

University Collaborative Research and Wealth Creation

By

Francisca Nonyelum Odigwe

francaodigwe@yahoo.com

Department of Educational Management, University of Calabar, Nigeria

&

Valentine Joseph Owan*

owanvalentine@gmail.com

Department of Educational Foundations, University of Calabar, Nigeria.

Introduction

There are two primary roles of universities – a place of learning and where new ideas and technologies are created. Universities profit from teaching and learning, research, and technology positions. It is the responsibility of institutions of higher learning to produce capable and self-directed learners who are confident and capable of contributing to society through leadership or civic engagement. Universities also prepare students for high-level employment. These institutions are also there to generate new knowledge, shift paradigms, assist society in fulfilling its evolving needs and tackle new problems. Universities have further been tasked with developing highly competent staff and research output to attain their stated objectives.

Additionally, universities may contribute to forming new civil societies and cultural values through the teaching and socialisation of future generations. Since research is fundamental to knowledge creation and problem-solving, universities must engage in activities that strengthen knowledge production. One such strategy at the disposal of the universities for knowledge and wealth creation is collaborative research engagements. This chapter discusses the concept of collaborative research and wealth creation. The chapter also discusses five types of university research collaborations and some models of university research collaboration.

Conceptual clarification

Concept of wealth creation

Wealth creation has different meanings based on the views of the different scholars that have attempted to define it. According to Enderle (2009), "in the capitalistic system, the "acquisitive spirit," "the accumulation of capital," and the "acquisition of companies" do not necessarily entail the creation of wealth, properly speaking" (p.288). The cited scholar instead views wealth creation as a qualitative change in wealth. Ponaka (2022) defines wealth creation as involvement in making investments in various asset types to meet one's long-term financial goals. The author added that such investments should be self-contained to provide an ongoing source of income, allowing one to achieve their goals. It is the practice of investing financial resources to grow one's assets by making prudent financial choices. Enderle (2010) considers wealth creation as an "innovative activity that involves constantly searching for improvement, not only because pushed by competition but for the sake of a better service to people and the environment" (p.2). The process of building wealth is not a one-shot event but rather one that takes place for many years. It is "sustainable," fulfilling the demand "to meet the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development [WCED], 1987, p. 8).

This chapter defines wealth creation as the systematisation of procedures to generate or raise the value of all physical and intangible assets, including welfare, well-being, utility, and pleasure. The focus of wealth creation is not only on accumulating finances or financial assets; it is about making a difference in people's lives by improving material conditions. Wealth creation has financial and welfare components. It also focuses on engagements in private and public projects, where the former aims to derive financial benefits through profits and the latter is concerned with addressing social issues. We often make the fallacy of seeing innovation as a set of manufacturing and distribution processes. Wealth creation is distributive from the preconditions through production to the conclusion, use and allocation for consumption and

investment. Wealth is comprised of physical, financial, human, and social resources. Possessing and amassing riches is not the same as wealth creation. It entails improving things; it is intergenerationally sustainable in terms of human capabilities. There is a link between the productive and distribution elements of wealth creation (Enderle, 2010). Wealth creation is a worthwhile endeavour since it encompasses material and spiritual elements.

Concept of collaborative research

It is essential to define the term 'research collaboration' to understand the meaning of collaborative research. 'Research collaboration' might be described as researchers cooperating to further scientific understanding (Katz & Martin, 1997). However, this raises the issue of how closely researchers must work together to qualify as a 'collaboration' (Subramanyam, 1983). Bozeman et al. (2013) see collaboration as a "social process whereby human beings pool their human capital for the objective of producing knowledge" (p.3). By this definition, they argued that collaborative research partnerships do not have to be concerned with mere publishing articles; in fact, collaborations are frequently more concerned with creating technology, software, or patents and may sometimes never lead to any publication. Large teams of experts collaborate on research and publications, although some collaborators never meet or even communicate with one other in some circumstances. The fact that skills are brought together to generate new information still strikes as a collaborative effort and generally results in a recognisable knowledge output (e.g., scientific paper, patent).

