sustainability'. Highly qualified human resources are paramount, with unrestricted access to libraries, laboratory space, and similar infrastructure and/or technical equipment (Boardman & Bozeman 2015).

The role of boundary-spanning practices has been acknowledged as a significant success factor in HEI-company collaborations. It is defined as 'brokering information by facilitating and managing knowledge inflows and outflows between two organisations' (Tushman, 1977 in Corsi & Kulzer-Sacilotto 2021, 311). According to Corsi and Kulzer-Sacilotto (2021, 311), the role of boundary spanners is to 'bridge, filter and mediate the exchange of information between an organisation and its external environment as well as coordinating and intermediating their collaboration'. Boundary spanners are institutions, groups, or individuals that straddle the divide between information producers and users to produce boundary products or tools that enable effective communication between these two groups and are accountable in some fashion to both groups (Awasthy et al., 2017). Rossi et al. (2022) investigated how adopting boundary-spanning practices influences how firms collaborate with universities to explore innovation pathways in the UK. They found it to be a significant determinant for partnerships and critical in building a sustainable trust-based connection between HEI and companies. Through fostering collaboration with industry, boundary spanners were reported to have facilitated the establishment of local innovation clusters in local British universities and are critical for the creation of university-based innovation ecosystems (Suparno et al., 2022; Corsi & Kulzer-Sacilotto, 2021).

Government policies also play a critical role in determining the effectiveness of HEI-company collaboration. Developing an effective collaborative innovation model will influence academia's involvement in cooperation activities with the industry. Three layers make up the innovation system are discussed (Siegel et al., 2003):

- Industrial clusters within a country (producers, buyers, and suppliers).
- Institutions and organisations that support the learning process in industrial clusters. These include HEI, financial institutions, physical infrastructure, and technological support.
- Set of policies that stimulate the learning processes between industrial clusters and institutions. These policies include political and macroeconomic environment measures, trade and competition regimes, tax regimes, and legislation.

Deliberate efforts by governments to encourage academic innovation serve as a foundation for economic development and a sustainable future. Factors such as changes in legislative environments, governmental initiatives to promote knowledge transfer, and public-private partnerships in research, as well as the increase of political pressure for academic institutions to help the improvement of national economic competitiveness, have contributed to a growing approach of the HEI and the industry. Policymakers, therefore, should become more actively involved rather than just as regulators, providing adequate environments for firms to establish relationships of trust with Communities and

relevant stakeholders (Hafkesbrink et al., 2010).

TETFund's Role to Connect HEI-Company Connections in Nigeria

TETFund, as a government agency, needs to change its strategy from the position of a 'bystander' to that of an active participant in connecting the HEI and companies. So far, interventions by the Fund have focused on providing equipment and capacity building to HEI in Nigeria to enable them to communicate with the companies, which has not happened. It is apparent that cultural barriers, lack of open communication, distrust, and organisational differences in aims, goals, and processes are likely substantial obstacles to the desired connections. This assertion was also found by Alkali (2021) in his pilot study of interactions between two universities and six firms in Nigeria. It is, therefore, logical to conclude that for HEI to connect with companies effectively and sustainably in Nigeria, there is a need for an intermediary or a boundary spanner that can connect the two parties to kick-start a relationship. If ignited by a third party, there is the likelihood of gradual continuity or through a 'commonsense approach' as advocated by Lukac and Chtazimichailidou (2017). TETFund is an appropriate boundary spanner because of its interaction with both the HEI and companies.

Whereas the agency collects tax from companies for its operations, it also uses those funds to support HEI in implementing its mandates. It also organises annual interactions with both the companies and the HEI. Thus, both the companies and the HEI will likely listen to one another through the intermediation of the Fund.

TETFund needs to learn from the Triple helix, a model that advocates three interacting components – government, academia, and industry 'to compensate for the shortcomings of each other' because when 'problems are approached collaboratively, the chance of a new start-up increases exponentially' (Ahmed et al., 2022, 4). The triple helix collaboration, at times, may lead to the establishment of hybrid organisations, such as technology transfer offices in HEI, firms, and government-funded research laboratories. The triangular model of higher education systems, which includes the state authority, the consumer, and the academic- triangle of coordination, also known as the Triple Helix of academia–industry-government interaction, increasingly provides a basis for innovation (Perkkmann et al., 2013; Etzkowitz, 2003; Jacob, 2006). A Triple Helix innovation model as a relationship framework has been widely used in Knowledge-based economies and innovation studies to highlight the dynamic and changing roles of the different actors involved in the innovation process.

