THE WEST AND THE POLITICS OF TECHNOLOGY TRANSFER TO DEVELOPING STATES: THE NIGERIA EXPERIENCE, 2015–2025

BY

JESSICA ONYINYECHI
GOU/U22/IRE/573

DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS
FACULTY OF MANAGEMENT AND SOCIAL SCIENCES, GODFREY OKOYE UNIVERSITY, ENUGU STATE

JULY, 2026

THE WEST AND THE POLITICS OF TECHNOLOGY TRANSFER TO DEVELOPING STATES: THE NIGERIA EXPERIENCE, 2015–2025

BY

JESSICA ONYINYECHI
GOU/U22/IRE/573

A PROJECT PRESENTED TO THE DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS, FACULTY OF MANAGEMENT AND SOCIAL SCIENCES, GODFREY OKOYE UNIVERSITY THINKERS CORNER ENUGU, NIGERIA

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF BARCHELOR DEGREE IN POLITICAL SCIENCE

SUPERVISOR: DR. IFEDI

JULY, 2026

APPROVAL

This project has been examined and approved by the department of political science Godfrey Okoye University for the award of Bachelor of Science (B.Sc) in political science.

Dr. Ifedi Francisca **Date**
Supervisor

Prof. Sam Ugwuozor **Date**
Head of Department

Prof. John Odoh **Date**
Dean, Faculty of Management and Social Sciences

External Examiner **Date**

CERTIFICATION

I, **Jessica Onyinyechi** an undergraduate student in the department of Political Science and International Relations, Faculty of Management and Social Sciences in Godfrey Okoye University with the registration number **GOU/U22/IRE/573**, do certify that, to the best of my knowledge, this research is original and never have been submitted for any diploma or degree at Godfrey Okoye University or any other university.

_____ _____

Jessica Onyinyechi **Date**

DEDICATION

To God, who made this work possible, thank you for Your wisdom, strength, favour, presence and endless love.

ACKNOWLEDGEMENTS

First and foremost, I give all glory and thanks to Almighty God for granting me the strength, wisdom, and perseverance to successfully complete this research project. Without His divine guidance, this work would not have been possible.

I sincerely acknowledge my supervisor, Dr. Mrs. Ifedi Francisca, for her expert guidance, mentorship, patience, and continuous support throughout the development of this work.

I am also deeply grateful to the Dean of Management and Social Sciences, Prof. John Odo, for his leadership and academic support.

My heartfelt appreciation also goes to my able Head of Department, Prof. Samuel Ugwuozor, for his guidance and encouragement throughout my academic journey.

I extend my gratitude to my esteemed lecturers in the Department of Political Science and International Relations: Prof. Ocheoha Onyema (mni), Dr. Sr. Lucy Umeh, Dr. Kingsley Ezechi, Mr. Onyishi A.U, Mr. Okonkwo W.O, Mr. Nweke C., Dr. Onwo N.C, Dr. Mbaeze, and Rev. Fr. Ikenna Ugboka and my secretary Mrs Chioma Obidike, for the knowledge, inspiration, and academic support they have imparted.

I also sincerely appreciate our departmental secretary, Mrs. Chioma, for her assistance and support throughout my studies.

I am deeply grateful to my amazing parents, Mr. Francis Ogechukwu Umeh and Mrs. Chinwe Grace Umeh, and my siblings, Maureen Victor and Francis Umeh, for their love, sacrifices, encouragement, and support that made this success possible.

I also extend appreciation to my wider family, including my dearest uncle Mr. Chimaobi Kelvin Umeabiam, Mr. Martins Ukoh, and my lovely Onyeisi Mrs. Bibian Ebele Ekwenugo, whose motivation and inspiration sustained me throughout this journey.

To my amazing siblings, Maureen Victor and Kamsi, I sincerely appreciate your advice and encouragement.

To my very best friend, Victor Onigah, I deeply appreciate your love, support, and encouragement. I am truly blessed to have you in my life.

Finally, to my friends — Felix, Joshua, Tosin, Daniella, Ehiz, and my munchkin Chide — thank you all for your love and support. I appreciate you all sincerely.

Thank you.

TABLE OF CONTENT

LIST OF TABLES

ABSTRACT

This study involves The West and the Politics of Technology Transfer to Developing States: The Nigeria Experience, 2015-2025, and how the transfer of Western technology and brain drain have affected industrial and technological development of Nigeria. The study is based on Dependency Theory, that explains the structural inequalities in the exchange of technologies in the world and how this affects the development of their economies. The approach of the research is qualitative and secondary data are obtained from policy documents, international organization reports and scientific literature. The study employs thematic content analysis with the two main dimensions being the influence of Western technology transfer policies on industrial development in Nigeria and the influence of brain drain of technological experts on Nigeria technological capacity. The results show that between 2015 and 2025, Nigeria's industrial development is highly reliant on foreign technologies, as a result of weak IP regimes, technology licensing restrictions and the dominance of multinationals in key industries like oil and gas, telecom and ICT, and manufacturing. Technological inflows facilitated a small growth in industry, as well as structural dependency and limited indigenous innovation. Also, the ongoing brain drain of highly trained personnel in Nigeria had the effect of significantly lowering the country's research and development capabilities, its innovation production and the capacity to absorb and adapt foreign technological inputs effectively. The study suggests that the combination of Western technology transfer policies and brain drain help reinforce Nigeria's technological dependency, thus constricting sustainable industrial development. It calls for the revision of technology transfer transactions to focus on local capacity-building, knowledge sharing, and innovation, along with better policies encouraging the retention of talent and improving domestic innovation and research and development infrastructure.

CHAPTER ONE

INTRODUCTION

1.1. Background to the Study

Technology is one of the most important forces that affect the industrial and economic path of states. It enables efficiency in production and lays the foundation for innovation, competitiveness, and socio-economic transformation. Transfer of technology between advanced and less developed economies has been viewed as one of the critical avenues of reducing development gaps. It involves the transfer of knowledge, skills, organizational practices, and innovations from one nation to another with the hope of complementing industrial capacities.

The history of technology transfer in the world is asymmetrical between the developed industrialized nations, most of which are found in the West, and the developing global south. Western countries such as the United States, the United Kingdom, and Germany have historically dominated technological innovations. They usually ensure that technology flows in ways that favor their economic and strategic advantage through mechanisms like intellectual property rights, licensing, and multinational operations. Consequently, technology transfer is rarely on terms that allow developing states to domesticate, adapt, or replicate it for sustainable industrialization. Instead, it often serves as a means of dependency, reducing developing nations to technology consumers rather than producers.

In Africa, such issues are especially urgent. Despite years of developmental aid and foreign investment, technological backwardness, weak innovation systems, poor investment in research and development (R&D), and inadequate infrastructure remain major obstacles. Most African countries are dependent on the imported equipment and computer technologies which frequently cannot be adapted to local requirements. This dependency leads to them being dependent as the multinational corporations tend to sell modern technologies, keeping the

patents, process, and expertise, which restricts the dissemination of knowledge to the host nations.

A good example is given by Nigeria, the biggest economy in Africa. Since gaining independence in 1960, Nigeria has been engaging in industrialization initiative, but it is still too much reliant on imported technology. The vast majority of the industrial base, including petroleum exploration, digital platforms, etc., depends on the imports of the West. This reliance has created structural vulnerability, in the sense that, the key technologies are dominated by foreign firms. In addition, Nigeria does not spend a lot on R&D, fails to fund innovation efficiently and does not possess strong policies to spur development of local technologies.