If taken to its logical conclusion, the worldwide research community is one enormous collaborative effort in which every researcher contributes to advancing scientific knowledge. Each other's thoughts and ideas on upcoming experiments and hypotheses to test are exchanged, as is information on new instruments to develop and the best ways to link experimental data to theoretical models. Research team members will consult with others for assistance and advice while doing these and other activities (Ameh et al., 2021). Therefore, collaborative research involves two or more researchers or institutions uniting efforts primarily to address common or unique problems. Any research that arises out of the declared needs, interests and queries of stakeholders involved in the study and its conclusions is collaborative (Pushor, 2008).

Many of today's most pressing scientific and technological problems may be resolved by bringing together interdisciplinary teams of experts (Bansal et al., 2019). Collaborative research brings academics and practitioners, policymakers and other stakeholders together to undertake a collaborative study in which everyone stands to gain. Collaborative research can lead to the exchange of ideas across disciplines, development of new skills, access to financial resources, production of better findings, and provision of personal rewards like pleasure and enjoyment. Collaborative research may occur within a field or between disciplines when diverse voices and perspectives are brought together in multidisciplinary or intersectoral teams to examine a research issue more comprehensively, holistically or interactively. In the context of a university-community partnership, collaborative research might investigate a problem that the community is grappling with, with the assistance and resources provided by academics from the institution.

A feeling of mutuality and similar aims is essential to collaborative research, where each partner can learn from the other, and the study outcomes become mutually beneficial (Pushor, 2008). When two people, groups, or institutions collaborate, they will be able to achieve better research results than they could on their own. This is because collaborative research encourages a rich exchange of ideas between and among persons and the many viewpoints they embody. Rather than seeing research as an authoritative source for practice, social scientists are increasingly turning to collaborative methods to help them enjoy the mutually reinforcing nature of research and practice. A study's philosophical, ideological and ethical underpinnings and how they are reflected in its design, instruments, data collection and analytical methods, and dissemination are the subjects of collaborative research.

University collaborative research

University collaborative research refers to all research engagements and linkages among universities or involving universities with other sectors of the economy. It is initiations or agreements between two or more universities or between a university and other institutions/organisations striving to achieve specified aims. Although universities are collaborating, a group of researchers (individuals) from different institutions are often actively engaged. Depending on the nature of the research, a department or faculty of a university may represent the institution. University collaborative research has the same aims as collaborative research

in general. Universities or other large institutions provide research groups and a broader range of specialities to other institutions collaborating with them (Abramo et al., 2011). Cooperation between private businesses and governmental research institutes has been a top focus for industrialised countries (OECD, 2007).

In the ideas of many academics, university collaborative research entails becoming co-authors on a publication from different universities. As a result of this, and partly because of how easily co-authorship can be quantified, most published studies on research collaboration focus on co-authorship. According to Katz and Martin (1997), in one of the most comprehensive analyses of research collaboration, the co-author concept offers several advantages, including verifiability, long-term stability, data availability, and ease of measurement. However, it provides a shallow insight into how much each participating university (represented by their researchers) contributed to the output. There are several reasons why university research collaborations might fail, including exhaustion of resources, the decision to focus on a more viable project, or the inability to work together.

Forms of university research collaboration

a. Intra-university research collaboration

This is a form of collaboration where teams of researchers from the same or different fields within the same university work harmoniously towards achieving a common goal. In this form, a research project involves collaborating members from two or more separate research groups inside the same university. There is no external financing, and the work is evenly split between the groups. All the participants meet periodically to discuss their work and arrange for the publication of their findings. Intra-university collaboration can occur among faculty, between staff, and administrators, within/between departments, faculty and students, or among students.

Among faculty, a researcher may opt to enlist the help of peers with comparable research interests, appropriate knowledge, and a proven record of accomplishment from his university to collaborate on new initiatives or engage in an ongoing project. Within/between departments, there is a common belief that colleagues in the same department or discipline are aware of the most pressing challenges in their respective fields. Theoretical, methodological, and nomenclatural similarities may exist even among people with wildly divergent areas of expertise. However, collaboration may also be fostered within departments and beyond academic fields. Projects with a multidisciplinary focus, leveraging complementing fields to generate novel solutions to unresolved challenges, are most likely to benefit from this kind of collaboration.