Through TETFund intervention, HEI and companies can be supported to open communication channels and build trust between them. The agency can also create appropriate platforms for enhanced understanding between the companies and HEI. In addition, the agency needs to support the HEI in the following areas:

- HEI needs to play a more proactive role in commercialising research results, demonstrate the applicability of research for industry in a relevant context, and promote their research outcomes. This suggestion will help HEI align its company research goals and national economic needs for a more significant impact.
- Collaborative Platform – To address the lack of visibility of their research, HEI needs to create digital platforms where people can reach out to relevant contacts to discuss ideas and achievements. However, there is a concern about the willingness of people to share their research ideas, which can be addressed by adopting a strategy to encourage people to network, gain mutually, and share. A comprehensive KM Strategy by TETFund would help actualise the creation and functionality of this proposed platform.

- Entrepreneur Skills to Drive Research Adoption – Researchers must network and promote their research. TETFund must support HEI in linking its entrepreneurship programmes with local companies through funding and capacity-building mechanisms.
- Awareness about Product/business – Understanding the genuine product, its life cycle, and its contributing environment will lead to increased engagement between researchers and the industry. It will also broaden the perspective of researchers about their work.
- Education – Researchers need to be educated and trained to think beyond the narrow confines of their research outcome as a publication to the real-world application of their research. There is a need to create awareness among researchers about pitching their research in the proper context of application to the industry to make an impact.

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CONCLUSION AND RECOMMENDATION FOR FURTHER RESEARCH

Nigeria is richly endowed with both human and natural resources and has the potential to become a solid and formidable force in the global economy. Yet, it is categorised as one of the poorest developing nations. Wealth creation, employment generation value re-orientation, and poverty reduction goals can be fast-tracked, attained, and sustained through an efficient, relevant, and functional HEI-company linkage. This paper identifies and strategically positions effective connections between HEI and companies as one of the most effective strategies to accelerate Nigeria's economic prosperity. HEI in Nigeria must develop a deliberate research agenda focusing on connecting with the industry to address developmental challenges.

One fundamental question we attempted to answer is why TETFund cannot connect companies with HEI despite its numerous potential and benefits. The paper identified a lack of communication and trust between the HEI and companies as the major bottlenecks. In other words, the HEI and companies seldom 'talk', each facing its direction. This culture of operating in silos by the two institutions needs to change so that a symbiotic relationship will be cultivated for their mutual interests and the development of the country. Nigeria is facing an economic crisis, and as rightly posited by Lesjak et al. (2017), governments cut funding for higher education during a financial crisis. Thus, HEI in Nigeria must secure its funding through collaborations with and marketing its intellectual assets to companies. Presently, the Nigerian government is working assiduously to grant the HEI autonomy, which will pressure the institutions to gain financial independence from the government. To achieve the goal of HEI-company linkage, we advocate for a conscientious intervention by the TETFund to act as a bridge between the two sides. It is advantageously positioned to perform this role under the triple helix model, given its long-standing relationship with both companies and HEI in the country.

For TETFund to effectively perform this proposed intermediation role, exploratory research is recommended to empirically identify the critical barriers to effective collaboration between HEI and companies in Nigeria, which is currently lacking. The proposed study should focus on what must be done to actualise the connections. The study's outcome will then guide TETFund in developing a comprehensive policy to facilitate HEI-company connections for the country's accelerated economic development.