Technology development in Nigeria dates back to the industrialization process post-independence where the government set up research institutes and invested in higher education to create capacity. Nevertheless, the level of technological development in the country is rather low in terms of international standards. Nigeria has failed to breakthrough to compete with the modern technological giants, the differences between the imported and indigenous technologies are huge. This disparity highlights the fact that the policy frameworks, domestic innovation, and retention of skilled professionals to lead technological self-reliance must be improved urgently.

Nigeria has taken steps to promote innovation and technological development by implementing policies including the National Science, Technology and Innovation Roadmap (20172030) and the National Digital Economy Policy and Strategy (20202030). These programs increased the participation of the country in the activities of international technology firms such as Microsoft, Google, and IBM that offered infrastructure and training. Critics however claim that such alliances are mainly in support of the commercial interests of foreign companies and not in line with the long-term industrialization objectives of Nigeria.

The other difficulty has been brain drain- the high influx of skilled workers like engineers, scientists and ICTs to developed nations in pursuit of improved opportunities. This exodus reached a higher point between the year 2015 and 2025. Despite the fact that Nigeria is generating highly qualified workers, especially in its nascent ICT sector (also known as the Silicon Lagoon), most of them moved to the United States, the United Kingdom, and Canada where they have superior innovation ecosystems. In this way, Nigeria was able to open up to foreign technologies but missed out on most of the human capital necessary to adopt and replicate them.

Western technology transfer politics in Nigeria in the year 2015 to 2025 hence pose a structural dilemma. On the one hand, there have been inflows of technology that have resulted in digital expansion, telecommunication expansion, and new industries. Conversely, the intellectual property systems have been restrictive, the dominance of multinationals as well as brain drain have hampered the ability of Nigeria to establish self reliance. Such dynamics have also enhanced dependency rather than encouraging the indigenous innovation.

This paper thus asks, how western policies on technology transfer has affected industrial development in Nigeria between 2015 and 2025 and whether brain drain has continued to frustrate the capacity of the country to attain sustainable technological development.

1.2. Statement of the Problem

Industrial and technological advancement is still at the heart of developmental aspirations among modern states. In the case of developing nations such as Nigeria, the transfer of technology by the developed economies has been suggested as one way of addressing the gap in innovation and increasing industrial capacities. Nonetheless, it is a political process which is influenced by power asymmetries and which is driven by self-interest of the donor states and multinational firms. Although inflows of technology show a short term benefit, they also create

structural dependency, curbing the freedom of recipient countries to map out their own industrial destiny.

This paradox is reflected in the experience of Nigeria throughout 2015 to 2025. The Federal Government introduced the National Science, Technology and Innovation Roadmap (20172030) and National Digital Economy Policy and Strategy (20202030) as a means of self-reliance. However, the industrial sector in the country is still too reliant on the Western technologies, such as oil exploration tools or the digital communications networks. Such transfers are consolidated within constraining intellectual property regimes, and corporate monopolies which ensure Nigeria cannot localize and replicate technologies to achieve sustainable development.

To top it all is brain drain. Nigeria has continuously been losing its skilled minds-engineers, IT experts and scientists-to the western countries in search of a better opportunity. This loss erodes the competence that is required to localize imported technologies and develop local innovations.

This problem has been studied by a number of scholars. As an example, Dahlman (2018) and UNCTAD (2020) have pointed at how a global technology transfer usually perpetrates dependence. The works of Oyeyinka (2017) and Akinwale (2019) have examined the reforms in the policies of Nigeria and observed how little they have done in terms of fighting structural barriers. Docquier and Rapoport (2012), along with World Bank (2022), have analyzed brain drain and its negative implications for human capital development. While these studies provide valuable insights, they do not fully integrate the dual problem of dependency on Western technology and simultaneous human capital flight.

The inability of previous efforts to resolve these interconnected challenges forms the gap this study seeks to fill. Unless these issues are critically examined, Nigeria risks remaining in a

cycle of dependency that undermines its potential for meaningful industrialization in the twenty-first century.

1.3. Research Questions

This study is guided by the following research questions:

1. To what extent did the policies of the West in technology transfer impact the industrial development of Nigeria between 2015 and 2025?
2. Did brain drain of technological experts to the West undermine Nigeria's technological development between 2015 and 2025?

1.4. Objectives of the Study

The broad objective of this study is to investigate The West and the Politics of Technology Transfer to Developing States: The Nigeria Experience, 2015–2025.

The specific objectives are as follows:

1. To analyze the extent to which the policies of the West in technology transfer impacted Nigeria's industrial development between 2015 and 2025.
2. To investigate whether brain drain of technological experts to the West undermined Nigeria's technological development between 2015 and 2025.

1.5. Significance of the Study

This study contributes to the literature on the political economy of development by linking technology transfer with dependency theory and human capital flight. It provides empirical evidence from Nigeria, thereby enriching scholarly debates on how developing states negotiate their place in global technological hierarchies.

On a practical level, the findings will be useful to policymakers, government institutions, research agencies, and private sector actors. They highlight weaknesses in existing strategies and point to the need for frameworks that encourage indigenous innovation and retention of

skilled professionals. The study also aims to guide Nigeria toward building a sustainable technological base that can drive long-term industrial transformation.

1.6 Scope of the Study

The focus of this study is on the politics of western technology transfer and brain drain and their impact on Nigeria industrial and technological development in the period 2015-2025. The study is focused specifically on the effect of western policies on technology transfer and Nigeria's capacity for industrial growth, technological adaptation and innovation where skilled Nigerian professionals were migrating to the developed countries in the first two decades of the stated period. Does not go beyond this period of time and does not cover other historical eras not in this time frame.

1.7 Limitation of the Study

The study has experienced several limitations that might impact the scope and scope of the study. The research is only carried out on secondary sources, like journal articles, policy reports and international reports. These are credible, informative sources but other primary sources like interviews or field surveys, etc. may not be available to provide first-hand information about key players in the technology and industrial sectors.

Secondly, technology transfer and brain drain are multi-faceted processes, which are affected by other development related factors, which are beyond the control of Nigeria. It is difficult to determine the effect of Western policies when other domestic issues like corruption, poor governance and lack of research and development are also involved.

Third, reliable, consistent data is another challenge. Data on skilled worker migration, technology transfer agreements, and migration of skilled workers can be incomplete or variable by source. This is addressed in the study, however, by providing a triangulation of the information, which comes from credible national and international sources, to ensure balanced and reliable analysis.

1.8 Operational Definition of Terms

The West – Refers to developed industrialized countries of Western Europe and North America, such as the United States, the United Kingdom, Germany, and France, whose economies and technological superiority shape global technology transfer relations.

Technology Transfer Politics – The combination of power, policies, and negotiations that determine how technology is released between developed and developing nations. It emphasizes that technology transfer is rarely neutral but driven by strategic and economic interests.

Technology Transfer – The process of transferring scientific knowledge, innovations, technical skills, and production techniques between countries or institutions, often through foreign direct investment, joint ventures, patents, and imported machinery.

Developing States – Countries with low industrial capacity, weaker technological bases, and high dependence on external technologies, such as Nigeria.

Industrial Development – The growth of a nation's manufacturing and production base, measured by productivity, job creation, and economic diversification. In this study, it refers to Nigeria's attempts to build self-reliant technological capacity between 2015 and 2025.