Faculty and students can collaborate on research projects in various contexts, either as assignments for research methodology courses, a mentoring relationship, a collaborative effort with academic institutions, government/quasi-governmental units, or private industry concerns. Students obtain a better understanding of how research is performed in a rather than simulated context. However, they can also witness how research is applied to real-world situations and the findings of either successful or failed investigations. Faculty evaluation and criticism of student performance may also be beneficial to students. As a result, students' ability to collaborate on research projects may improve.

Students with similar research expertise and status (considered peers) or between a more experienced researcher (senior) and a less experienced researcher (junior) may collaborate on study design, execution, evaluation, analysis, and reporting, among other activities. These activities are designed mainly to help them practise and improve their research abilities, not necessarily to do original research and begin writing a paper. Along with research experience, students may appreciate teamwork, responsibility, and accountability through engaging in research projects (Shamoo & Resnik, 2003).

b. Inter-university research collaboration

This is a form of collaboration involving researchers of the same or different departments across two or more universities. Scholars from many universities may collaborate on a research project at times. Most of the time, researchers will be working on different aspects of the same research, collecting and exchanging data, and doing collaborative data analysis for the whole project. University-industry collaborations on research are essential to both organisations' long-term success. Academics' stature rises because of external research funding, while firms depend on university academics for new product ideas. Funding for research is essential to sustaining faculty output in the same way that the industry relies on new ideas for profit.

Other benefits of inter-university research collaboration include obtaining necessary resources, such as databases, equipment, personnel, and study populations, establishing credibility by recognising prominent

researchers or departments, and interacting with researchers with expertise in the proposed area. Additionally, it is common for one institution to share resources with another and vice versa. Researchers working with teams from various universities often try to avoid intellectual inbreeding. As a result of gaining knowledge from one, another's distinct study experiences, a more substantial proposal may be prepared. Working together with teams from other universities allows one to build a more comprehensive network of research connections.

c. *University-government research collaboration*

Universities and government have long collaborated in public policy, health and educational reforms. University-government collaborative research can be initiated through government agencies (at different levels) seeking university specialists to help solve issues; government agencies providing funds for specific themes; university researchers contact the government to request collaboration in a research endeavour. Academic and government collaborations should be mutually advantageous for both sides, as with other forms of collaboration. Education, nursing, pharmacy, and public health are just a few disciplines that can link up with various government ministries, divisions, and units (such as state and the local education authority, health departments, and development programmes).

d. *University-industry research collaboration*

Collaborations between universities and industry may assist enterprises in advancing their research and development (R&D) efforts. Industry scientists work with university academics to discover current research priorities that might be useful in designing and developing new processes and products. University and industry can collaborate for many reasons. These include increased emphasis on corporate-sponsored university research; academic staff consulting; licencing of university-owned patents to existing firms; university support for beginning firms in terms of loans, grants, and shareholding; massive contracts between independent companies and universities that cover a wide range of relationships; research centres and other government-supported attempts to stimulate university-industry synergy.

e. *University-industry-government research collaboration: The triple helix*

The university-industry-government (UIG) collaboration is a tripartite link highlighting how three institutions work harmoniously in research and development initiatives for the good of all parties and socioeconomic development. This creates the triple helix (TH) model explaining how UIG work together to spur economic development and innovation. Under the TH framework, research is the primary means universities should develop and disseminate new information and supplement conventional roles such as teaching and community services. Unlike academics and research organisations, the industry is tasked with generating income by commercialising ideas developed by universities and transforming them into new products and services. The government spearheads proactive research and innovation financing policies, which serve an oversight and supporting role. Mechanisms and incentives need to be in place to encourage productive research collaboration.

Characteristics of collaborative research

The following are characteristics of collaborative research:

1. It is an atmosphere of mutual respect and support that stems from a moral and ethical commitment to each other and the research goal.
2. Collaborators have a strong feeling of interdependence, shared accountability, and mutual respect for one another's work.
3. The leader in collaborative research is responsible for overseeing all aspects of the research endeavour (such as planning, coordinating the team, assigning duties, deciding workload, setting timelines and so on).
4. Team behaviour is governed by established principles, cultural values, and conflict management techniques.
5. Everyone in the team is united in supporting the research methods and goals.
6. The complementarity of the engagement is founded on equity rather than equality.
7. Research participants have varying levels of involvement or interest in various areas of the project.