REFERENCES

- Agrawal, A. (2001). 'University-to-industry knowledge transfer: Literature Review and Unanswered Questions'. *International Journal of Management Reviews*, 3, 4, pp. 285– 302.
- Ahmed, F., Fattami, M. T., Ali, S., & Enam, R. N. (2022). Strengthening the Bridge Between Academic and the Industry Through the Academia-Industry Collaboration Plan Design Model. *Frontiers in Psychology*, 13, pp. 1-11.
- Albats, E., Bogers, M., & Podmetina, D. (2020). Companies' human capital for university partnerships: a micro-foundational perspective. *Technological Forecasting and Social Change*, 157, pp. 1-15.
- Ali, T. M., Kiani, A. K., Malik, K., Ramlogan, R. R., & Bashir, T. (2020). Impact of Science Technology and Innovation (STI) on Economic Growth and Development: A Case Study of Pakistan. *Review of Politics and Public Policy in Emerging Economies*, 2(1), pp. 35–54.
- Alkali, U. (2021). 'Development of university-industry interactions for a knowledge-based economy in Nigeria', *International Journal of Technology Management & Sustainable Development, Special Issue: 'Meeting Global Challenges through University-Industry– Community–Government (UICG) Interactions'*, 20:3, pp. 265–84,
- Awasthy, R., Flint, S., Sankaranarayana, R., & Jones, R. L. (2017). "Bridging the Gap—a workshop of industry practitioners and university researchers", in TENCON 2017-2017 IEEE Region 10 Conference, IEEE, pp. 2504-2509.
- Aziz, N., Thang, P. O., & Nikounejad, S. (2021). 'Connecting higher education to Industry: a critical Reflection on Swedish and Iranian HE Policies and Practices' in Nagele, C., Kersh, N., & Stalder, B. E. (Eds.) Trends in Vocational Education and Training Research, vol IV, *Proceedings of the European Conference on Educational Research (ECER), Vocational education and training network (VETNET)*, pp. 26-34.
- Azman, N., Sirat, M., Pang, V., Lai, Y.M., Govindasamy, A. R., & DIN, W. A. (2019). 'Promoting University-Industry Collaboration in Malaysia: stakeholders' Perspectives on Expectations and Impediments' *Journal of Higher Education Policy and Management*;4(11), pp. 86-103.
- Boardman, C., & Bozeman, B. (2015). 'Academic Faculty as Intellectual Property in University-Industry Research Alliances' *Economics of Innovation and New Technology*, 24(5), pp. 403–420.
- Bogoro, S. E. (2018). *Knowledge Economy and our Common Future*. Keynote Address Delivered at the Inaugural Meeting of the Council of the Think Tank of the University of Ibadan Research Foundation, April 18th, 2018.
- Burnside, B., & Witkin, L. (2008). 'Forging successful university-industry collaboration'. *Research Technology Management*, March–April, pp. 26–30.
- Corsi, S., Fu, X., & Kulzer-Sacilotto, C. (2021). 'Boundary spanning roles in Cross-border University-industry collaboration; the Case of Chinese Multinational corporations' *R&D Management*; 51(3), pp. 309-322.
- Etzkowitz, H. (2003). 'Innovation in Innovation: The Triple Helix of University-Industry– Government Relations' *Social Science Information*;42 (3), pp. 293–337.
- Fejoh, J., & Adesanwo, E. (2021). Impact of Tertiary Education Trust Fund (TETFund) Interventions On Industrial Peace In Olabisi Onabanjo University, Ago-Iwoye, Ogun State. *Izvestiya Journal of Varna University of Economics*, 65 (1), pp. 120 - 135.
- Galib, M. A. Munny, K. N., & Khudaykulov, A. (2015). 'Enhancing university-industry collaboration: What are the drivers of academic researchers' involvement in the industry?' *International Journal of Innovation and Economic Development*; I:1, pp. 36- 46.