Brain Drain – The large-scale migration of skilled professionals such as scientists, engineers, and ICT experts from developing countries to developed countries. Here, it refers to Nigerian professionals who migrated to the West during 2015–2025, reducing local technological capacity.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Literature review offers a critical evaluation of the available knowledge on technology transfer, politics of technology transfer and industrial development in developing countries but with specific reference to Nigeria in the next period (2015-2025). It reviews the major concepts, theories, and empirical works to put the current study within the academic discourse. The gaps in the previous study are also found in this chapter especially with regards to the synergistic impacts of Western policies and brain drain on the technological and industrial development of Nigeria. The review will be designed into conceptual analysis, theoretical framework, empirical studies, and identification of gap in the literature and will serve as a background to the current study.

2.1 Conceptual Review

Technology Transfer

Technology transfer is the process or the transfer of technological knowledge, skill, methods, equipment and innovations from one country, institute, organization to another to enhance productive and industrial capacity. The technology transfer is defined by Maskus (2004) as the diffusion of S&T knowledge from technologically advanced societies to less developed economies to enhance economic growth and industrialization. In the same vein, Todaro and Smith (2015) define technology transfer as the transfer of modern technology, managerial skills and technical expertise from the industrial world to the developing world so as to boost productivity and development. Technological advances have been seen as one of the major factors that influence the industrial and economic development of the modern world, and hence the concept has gained more prominence in the current global economy.

Technology transfer has been discussed as being more than simply the transfer of machinery and equipment; it involves the transfer of knowledge, managerial skills, organizational methods and research skills to innovate and grow industries. Lall (1992) believes that technology transfer takes place effectively only in countries which have institutional and human resources to absorb, adapt and improve the imported technologies. Similarly, Dahlman (2018) points out that it is not just about importing foreign equipment, but it is also learning, adaptation and innovation. This means that the transfer of technology is meaningful if the domestic industries are able to apply and adapt the imported technologies to the local context and requirements.

There are many pathways of technology transfer including foreign direct investment (FDI), multinational corporations, technical partnerships, licensing, joint ventures, trade, education and training programmes, and international research collaboration. Multinational corporations are significant in the transfer of technology to developing countries through technical cooperation and industrial investments, according to UNCTAD (2020). Likewise, OECD (2018) notes that technological innovations are spreading between countries via international trade and strategic alliances. The developing states are able to access through these channels the modern industrial methods, techniques and scientific knowledge which may not be easily created or developed at home.

The importance of technology transfer to developing countries cannot be overemphasized. The scholars Afonja (2011) and Oyeyinka (2017) contend that the ensuing benefits of technology transfer to industrialization and economic diversification, improves productivity, creates job opportunities and makes a nation competitive in the international market. Technology transfer has been regarded as a way of transforming developing countries like Nigeria where it can enable access to advanced production systems and technical expertise to enhance manufacturing and infrastructural development. Nigeria has been relying on foreign technologies, especially in the oil and gas, telecommunications, agriculture, manufacturing,

and information and communication technology (ICT) sectors, as a way to boost production and service.

Many scholars, however, have attacked the one-sidedness in the transfer of technology from one country to another, developed or developing. According to Chang (2003), advanced industrial countries frequently control critical technologies through IP rights, patents, licensing restrictions and only share information. This leads to the situation of developing countries relying on technological know-how from the West and imported innovations. Rodrik (2018) also notes that, in most cases, technology transfer is affected by the political and economic stances of the developed world, which are aimed at strengthening their technological position while restraining the industrial development of poorer nations. Consequently, a process of technology transfer can sometimes further dependence rather than technological autonomy.

However, in Nigeria, the success of technology transfer has faced a number of structural and institutional obstacles. Akinwale (2019) reasons the reasons for the nation's failure to effectively utilize imported technologies include poor infrastructure, inadequate funding for research and development, weak industrial policies, corruption and lack of technical man power. Likewise, Egbetokun (2015) noted that many industries in Nigeria are dependent on foreign expertise due to the inadequate technological competencies in Nigeria. As a result, despite the prolonged contact with foreign technologies for decades, the Nigerian nation continues to have problems in attaining sustainable industrial and technological self-reliance.

Another major challenge affecting technology transfer in Nigeria is brain drain. Highly skilled professionals like engineers, scientists, ICT specialists, and researchers have been leaving our country for developed countries, which has decreased our technological strength. As a result of the constant loss of skilled manpower, developing countries are unable to absorb, adapt and improve the imported technologies, as claimed by Docquier and Rapoport (2012). The loss of professionals to western countries in Nigeria has been a factor that has made the country

dependent on technology and hindered industrial innovation in the period between 2015 and 2025. The World Bank (2022) also observes that skilled migration from developing nations is detrimental to the development of their industries due to the loss of the critical human resources required for industrial technological development to the advanced economies.

In addition, technology transfer is not only an economic process, but also a political and strategic process. Amin (1976) contends that developing countries frequently fall into a subordinate position, requiring developed countries for technological, financial and know-how advancements. This dependency is seen to negatively impact the capacity of countries such as Nigeria to be able to have autonomous industrial development. Foreign technologies are often brought in under conditions that are more beneficial to recipient countries than donor countries or multinational corporations. Therefore, technology transfer can be viewed as a short-term benefit to industry, but can also be a long-term dependency on technology if local capacities and innovation are not developed.

To sum up, technology transfer is a tool of industrial and technological development in the developing countries and Nigeria is one such country. It helps to access the latest knowledge, technical skills, and industrial innovations that have the potential to boost productivity and economic development. However, it has been demonstrated that the process is frequently marked by unequal power distribution, dependence and institutional difficulties that hinder the ability of developing states to become technologically independent. Thus, if technology transfer is to play any significant role in industrial development in Nigeria, there is need of strong Nigeria's policy, investment in research and development, human capital development and strategy that will help to minimise excessive reliance on foreign technological expertise.

The Politics of technology transfer is the role of political power, international relations, economic interests and policy in transferring and distributing technology between countries. It discusses how the transfer of technological knowledge, skills and equipment, and innovations

may be determined not only by economic and/or developmental factors, but also by power relations in the global arena. Technology transfer often is determined by advanced industrial nations and multinationals companies who formulate policies and contracts in favour of their economic and strategic interests (Rodrik 2018). But in this sense, the transfer of technologies is not always impartial or unaffected, but mediated by political considerations, diplomacy and the world economy.

The politics of technology transfer has been linked with the unequal relationship between developed and developing countries in the international system. The dependency theory (Amin 1976) argues that, at times, advanced capitalist countries dominate the technology production and distribution, thereby putting developing countries in positions of dependency. Technically developed countries have the ability to exert control over key industrial knowledge and innovations through the use of intellectual property rights, patents, restrictive licensing agreements and trade regulations. This leaves the developing countries in a position where they are still greatly dependent on technologies that they have to import, yet fail to build their own technological capacity.

International institutions and global economic policies play a political role in technology transfer. It is determined by organizations like the World Trade Organization (WTO), the International Monetary Fund (IMF) and the World Bank. Developed countries tend to push for global trade and IP regimes which are more conducive to technologically advanced economies and prevent the growth of industrialization in poorer economies (Chang, 2003). Likewise, OECD (2018) reports that technological transfer agreements are often designed to reinforce the ownership rights of the donor countries and multinational corporations in order to ensure that the recipient countries do not benefit equally when it comes to technology.