8. Co-researchers may work on particular project areas jointly, but a division of labour can be used for other parts.
9. As the study progresses, research plans are adjusted, and functions are renegotiated, allowing for more engagement from all research team members.
10. Participants are involved in all phases of the research, from conceptualising and formulating research questions/hypotheses to collecting and analysing the information to disseminating the results.

Benefits of research collaboration

The following are some benefits of research collaboration:

1. It helps in tackling complex problems beyond the ability of one person or institution.
2. It allows for sharing technology, knowledge, skills, and other resources.
3. It paves the way to transfer tacit knowledge, creating a sense of teamwork and friendly ties.
4. While collaborating, divergent viewpoints can collide, resulting in discoveries and views that would not have been conceivable if each person/institution worked alone.
5. Collaborating with others in the scientific community may help researchers and institutions build a more extensive network of contacts.
6. Collaboration also promotes access to funding opportunities.
7. Scientific discoveries and breakthroughs into highly regarded publication venues are more likely to occur when researchers/institutions work together.
8. Collaboration makes completing the research process faster.
9. Collaboration has the potential to raise the visibility of the work and, therefore, increase the number of citations.

University collaborative research and wealth creation

Over time, universities in Nigeria have had to battle with the problem of underfunding, poor supply of facilities/infrastructure and limited research grant opportunities, among others. As knowledge producers, it is unarguable that universities can create wealth for self-sustenance and national advancement. However, over the last three decades, only a handful of universities in Nigeria have demonstrated the capacity to be self-sustainable. As a nation, Nigeria is still struggling with developmental problems, suffering balance of payment deficits, unemployment, hunger, inflation, and low GDP, among other macroeconomic issues. Consequently, the country relies on heavy importation of consumer goods against strengthening productive capacity to create a surplus for consumption and exports. One of the reasons for the perceived backwardness in Nigeria's domestic productivity is the abnegation of the university-industry collaboration. How can our industries function effectively without using the correct information from universities? How can universities produce quality research for problem-solving without funds and without understanding the challenges faced by the industry? Above all, how can the nation or economy be productive if industry or government does not implement university research results?

To create wealth at the institutional and national levels, universities, industries, and government must strengthen their linkages. Through collaboration, universities can access funds from the government and industry for research purposes. These research engagements are multi-sectoral because industries across different sectors partner with relevant departments in universities to carry out scientific investigations. For example, manufacturing, agricultural, food processing, petroleum, textile and mining industries could link up with engineering, physical sciences, agricultural science, etc. Researchers in these fields utilised the funds provided in conducting research, with the results kept either as tacit or explicit knowledge. When kept tacitly, the results are only communicated between the researchers, institutions and the funding agency/industry. The industry uses this knowledge to produce primary, secondary or tertiary products (consumer goods or export commodities). Keeping the knowledge tacitly ensures that no one else understands the technology behind the product(s), making the firm enjoy some form of monopoly. The knowledge produced may also be made explicitly available through patenting. By patenting, the universities where the knowledge was created may allow public use but gain financial returns through royalties for as long as the knowledge is used.

University-industry-government collaborative research has a three-way benefit because it can promote export and attract foreign earnings. To use the expertise and research infrastructure available through industry-university collaborations, corporations may tap into university-based people resources with

advanced degrees to access new technologies and information (Ankrah & Al-Tabba, 2015; Rybnicek & Königsgruber, 2019). With more government financing and access to industrial equipment, universities can educate students on practical skills relevant to the industry and provide current infrastructure requirements to enhance teaching and research (Akinmade & Alao, 2020). This is a solution where everyone benefits, both students and universities. In many countries, research and development grants from international organisations and corporate firms are a "major source" of university financing, making collaboration with industry and government an inescapable aspect of university finance (OECD, 2015). This can, in turn, improve the balance of payment position of the country.