- Freitas, B. I. M., Geuna, A., & Rossi, F. (2013). 'Finding the Right Partners: Institutional and Personal Modes of Governance of University-Industry Interactions' *Research Policy*; 42(1), pp. 50–62.
- Hafkesbrink, J., & Schroll, M. (2010). 'Organisational Competences for Open Innovation in Small and Medium-sized Enterprises of the Digital Economy' In Hafkesbrink, J., Hoppe, H., & Schlichter, J. (Eds) *Competence Management for Open Innovation*; JEVG: Siegburg, Germany, pp. 21–50.
- Hall, B., Link, A., & Scott, J. (2000). *Universities as Research Partners* Cambridge MA, National Bureau of Economic Research, Working Paper 7643, April.
- Healey, M., Flint, A., & Harrington, K. (2014). *Engagement through Partnership: Students as Partners in Learning and Teaching in Higher Education*. York: HEA.
- Hewitt, B., Walz, D. B., & McLeod, A. (2020). 'The Effect of Conflict and Knowledge Sharing on the Information Technology Project Team Performance'. *International Journal of Knowledge Management*; 16 (1), pp. 1-20.
- Ijigah, E. A., Ojo, O. J., Lawal, A. F., & Nimbe, O. E. (2023). Assessment of Critical Stakeholders Conflict Factors on Tertiary Educational Trust Fund (TETFund) Building Construction Projects in Southwest Nigeria. *European Journal of Theoretical and Applied Sciences*, 1(2), pp. 217-236.
- Jacob, M. (2006). Utilisation of Social Science knowledge in Science Policy: System of Innovation, Triple Helix and VINNOVA' *Social Science Information*, 45 (3), pp. 431– 462.
- Kim, H. (2019). 'Industry Analyses on the Research & Development Expenditures for Korean Chaebol Firms' *Journal of the Korea Academia-Industrial Cooperation Society*, 20(6), pp. 379–389.
- Landes, D. (1980). "The Creation of Knowledge and Technique: Today's Task and Yesterday's Experience" *Daedalus*, 109(1), pp. 11-120.
- Lee, Y.S. (2000). The Sustainability of University-Industry Research Collaboration: An Empirical Assessment. *The Journal of Technology Transfer*, 25, pp. 111–133.
- Lesjak, D., Skrbinjek, V., & Sustersic, J. (2017). 'Higher Education in the Grip of Economic Crisis' in Lesjak, D (Ed) *Effects of Economic Crisis on Higher Education Funding*; Lublin: ToKnow Press, pp. 7-18.
- Lukac, D., & Chatzimichailidou, M. M. (2017). 'Commonsense Approach as a Basis for Successful University-Industry Cooperation' *ACTA Technica CorvinieNSiS*, 1, January-March University Politehnica Timisoara, pp. 91-96,
- Macey, P. M., Woo, M. A., Kumar, R., Cross, R. L., & Harper, R. M. (2010). Relationship Between Obstructive Sleep Apnea Severity and Sleep, Depression, and Anxiety Symptoms in newly-diagnosed Patients. *PLoS One*, 5(4), e10211.
- Marotta, D., Mark, M., Blom, A., & Thorn, K. (2007). *Human Capital and University- Industry Linkages' Role in Fostering Firm Innovation: An Empirical Study of Chile and Colombia*. Policy Research Working Papers No. 4443, World Bank.
- Matyushok, V. M., Baranova, N. M., & Sorokin, L. V. (2020). 'Human Capital Impact for Sustainable Economic Growth' in Sahdev, S., Singh, r. B., & Kumar, M. (eds). *Geocology of Landscape Dynamics*; Springer: Singapore, pp. 21–36.
- Mukhtar, M. M., Abdussalam, D., & Mustapha, m. M. (2021). Factors Affecting Time Performance of Tertiary Education Trust Fund Construction Projects in North-east, *Nigeria Arid Zone Journal of Engineering, Technology & Environment*, 17(3), pp. 335- 346.
- Nishimura, J. & Okamuro, H. (2010). R&D Productivity and the organisation of cluster policy: an empirical evaluation of the industrial cluster project in Japan. DRUID Working Papers 10–06, DRUID, Copenhagen Business School, Department of Industrial Economics and Strategy/Aalborg University, Department of Business Studies