IPR's are among the most important political levers impacting the international transfer of technology. Technological innovations and investments will be protected by intellectual

property laws, patents, copyrights, and trademarks. But others like Stiglitz (2007) contend that in certain instances IP laws can work against developing nations' ability to gain access to advanced technologies in order to develop their industries. Developed countries and multinational corporations have monopolies over key technologies and technologies in various fields like pharmaceuticals, manufacturing, information and communication technology (ICT) and energy generation through patent restrictions and licensing controls. This can restrict the ability of developing countries to reproduce, modify or improve imported technologies.

The other key aspect of the politics of technology transfer is that of multinational corporations (MNCs). Multinational enterprises are significant actors in technology diffusion since they have a high level of industrial information, resources and production capacities. UNCTAD (2020) states that foreign direct investment, technical partnerships and industrial training programmes are part of the ways in which multinationals contribute to industrialization in developing countries. The view of scholars like Hymer (1976) is that multinational firms often behave in a manner which ensures economic dependency by keeping control of the most essential technologies and decision-making processes. In many instances, the developing countries are not the technological innovators but rather the market for foreign goods and as sources of resources.

Geopolitical interests and international diplomacy also play a part in the politics of technology transfer. Restriction of transfer of sensitive technologies by advanced countries to developing countries can be caused by national security or strategic competition. Techno-strategically advanced countries have tight control over AI, Military, Nuclear, Aerospace and Digital infrastructure technologies. Gilpin (1987) has said that technology has turned into an instrument of global political power as nations who have the control of technological innovation also affect the international economic and strategic relations. As a result,

transferable technology could be selectively denied or provided as a matter of foreign policy interests and political connections.

The politics of technology transfer has played a significant role in the industrial and technological development in the Nigerian context. Nigeria has always relied on the western world for industrial equipments, technical knowledge and technology in various industries including oil and gas, telecommunication, manufacturing and information communications technology. Oyeyinka (2017) reported that the foreign technologies have aided the economy of Nigeria, but Nigeria still finds it difficult to achieve technological self-reliance because of the high level of reliance on imported technologies and machines. Local industries have poor ability to learn and innovate technology, and foreign firms often maintain control and ownership of critical technology.

In addition, restrictive contractual agreements and lack of knowledge sharing have hindered effective technology transfer in Nigeria. Akinwale (2019) notes that most technology transfer ventures in Nigeria are mainly geared towards equipment importation as opposed to the proper transfer of technical knowledge and research capacity. This results in the inability of local industries to maintain, replicate, and develop imported technology. This has resulted in less industrial productivity and has hampered indigenous technology development.

Brain drain also plays a link role in the politics of technology transfer in Nigeria. The brain drain of skilled manpower like engineers, scientists and ICT experts to the developed countries diminishes the country's ability to accept and utilize foreign technologies effectively. Docquier and Rapoport (2012) claim that this ongoing transfer of skilled migrants from developing countries to advanced ones further strengthens the dependency on technology and weakens their own innovation power. In 2015 to 2025, there was massive emigration of highly skilled professionals from Nigeria as a result of the challenging working conditions, insecurity and

lack of economic opportunities. This situation further constrained the country's capacity to use technology transfer effectively in the growth of industries.

Furthermore, Nigeria's institutional and policy failures have contributed to the failures of technology transfer. Technology integration and innovation have been impeded by poor infrastructural development, insufficient research and development (R&D) investments, corrupt practices, and inconsistent industrial policies and weak educational systems. Egbetokun (2015) pointed out that poor institutional support hampers the Nigerian industries to adapt imported technologies to the local environment. Despite decades of technological inflows from developed countries, technology transfer has not resulted in sustainable industrial transformation.

Finally, the politics of technology transfer shows that the transfer of technologies between countries is much shaped by the power dynamics of the world, political interests, and economic conditions. While technology transfer can be used to accelerate industrialization and economic development in developing countries like Nigeria, technology transfer is often an unequal process, in which technologically advanced countries and multinational corporations have the edge. There are still many factors that hinder the developing countries' technological independence, including restrictive intellectual property rights, selective dissemination of knowledge, geopolitics and institutional weaknesses. Hence, meaningful Nigeria's technology transfer to the benefit of the nation requires strengthening of the technological policy of the country, investment in human capital development, and policies to minimize over-dependence on foreign technological systems.

The West

For the purposes of this study, the “West” is mainly seen as the countries of Western Europe and North America, which are very industrialized and technologically advanced, including the United States, the United Kingdom, Germany, France and Canada. These countries have long

been seen as leaders in industrial production, scientific innovations, technological development and in international economic governance. Huntington (1996) describes the West as a civilization with "highly developed capitalism", industrialization, technological superiority and a "powerful political system" that have influenced economic and political systems around the world substantially. Likewise, Wallerstein (1974) states that "core" nations such as the Western countries have control over finance, industrial production, technological advancement and international trade.

The western countries became the powerful global powers in the era of Industrial Revolution and post-Industrial Revolution. With the swift industrialisation of countries like Britain, Germany, or the United States they were able to build up their wealth, increase their industrial potential and gain control of international trade and technological production. Landes (1998) states that the technological and scientific development of the West countries has made them great technological innovators and economic powers. They have industrialized and gained the comparative advantage in manufacturing systems, research and technological facilities over other developing parts of the world.

It has been suggested that the West still exerts its influence on technological production and hence on international relations and economic growth. It is important to highlight that Western countries have a lot of influence on global technology flows, as they own most of the advanced industries, patents, research institutions and innovation systems in the world (Rodrik 2018). Likewise, Chang (2003) maintains that industrialization of developing countries is constrained by the policies of developed Western countries for international economic and trade. Western economies have strategically controlled the distribution and usage of modern technologies through the use of intellectual property rights, licensing agreements and trade regulations.

The West also is a significant contributor to international institutions that govern economic and technological transactions. The economic interests of the West influence institutions like the

International Monetary Fund (IMF), the World Bank, the World Trade Organization (WTO) and other large multinational corporations. Western dominance in international institutions allows developed countries to shape global economic policies and technology standards that serve their industrial and/or strategic interests (Gilpin 1987). As a result, most developing countries rely on the West for industrial machinery, technical capabilities, digital technologies and money.

In the developing countries like Nigeria, Western countries have heavily engaged themselves in oil and gas, manufacturing, telecommunications, banking and information and communication technology (ICT). Oyeyinka (2017) has reported that the introduction of modern production systems, industrial machinery and technical training programmes in Nigeria have been introduced by the Western multinational companies. Western technology and expertise, for example, have long been vital to the oil and gas exploration, refining and production. Similarly, technology and capital investments in telecommunications in Nigeria have facilitated digital communication and connectivity, thus contributing to the telecommunications revolution in Nigeria.In the same vein, the telecommunications revolution in Nigeria was heavily influenced by Western and foreign technology investments that enhanced digital communication and connectivity.

Although this work has been accomplished, the scholars have criticized the unbalanced participation of the West in the developing countries. The dependency theorists of the west, including Amin (1976), have suggested that there are many relationships in the western countries that have the potential to perpetuate dependency and technology in the developing world. Advanced technologies are often transferred on restrictive terms, which will hinder local innovation and industrial autonomy in many cases. While the use of the western technological intervention has enhanced the performance of industries in Nigeria, local industries are still lacking in developing and sustaining technological innovations on their own (Egbetokun,

2015). This has led to over dependence on foreign inputs of skills, machines and technical assistance.