Through patents, universities can earn lifetime royalties over some discoveries with wide usability and value. Going by the definition of wealth (earlier discussed), university collaborative research provides rewards beyond financial accumulation to value creation and welfare. Welfare is created because scientists with access to research funding are more likely to live happily. The nation at large gains international recognition and competes in the international market through its domestic production. Prices of consumer goods become cheaper and affordable in local markets, and employment increases (due to the need for more workers by industries). On the other hand, Industries enjoy profitability, and the nation enjoys a balance of payment surplus (since other nations will have to pay custom excise, import duties and ad valorem tax to import Nigerian made resources), among other welfare benefits. For example, even though tomatoes cannot naturally grow in Holland, the nation has become a significant exporter of the commodity (Leydesdorff, 2012). Anything in a knowledge-based ecosystem must be dismantled logically, developed correctly, and reassembled ingeniously to be valid.

Challenges affecting university collaborative research in Nigeria

1. A lack of profound camaraderie based on morality and ethics can lead to some researchers challenging other team members' views, thinking, or interpretations.
2. Much time can be spent at the outset of a project getting to know team members leading to delays; time is an investment in the research process.
3. Collaborations between researchers from different institutions may be challenging due to distance, cultural factors, and individual differences, which might stymie communication and project management.
4. Difficulty in universities finding the right partner has limited their linkages with the industrial sector for collaborative research engagements.
5. Issues of copyright ownership have also hindered some universities from inter-collaborating with other universities.
6. It is complicated to develop a trustful and respectful relationship with co-researchers in any collaborative research endeavours since it requires patience, interaction, space, and cooperation. Not all team members will possess all these attributes.
7. Lack of political commitment from government officials to link their parastatals with universities and industries for research collaboration.
8. Poor awareness among industry players on the benefits of collaborating with universities for research and development initiatives is another challenge.
9. Poor public acceptance of locally produced goods, solutions and technology ("made in Nigeria" syndrome) have made most industries that would have collaborated with universities for production cease operation.
10. The "publish or perish" situation in universities has led to massive production of poor research by universities that are unexciting, unappealing and uninviting to industrial and government sectors.
11. The non-availability of research-based universities and postdoctoral fellowship opportunities in Nigeria has led to the breeding of doctoral students with poor research thinking and skills, weakening the nation's research capacity.
12. The relational character of collaborative research is one of its greatest strengths, but it is also one of its biggest problems.
13. The workload assigned to academic staff for teaching and community services by universities is often too heavy and overwhelming, leaving very little or no time for research ventures.

14. There will always be conflicts when two or more people are working together. Poor conflict management has hindered many teams from collaborating successfully, especially when norms and procedures are not established upfront.

Ways to improve university research collaboration culture in Nigeria

The following recommendations are made to improve university research collaboration

1. A legal mechanism must be formed for any collaborative research partnership.
2. Academic institutions should examine their policies on technology transfer and the protection of intellectual property (IP). These rules should create a common framework that all parties can enforce.
3. Collaborations can only succeed if they are based on trust, shared duties, shared understanding, dissemination of information and opportunity.
4. Universities should prioritise investment in graduate and postdoctoral students since they possess the necessary abilities and are more receptive to non-traditional academic career paths than typical academic employment alternatives.
5. Relationships and organisational commitment are prerequisites for university-industry-government collaborations. Measures concentrating on border bridging and fluidity should be used to develop collaborations.
6. Research-based universities should be established across different regions of the country to strengthen the research capacity of universities and the nation.
7. Seasoned and well-established academics should engage in mentorship programmes to develop students' minds (right from the undergraduate level) towards following a research career path.
8. The commercialisation of research findings necessitates a more active role for institutions. Therefore, universities must show the relevance of their study to the industry and government in a relevant setting and promote their findings.
9. To address the underrepresentation of university research, institutions must provide a medium through which individuals may connect with meaningful links to share research ideas and accomplishments.
10. Training and education are required to assist researchers in putting their findings into a larger perspective, extending beyond the confines of a journal article to one that communicates results in an industry-relevant manner to make an impact.
11. Universities should float postdoctoral fellowships to offer PhD holders the opportunities to practice research and further strengthen their research skills.
12. Universities need to train academically prepared employees who can communicate effectively with business and marketing professionals.
13. Universities should contact alumni and communicate with them about institutional growth. Effective and sustained partnerships with graduates may enhance industry participation, research funding, charitable giving, and a broader social effect.