- O'Dwyer, M., Filieri, R., & O'Malley, L. (2022). "Establishing Successful University-Industry Collaborations: Barriers and Enablers Deconstructed" *The Journal of Technology Transfer*, 48, pp. 6-7.
- Perkmann, M., & Walsh, K. (2007). "University-industry relationships and open innovation: Towards a Research Agenda," *International Journal of Management Review*, 9 (4), pp. 259–280.
- Perkmann, M., Tartari, V., McKelvey, M, Autio, E., Broström, A., D'Este, P., Fini, R., Geuna, A., Grimaldi, R., Hughes, A., Krabel, S., Kitson, S., Llerena, P., Lissoni, F., & Salter Sobrero, M. (2013). "Academic engagement and commercialisation: A Review of the Literature on University-Industry Relations," *Research Policy*; 42:2, pp. 423–442.
- Plewa, C. & Quester, P. (2006). 'Satisfaction with university-industry relationships: the impact of commitment, trust, and championship' *International Journal of Technology Transfer and Commercialisation*, 5(1-2), pp. 79-101.
- Pudjiarti, E. S., Lisdiyono, E., & Werdiningsih, R. (2022). 'Knowledge Management to Develop Comprehensive Networking of University-Industry Collaboration in Technology and Innovation Performance' *International Journal of Data and Network Science*; 6, pp. 461-468.
- Rybnicek, R., & Königsgruber, R. (2019). 'What Makes Industry-University Collaboration Succeed? A Systematic Review of the Literature. *Journal of Business Economics*, 89, pp. 221–250.
- Rossi, F., DeSilva, M., Baines, N., & Rosli, A. (2022). 'long-Term innovation Outcomes of University-industry Collaborations: the role 'bridging' vs 'blurring' boundary-spanning Practices' *British Journal of Management*, 33, pp 478-501.
- Siegel, D., Waldman, D., Atwater, L., & Link, A. (2003). 'Commercial Knowledge Transfer from Universities to Firms: Improving the Effectiveness of University-Industry Collaboration' *The Journal of High Technology Management Research*, 14, pp. 111– 133.
- Sun, J., & Turner, H. (2022). "The Complementarity Investment in University-Industry Collaboration" *Innovative Higher Education*, 48 (1), pp. 900–931.
- Suparno, H., & Ekopriyono, A. (2022). 'What Drives University-Industry Collaboration' *International Journal of Scientific and Research Publications*; 12(1), pp. 179-185.
- Tertiary Education Trust Fund (2021). TETFund 2021 Annual Report https://tetfund.gov.ng/wp-content/uploads/2024/04/TETFund-2021-Annual-Report_compressed.pdf. Accessed 11th May, 2024.
- Tertiary Education Trust Fund (2023). Research and Development/Centres of Excellence Departmental Report to TETFund Management Retreat held in Makurdi, December 2023.
- Tertiary Education Trust Fund (2024). Welcome Address by the Executive Secretary, Tertiary Education Trust Fund Arc. Sonny S.T. Echono at the Annual Strategic Planning Meeting with TETFund Beneficiary Institutions at the TETFund Auditorium on Friday 12th January 2024. https://tetfund.gov.ng/wp-content/uploads/2024/01/ES_speech-12th-January-2024-_corrected.pdf. Accessed 11th May, 2024.
- Thornley, C., Mcloughlin, S., & Shankar, K. (2019). 'Knowledge Management in Academic Industry Collaborations; How to Best Foster Innovation Capability' *Proceedings of the European Conference on Knowledge Management: Academic Press*, pp. 1016-1022.
- Tocan, M. C. (2012). 'Knowledge-based economy assessment', *Journal of Knowledge Management, Economics and Information Technology*, 2: 5, pp. 1–13.
- Veselá, D. & Klimová, K. (2014). 'Knowledge-based Economy vs. Creative Economy' *Procedia - Social and Behavioral Sciences*, 141, pp. 413 – 417.
- World Bank. (2002). World Development Report 2002: Building Institutions for Markets. New York: Oxford University Press.

World Economic Forum. (2018). Global Gender Gap Report Nigeria. Retrieved from <http://reports.weforum.org/global-gender-gap-report-2018/data-explorer/#economy=NGA>

World Intellectual Property Organisation (WIPO). (2023). Global Innovation Index 2023. Retrieved from <https://www.wipo.int/about-wipo/en/offices/nigeria/news/2023/>

Zafar, M. W., Shahbaz, M., Hou, F., & Sinha, A. (2019). 'From non-renewable to renewable energy and its impact on economic growth: the role of research & development expenditures in Asia-Pacific Economic Cooperation countries' *Journal of Cleaner Production*, 212, pp. 1166–1178.