Another critique of Western dominance is that it can undermine the technological development of the native peoples in developing nations. The colonial and neo-colonial relations in history put African countries in a position as consumers of foreign products and suppliers of raw materials and not as centres of industrial innovation (Rodney, 1972). Today, this is still a legacy that affects technology relations between the West and developing countries like Nigeria. The domestic technological capability remains insufficient in the manufacturing sector, telecommunications, transportation and industrial production, as most advanced technologies are imported from the western countries.

Also, the West has become a great destination for skilled personnel from developing countries, which also contributes to the brain drain problem. The highly skilled workers in the Nigerian profession like engineers, scientists, ICT specialists, medical experts etc. leave the country for employment, better and higher salaries in western countries, and better research facilities. This migration pattern helps developed Western economies, but it harms developing countries' human capital, say Docquier and Rapoport (2012). Regular flight of skilled personnel from Nigeria to western countries diminishes the technological and industrial development of Nigeria.

Others, however, argue that western engagement has the potential of providing opportunities for development, if it is backed by good domestic policy. Todaro and Smith (2015) suggest that foreign technology and international collaboration can be beneficial to industrialisation as long as the developing country has robust institutions, an educated workforce and a good industrial policy. Geographical transfer of technology, training programs and cooperation with other countries can allow developing countries to acquire technological capabilities over time and enhance industrial productivity. The problem, therefore, for the countries like Nigeria is

not the Western involvement per se, but how they can relate with foreign technologies in such a way as to stimulate national development and promote self-reliance.

To summarize, the West is the technologically sophisticated and industrialized world which dominates the world of innovation, industrial production and technological distribution. Foreign investment, multinationals and technology transfer are important ways in which Nigeria's industrial and technological sectors have been affected by the Western world. This relationship has helped in the industrialization and modernization of the nation, but it has also raised concerns about indigenous innovation, power imbalance, and dependence on technology. The role of the West is therefore significant to this study as it helps to explain the effect of external influences on industrial development of Nigeria from 2015 – 2025 and technological inequalities in the world at large.

Industrial Development

Industrial development means increase, modernisation and development of the production, manufacturing and technological capacities of a country with the aim of boosting the economic productivity and national development. It is a change in the economic system from predominantly agriculture and primary production to industrial production, technology innovation and mass production of goods and services. Afonja (2011) defined industrial development as the development of productive industries that can create jobs, boost the national income, improve technological growth and contribute to economic diversification. Likewise, Todaro and Smith (2015) explain that industrial development is the strengthening of a country's industrial base, productive capacity and capabilities to enhance economic growth and living standards.

Industrial development is considered as one of the key signs of economic development and modernization. Some scholars (Rostow, 1960) believe that industrialization is an inevitable phase in the economic development of any society in terms of improving the productivity,

innovation, infrastructure and technological development of societies. Advanced technology systems, better export capability and more jobs are often hallmarks of countries that have robust industrial activity. The industrial development is thus playing a significant role in poverty reduction, wealth creation and global competitiveness of a nation.

There are a number of measures of industrial development. These encompass manufacturing productivity, technological innovation, industrial employment, infrastructure development, sources of energy, export performance, productivity and research and development (R&D) capacity. Oyeyinka (2017) noted that a country with a vibrant industry will invest heavily in technological research, human resource development and infrastructural development. In addition, the presence of modern machines, technical expertise, efficient transportation, stable electric power and government policies are essential for the industry to develop.

Technology is an integral part of industrial development. Lall (1992) argues that industrial growth is closely linked with technological capability since industries need the latest production techniques, innovation and technical skills to be competitive. Technology transfer from developed countries has thus gained significance as a means for industrial development in many developing countries. Foreign Direct Investment (FDI), technical cooperation and industrial cooperation via multinationals transfers the latest technologies to developing world countries, thereby enhancing production efficiency and productivity. Foreign technological innovations have brought different degrees of growth to sectors like oil and gas, agriculture, banking, manufacturing and telecommunications in Nigeria.

But it has been suggested that structural and institutional impediments are limiting industrial development in many developing countries. Akinwale (2019) identified inadequate infrastructural facilities, poor electricity supply, corruption, weak industrial policies, limited technological innovations, and insufficient funds for research and development as some of the challenges industrialization has faced in Nigeria. Likewise, Egbetokun (2015) states that

Nigeria industries still depend greatly on imported machines and foreign skills due to the fact that the technological skills of the locals are not developed. This has resulted in technological dependence which is not sustainable in the industrial growth.

The industrial sector in Nigeria had been very dynamic in the past following independence, especially during the oil boom period of the 1970s. Import substitution industrialisation was introduced as a government policy to promote locally produced goods and not relying on imports. These policies helped to create industries in textiles, food processing, cement making, steel making and consumer goods, as reported by Aremu (2005). The economic instability, policy fluctuation, foreign exchange crises and inadequate infrastructure over time, though, led to the deterioration of many local industries.

Foreign technology and products dependence is another serious problem in the industrialization of Nigeria. It is believed that the developing countries continue to be industrially weak due to their reliance on industrial inputs, technical know-how and machinery from the advanced countries, as argued by dependency theorists like Amin (1976). There are lots of manufacturing companies that are still relying on foreign raw materials, spares and technological systems in Nigeria. This dependency will hinder local innovation and make it more vulnerable to global economic cycles.

Brain drain has also had a detrimental impact on industrial development in Nigeria. Skilled people like engineers, scientists and ICT experts have left the country for developed countries which affected the country's industrial and technological capacity. Docquier and Rapoport (2012) point out that in developing economies, a constant loss of skilled workers has consequences for productivity, innovation and industrial efficiency. Nigeria had a high emigration of professionals between 2015 and 2025, attributed to the high unemployment rates, inadequate working environment, insecurity and lack of research opportunities. This situation

has hampered the country's ability to make effective use of imported technologies for industrialization.

In addition, there has been poor funding of education and research institutions, thereby constraining industrial innovation in Nigeria. Strong partnerships among industries, universities and research institutions are essential for sustainable industrial development, according to UNCTAD (2020). The Nigerian research and development sector, however, is underfunded, which reduces the technological creativity and local production capacity. As a result, it is still heavily reliant on foreign technology and imported manufactured products.

However, all these setbacks have not deterred industrial development from being a vital instrument for Nigeria's economic metamorphosis and national development. A robust industrial base can provide jobs, lower levels of poverty, boost export revenues, and boost technological development. Todaro and Smith (2015) argue that developing countries can achieve sustainable industrialization by investing in human capital, infrastructural development, technological development, and good industrial policies. Hence, policies that will promote local manufacturing, reinforce technological research, enhance infrastructure and lessen over-dependence on foreign technologies are needed for any meaningful industrialization development in Nigeria.

Finally, industrial development is the process of expansion and modernization of a country's productive and manufacturing base in order to get economic growth and technological developments. It has been a key element for national development as it contributes to productivity, employment, innovation and diversification. While Nigeria has been trying to industrialize, its development has been constrained by factors like technological dependence, poor infrastructure, inadequate policy implementation and brain drain. Thus, the effectiveness of the technological transfer as well as the enhancement of indigenous innovation and human

resources development in Nigeria over the period 2015 – 2025 is essential to the success of industrial development in Nigeria.

Brain Drain

Brain drain is the regular movement of highly skilled professionals from the less developed countries to the more developed countries for a better remuneration, better working conditions, better living standard and better career opportunities. Brain drain has been defined as international skilled migration, which involves losing human capital from the country of origin, especially in areas of critical need, like science, engineering, information and communication technology (ICT), healthcare and academia (Docquier and Rapoport 2012). This is a phenomenon which is well-documented in the development literature due to its far reaching implications for productivity, innovation capacity and long-term economic development in the sending countries.