Conclusion

Collaboration among researchers and universities is critical in tackling complex problems, especially those involving interdisciplinary teams. Through university-industry-government partnerships, universities can contribute more to the nation's rapid economic development through wealth creation. This wealth, which can be quantified in monetary and welfare terms, is beneficial to all the parties in collaborative research. At the institutional level, this chapter concludes that university collaborative research is a crucial practice for boosting national and global recognition, amongst other benefits.

References

- Abramo, G., D'Angelo, C. A., & Di Costa, F. (2011). University-industry research collaboration: a model to assess university capability. *Higher Education*, 62(2), 163-181. <https://doi.org/10.1007/s10734-010-9372-0>
- Akinmade, D. O., & Alao, D. O. (2020). Industry-universities collaborations and the challenges of human capital development in Nigeria. *Research Journal of Humanities, Legal Studies & International Development*, 4(1), 189-199.

- Ameh, E., Owan, V. J., & Anam, E. G. (2021). Career empowerment variables and academic staff research productivity in a public university: Does collaboration and institutional culture mediate the nexus?. Research Square Pre-print. <https://doi.org/10.21203/rs.3.rs-978602/v1>
- Ankrah, S., & AL-Tabbaa, O. (2015). Universities-industry collaborations: A systematic review. *Scand J Manag* 31, 387-408. <https://doi.org/10.1016/j.scaman.2015.02.003>
- Bansal, S., Mahendiratta, S., Kumar, S., Sarma, P., Prakash, A., & Medhi, B. (2019). Collaborative research in the modern era: Need and challenges. *Indian Journal of Pharmacology*, 51(3), 137–139. https://doi.org/10.4103/ijp.IJP_394_19
- Bozeman, B., Fay, D., & Slade, C. P. (2013). Research collaboration in universities and academic entrepreneurship: the-state-of-the-art. *The Journal of Technology Transfer*, 38(1), 1-67. <https://doi.org/10.1007/s10961-012-9281-8>
- Enderle, G. (2009). A Rich Concept of Wealth Creation Beyond Profit Maximization and Adding Value. *Journal of Business Ethics*, 84(3), Article 281. <https://doi.org/10.1007/s10551-009-0205-y>
- Enderle, G. (2010). Wealth creation in China and some lessons for development ethics. *Journal of Business Ethics*, 96(1), 1–15. <https://doi.org/10.1007/s10551-010-0453-x>
- Katz, J. S., & Martin, B. R. (1997). *What is research collaboration?* *Research Policy*, 26(1), 1–18. [https://doi.org/10.1016/S0048-7333\(96\)00917-1](https://doi.org/10.1016/S0048-7333(96)00917-1)
- Leydesdorff, L. (2012). The triple helix, quadruple helix, ..., and an n-tuple of helices: explanatory models for analysing the knowledge-based economy? *Journal of the Knowledge Economy*, 3(1), 25–35. <https://doi.org/10.1007/S13132-011-0049-4>
- OECD (2007). OECD science, technology, and industry scoreboard: Benchmarking knowledge-based economics. OECD
- OECD (2015). *OECD Science, technology and industry scoreboard 2015: Innovation for growth and society*. OECD. https://doi.org/10.1787/sti_scoreboard-2015-en
- Ponaka, S. (2022). Wealth creation - Meaning, importance and investment plans. (Internet Source). Scripbox. <https://scripbox.com/pf/wealth-creation/>
- Pushor, D. (2008). Collaborative research. In L. M. Given (Ed), *The SAGE encyclopedia of qualitative research methods* (pp. 91-94). Sage publication. <https://doi.org/10.4135/9781412963909.n51>
- Rybnicek, R., & Königsgruber, R. (2019). What makes industry-university collaboration succeed? A systematic review of the literature. *Journal of business economics*, 89(2), 221-250. <https://doi.org/10.1007/s11573-018-0916-6>
- Shamoo, A. E., & Resnik, D. B. (2003). *Responsible conduct of research*. Oxford University Press Inc.
- Subramanyam, K. (1983). Bibliometric studies of research collaboration: A review. *Journal of information science*, 6(1), 33-38. <https://doi.org/10.1177/016555158300600105>
- World Commission on Environment, Development (WCED). (1987). *Our common future*. Oxford University Press.