Brain drain is due to "push" and "pull" factors, explains scholars. In developing countries, push factors are low wages, low productivity, political instability, not enough infrastructure, not enough research facilities, and the lack of support for professionals from the institutions. Pull factors in developed countries include, on the contrary, higher wages, workplaces, advanced technology, stable political systems, and professional development and research opportunities (OECD, 2019). This has a continuous chain of skilled workers moving from the developing countries to the developed countries, causing a continual loss of human capital from a developing country like Nigeria.

The effects of brain drain in developing countries are large and complex. The reduction in the domestic human resource for industry and technology is one of the most significant impacts. Human capital is essential for economic growth as it plays an important role in productivity, innovation and utilizing technology (Todaro and Smith, 2015). If there is a significant exodus of skilled employees, then the ability of the country to absorb, adapt and improve imported

technology is significantly curtailed. This affects the performance of industries badly and it also slows down the development of technology.

The brain drain phenomenon, in Nigeria context, has been prominently observed in ICT, Engineering, medical field and Industrial production. The work opportunities and career outlook for such skilled professionals in these areas is more favourable in many countries in Europe, North America and the Middle East, leading to skilled professionals often moving there. It is observed that Nigeria has lost large population of skilled workers over the years, which has impacted the nation's industrial and technological development, according to the World Bank (2022). It is also aggravated by the lack of adequate working instruments, poor funding and institutional support for many of the remaining professionals.

Bhagwati and Hamada (1974) claim that the brain drain results in a structural imbalance between the developing and the developed countries as the skills and training that the developing countries provide are used by the developed countries and the developed countries do not provide any skill or training to the developing countries. So, in other words, developing countries invest in education and training of professionals and end up losing them to advanced economies where they had not paid for the initial investments in human capital. This creates a “reverse subsidy” from poor to rich countries, increasing inequity in the world.

Brain drain also impacts directly on technology transfer and development of industry. In addition to the availability of machinery and equipment, the availability of skilled persons who can operate and make improvements to technologies is essential for technological progress as pointed out by Lall (1992). Without sufficient human capital, technology transfer can be less effective – new technologies may not be used or adapted effectively to local conditions. The challenge is present in Nigeria through the need for foreign experts in key industrial sector for maintenance and technical support.

In addition, the absence of human resources with innovative skills is a reason for weak innovation systems in developing countries. The success of innovation in the company and at the national level will be largely based on the ability of the company to have skilled researchers, engineers and technical experts who can come up with new products and improve the existing processes in the firm (Egbetokun, 2015). These people create little innovation, and as a result, reliance on foreign technologies remains. This further embeds dependence on technology and reduces the chances for sustainable industrial change.

Although the harmful aspects are seen, there are some scholars who consider that brain drain can bring benefits too in the form of remittances, transfer of knowledge and diaspora networks. But these advantages are not enough to compensate for the shortage of human capital in key industries. Remittances make an impact on household incomes and foreign exchange earnings, but lag in addressing institutional and productive losses of migration of skilled workers (World Bank, 2022).

Finally, brain drain is a serious development problem in Nigeria and other developing nations because of its continuous loss of manpower with skills that are required for Nigeria's industrialization and technological development. It has a special impact on the effectiveness of technology transfer, decreasing innovation capacity and strengthening dependence on foreign expertise. Thus, better working conditions, remuneration, and institutional support are vital in improving industrial development in Nigeria between 2015 and 2025 to address brain drain.

Developing States

Developing States are the countries with relative low level of industrialization, technological capacity and capital formation and have less level of socio-economic development compared to the advanced industrial countries. Todaro and Smith (2015) characterize the developing countries as countries with low income per capita, high unemployment rates, poor productive organization, and poor infrastructure and institutions. Such countries tend to be undergoing

economic transition from an agrarian economy to a more diverse, industrialized one, and the extent of the transition, and its success, also differs greatly from region to region.

On a structural level, scholars believe that the developing states are subordinate in the global economic system. Some dependency theorists, like Frank (1967) and Amin (1976), argue that the underdevelopment of these states is not a stage of history but a state created through their incorporation into an uneven global capitalist system. In such patterns, the developing countries typically provide raw materials and markets for the industrialized ones for their industrial products, thus reducing their ability to establish their own technology and industrial systems. In his analysis, Wallerstein (1974) further notes that developing countries are normally situated in the "periphery" of the world system, relying heavily on "core" countries for technology, capital and industrial skills.

A characteristic feature of developing states is a lack of industrial sector. UNCTAD (2020) notes that many developing countries are facing challenges related to low levels of manufacturing output, limited technological innovation, and inadequate integration into global value chains. The industrial sector is underdeveloped and is very much dependent on imported machinery, foreign technical expertise and external investment in these countries. For Nigeria industrial development has been hampered by poor infrastructure, erratic power supply, inadequate transportation facilities and lack of research and development investment. These constraints have a very severe impact on the country's capacity to implement technology transfer in order to implement sustainable industrial development.

Limited technological capacity is also very characteristic of developing countries. While technological capability is a key determinant of industrial growth, many developing countries do not have the human resources, institutions and research facilities to absorb and transform the technologies imported into them, as Lall (1992) points out. Consequently, in these countries, technology transfer frequently results in only dependence and not innovation. For

example, in Nigeria, technologies are often imported without any adaptation, thus reducing their developmental potential in the long term. According to Egbetokun (2015), the failure in firm level capabilities as well as low level of innovation system also limit the efficiency of technology adoption in the Nigerian industries.

Another obstacle to development in developing countries is institutional weakness. Akinwale (2019) attributed the lack of governance, lack of consistency in policy, corruption, and poor regulatory frameworks as the major challenges facing industrial development and technological advancement in many developing countries. For industrialization to take place, these institutions need to be stable and to be able to implement long-term development strategies, to facilitate innovation and to allocate resources efficiently. But in many developing states, the volatility of policies and ineffective policy enforcement are significant obstacles to development planning and continuity of industry.

Moreover, human capital issues are often severe in developing countries, such as brain-drain. Skilled migration from developing to developed countries is a process that decreases the amount of industrial and technological skills available in the developed countries, as explained by Docquier and Rapoport (2012). The country of Nigeria, like many other developing countries has witnessed a steady exodus of professionals in the engineering, information and communication technology, medical and scientific research fields. The loss of skilled manpower will reduce the ability of the country for innovations, maintenance of industrial systems and effective use of imported technologies.

In addition, developing countries are greatly influenced by global trade imbalance and trade inequalities. Chang (2003) states that international trade and intellectual property regimes are designed in a manner that tends to benefit developed countries and limit the capacity of developing countries to be competitive in international markets. Technology transfer restrictions, heavy capital goods import costs, and reliance on foreign capital are disadvantages

for developing countries to industrialize. The difficulty of developing countries to implement independent industrial policies also arises from the fact that, according to Rodrik (2018), the international economic governance is often driven by the interests of advanced economies.

Even in the face of these difficulties, developing countries continue to seek ways to advance industrialization and industrial technology. Stronger domestic production systems have been the interest of many countries which have embraced policies like import substitution industrialization, export oriented industrialization and technology acquisition plans. UNCTAD (2020) has said that besides the access to foreign technologies, the development must also have sound home capacities in innovation, education, infrastructure and governance. Unless these internal strengths are present, the transfer of technology will not be enough to realize the sustainable industrial transformation.

Multiple structural constraints exacerbate development problems in Nigeria. Slow industrial growth has been caused by poor infrastructure, weak industrial policies, inadequate funding of research institutions and political instability. All these factors reduce the extent to which the country can make use of foreign technology inflows. Even though Nigeria's industrial sector is still confronted with numerous challenges in the adoption of imported technologies for sustainable production practices, Akinwale (2019) states. Therefore, Nigeria, a huge developing economy in Africa, is not yet achieving regular industrial modernization.

To sum up, developing states are those states that have limited industrial and technological capacity, weaker institutional structures and less economic development (compared to advanced states). They are structurally less placed in the global system and have restricted capacities in achieving independent industrial growth. Technology transfer processes are opportunities for development but have limitations due to institutional weaknesses, brain drain and unequal global economic relations. Thus, it is crucial to comprehend the character of

developing countries in order to provide an explanation for why Nigeria will be experiencing problems in sustainable industrial development from 2015 to 2025.

2.2 Theoretical Review

2.2.1 Dependency Theory

The dependency Theory was known to have initially been propounded by Andre Gunder Frank in 1967, and later on by other academics like Fernando Henrique Cardoso and Samir Amin in the 1970s. The theory appeared as a criticism of the modernization views and that underdevelopment in some countries is not simply an absence of progress or a status of underdevelopment, but a state that is actively created in the associative relationship between the countries and the developed countries (Frank, 1967; Amin, 1976; Cardoso and Faletto, 1979). The Dependency Theory states that the world economic system consists of a core of developed nations and a periphery of developing nations, with the latter being so systematically limited and exploited in the favor of the former. Such an unequal relationship guarantees the continued existence of the wealth and technological advancement of the developed countries at the cost of the developmental capacity of the peripheral states.

Dependency Theory can be used to critically analyze the process of industrial development in Nigeria in the context of technology transfer between 2015 and 2025. According to the theory, developing countries usually depend on developed countries in terms of capital, expertise and technology which entails structural dependency and impairs autonomy locally (Cardoso and Faletto, 1979). In the case of Nigeria, technological injections at the West (in terms of industrial equipment and information and communication technology) are often followed by policies, licensing contracts, and intellectual property limitations, which give more priority to the interests of the donor countries. Although foreign companies in Nigeria can offer training and machinery, this is usually at the expense of the local industries, which can hardly develop on their own (OECD, 2018).

Besides, Dependency Theory emphasizes the role of human capital in the mediation of technological development. The case of Nigeria brain drain, when the skilled technological experts are migrating to the Western countries, is a perfect example of how dependence is reinforced even when imported in the technology (Docquier and Rapoport, 2012). The loss of engineers, ICT specialists, and scientists diminishes the national ability to use, make changes and build development on imported technologies. This leads to the limitation of industrial development and the nation continues to be dependent on foreign experience and directions. This evidences the main assumption of the theory that the structural position of third world countries within the world system is actively creating the circumstances in which it is hard to achieve self-sustaining development.

In reality, Dependency Theory relates to the inability of policies that focus on importation of technology to generate sustainable industrial development. Nigeria has no systems that can keep talented individuals, increase local innovation, and create fair technology deals, which will leave the industrial sector in a dependency loop. Dependency Theory has been used by scholars to examine industries like oil and gas, manufacturing, and ICT and found Western control of technology and capital to continue to create structural inequalities and constrain the possibility of endogenous industrial development (Amin, 1976; Rodrik, 2018).

To conclude, the Dependency Theory shows the asymmetricity between the developed and the developing countries, which in the case of Nigeria, limits the industrial development of the country because of the dependence on Western technology and skills. Combining the theories of technology transfer and brain drain therein, the current study can focus on the critical analysis of the political, economic, and structural aspects that would influence the industrial relations between 2015 and 2025 in Nigeria.

2.2.2 World-Systems Theory

Immanuel Wallerstein developed World-Systems Theory in 1974 as a continuation of historical and economic studies of the inequalities in the world. According to the theory, the world is organized in a manner that it is composed of an interconnected economic system filled with a core, periphery and semi-periphery whereby the core countries are those countries that control the global trade, capital flows and technological advancements, whereas periphery countries are exploited because of their resources, labor and markets (Wallerstein, 1974; Chase-Dunn and Grimes, 1995). The theory suggests that such stratification is not something accidental, it is systematic, it is what determines political, economic, and technological progress of the countries. Position in global system limits peripheral countries like Nigeria because they lack the ability to develop by themselves as the interests and growth of core countries are prioritized in global system.

World-Systems Theory offers an insight to study the experience of Nigeria during the years between 2015 and 2025 in the context of technology transfer. It is the theory of how Western nations, being the global core, dominate the manufacturing, distribution and licensing of advanced technologies, thus continuing their asymmetrical power relations with the developing nations (Rodrik, 2018). In the frontier, Nigeria, is prone to technology with clauses that serve the interests of the donors and restricts localization and industrial inventions. As an example, licensing protocols and intellectual property laws and selective access to technical know-how enable Western companies to maintain ownership of important technological procedures and grant a small area of capacity building through endogenous means (OECD, 2018).

Another aspect World-Systems Theory focuses on is structural constraints of the peripheral states in terms of human capital and institutional development. Brain drain or the movement of talented Nigerian workers to the Western nations exacerbates the issues of technological and industrial development. It is true that technology can be imported, but the lack of a proper

workforce that is skilled enough to use, adapt and innovate around these technologies disrupts the possibility of such imports being beneficial (Docquier & Rapoport, 2012). The given dynamic portrays the wider structural constraints that are pointed out by the theory: peripheral nations continue to rely on core states in terms of essential knowledge, expertise, and capital.

In addition to this, the theory gives an explanation of how technological dependence can be cyclical in nature. With the high-tech industries and innovations being dominated by core countries, the peripheral countries are usually relegated to low-value part of the production process or reliant consumption of the imported technologies. This trend is represented by oil and gas, manufacturing, and ICT, industries in Nigeria, where the main operations are dominated by foreign technologies, and home-grown innovation and industrial capacity are low (Akinwale, 2019). Technology transfer, therefore, cannot guarantee industrial development given that, it has to be coupled with strategic policies, human capital investment and dependency mitigation measures.

Finally, World-Systems Theory emphasizes the inequalities of structures which influence the distribution of technology all over the world and the role of Nigeria being a peripheral state in the world-system. Through this framework, the research will be able to determine the effect of Western domination of technology along with local issues like brain drain on industrial growth in Nigeria. The theory supports Dependency Theory by focusing on how technological dependence is a systemic phenomenon, and the long-term impact of global power relations on the developing states.

2.2.3 Diffusion of Innovations Theory

Diffusion of Innovations Theory is the theory that was postulated by Everett M. Rogers in 1962 and which is concerned with how the new ideas, technology or practice communication and adoption in the social system occurs over time. According to Rogers (2003), diffusion refers to the spread of innovation that involves communication of the innovation in some channels to

members of the social system. Among the factors that are identified to affect adoption by the theory are the perceived relative advantage of the innovation, compatibility with the established practices, complexity, trialability, and observability. Rogers further divides adopters into innovators, early adopters, early majority, late majority and laggards, which are varying levels of adoption in a population or organization.

Diffusion of Innovations Theory can be used in the context of technology transfer in the way of how the imported technologies of the Western countries are adapted and incorporated into the developing countries, including Nigeria. According to the theory, the availability of a foreign technology alone is not a determining factor towards successful technology transfer, but the social, economic, and institutional context under which the technological diffusion can be healthy or ill (Rogers, 2003; Valente, 1995). Western technologies as applied in various sectors such as ICT, manufacturing, and oil and gas in Nigeria have been influenced by some factors including compatibility of technology with local infrastructure, presence of skilled human resources, and institutions ability to aid the innovation.

Moreover, the theory brings into focus the contribution of human capital in the process of diffusion. The process of brain drain or emigration of talented professionals out of Nigeria to the West restricts the abilities of the domestic industries to absorb and assimilate imported technologies (Docquier and Rapoport, 2012). The lack of skilled staff is a defeat in effective implementation and decreases the chances of local innovation even in case the Western technologies are accessible. That is why inflows of technology are not always likely to produce significant industrial growth unless they are complemented by training and retention and deployment of skilled workers.

Similar attention to the significance of communication channels and social networks in promoting the technology adoption is also raised in Diffusion of Innovations Theory. In Nigeria, the cooperation with foreign companies, alliances with educational establishments,

and governmental programs including the National Science, Technology and Innovation Roadmap (20172030) can be used as avenues of technology transfer. The success of these platforms, however, is frequently limited by bureaucratic issues, insufficiency, and lack of proper policy framework, which decreases the speed of adopting and adapting technology at the national scale (NITDA, 2021).

To conclude, Diffusion of Innovations Theory is an addition to Dependency and World-Systems views that are based on micro and meso-levels of adoption and utilization of technology in developing states. It stresses that technology transfer in itself is not necessarily positive, the factor is the reception, adaptation, and integration of the innovations to the existing industrial and social systems. In the case of Nigeria, the theory is used as a prism to comprehend the issues of technological adoption, the significance of knowledgeable human resources and the significance of favorable institutional frameworks in developing industries until 2015-2025.

2.3 Empirical Review

In Economic Development, Todaro and Smith (2015) adopted qualitative research of development policies in various developing nations, such as Nigeria, to examine development transfer of technology in economic growth. They discovered that the availability of modern technologies is paramount to the industrial growth and global competitiveness. Their study however did not directly examine the political aspects of the western technology policies or how brain drain specifically influences the ability of Nigeria to absorb and use foreign technologies, as this study will attempt to analyze.

In Globalization, Brain Drain, and Development, Docquier and Rapoport (2012) utilised the secondary data analysis of statistics on international migration to explore the effects of skilled migration on developing economies. They concluded that brain drain has a serious impact of shrinking the technological and human capital capacity of sending nations, such that they

cannot enjoy the benefits of foreign technologies. Nevertheless, their work was global and it was not particularly about Nigeria or 20152025, and this gap in research will be addressed by this study.

In his book Straight Talk on Trade, Rodrik (2018) used comparative policy analysis to examine the trade and technology flows between developed and developing countries. The conclusions made were that Western economies tend to form technology pacts that are favorable to them economically and strategically and this supports dependency in the developing economies. However, it failed to address the particular effects on the industrial development of Nigeria and how skilled human capital migration could moderate the adoption of technology.

In Expanding Legal Migration Pathways from Nigeria to Europe, the World Bank (2022) made policy analysis to analyze the factors affecting skilled migration and its developmental consequences. The paper has emphasized that fears of brain drain in source nations are created by the pressure of emigration such as unemployment and non-availability of opportunities. However, it focused more on the mechanisms of migration and not on the relationship that brain drain has with the efficiency of the transfer of technology and industrial development in Nigeria as this study examines.

In the International Technology Transfer Policies, OECD (2019), has performed a thorough policy review and analysis of how technology is transferred. The report revealed that the Western policies usually put obstacles in the way of fair access to technology by imposing licensing rules and copyrighting. Nevertheless, it has not paid particular attention to Nigeria and has not tested the impact of migration of skilled professionals on technology uptake and industrialization.

In the article Interactive Learning and Firm-Level Capabilities in Latecomer Settings: The Nigerian Manufacturing Industry, Egbetokun (2015) examined the role of technology acquisition and learning among Nigerian manufacturing firms. The research observed a low

level of correlation between formal training programs and innovation results, which indicated that other factors such as organizational and institutional capabilities are more determining. It however did not take into account the consequences of brain drain on industrial innovation which is one of the main concerns of this research.

In Challenges of Technology Transfer in Africa, Akinwale (2019) employed interviews with managers of industries and policymakers in understanding the obstacles to the implementation of foreign technologies. The results indicated that technology transfer was inhibited by poor infrastructure, low skilled workforce and restrictive foreign policies. The article failed to conduct a systematic analysis of the role of Western political interests in technology inflows or the precise consequences of that to Nigeria in 20152025.

In Technological Capabilities and Industrialization, Lall (1992) undertook a review of empirical and theoretical literature on the subject of technological capabilities in the developing countries. Lall came to the conclusion that foreign transfers do not affect industrial growth much when there is no domestic capacity to absorb and enhance imported technology. Nevertheless, the 20152025-specific empirical data on Nigeria was unavailable, which this paper focuses on to present the current analysis of outcomes of technology transfer and brain drain.

2.4 Gap in Literature

The studied reports indicate that in developing countries such as Nigeria, technology transfer and human capital plays a significant role in industrial development. Although Todaro and Smith (2015) and Lall (1992) pointed out the role of foreign technology, they did not developed the political and structural aspect of Western technology policies and how the brain drain affects the industrial development of Nigeria. In the same way, Docquier and Rapoport (2012) and the World Bank (2022) were also on skilled migration and did not directly associate the two with the adoption of technologies and industrial development in Nigeria.

There were other empirical results by other scholars like Rodrik (2018) and OECD (2019) on the policies and reliance on technology globally but none specifically on Nigeria. At the firm-level, Egbetokun (2015) and Akinwale (2019) detected hindrances to technology adoption, but they did not examine how Western policy limitations and the human drain of skilled specialists in 20152025 interacted.

Thus, there exists an evident knowledge gap in the explanation of how western technology policies and the exodus of Nigerian technological specialists affect the industrial development together. This paper will attempt to fill this gap by discussing the two factors in the context of industrial growth in Nigeria between 2015 and 2025.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

The systematic procedure in which research is conducted to investigate a problem, gather data, analyze information and form valid conclusions is called methodology. It serves as a blueprint for guiding a study from its initiation to completion, and allows the objectives of the research to be met with accuracy and reliability. Kothari (2004) defines research methodology as "A method for systematically solving the research problem by taking a logical step." It not only tells you how to do it, but also why!

According to Creswell (2014), methodology is the philosophies and general principles that guide the selection of research methods. It is more than just the data collection techniques, but also the reasons for the use of the techniques in relation to the research problem. Oso and Onen (2009) state that methodology is the central one in research since it outlines the strategies to be taken in collecting and analysing data which connect theory to empirical data.

Based on this, methodology is the basis on which to examine the politics of technology transfer from the west to Nigeria between 2015 and 2025, and the effects of brain drain on industrial development in this study.

3.1 Theoretical Framework

Theories are highly relevant because they can explain and predict phenomena; they can help researchers make sense of the world they live in. Theories, though definitions of theory differ, tend to focus on conceptualizing research, and their importance in hypothesis formulation. A theory, Kerlinger and Lee (2000) said, consists of related concepts, definitions, and propositions that explain or predict events, and that specify the relationships among variables. The explanatory and predictive function of theory is emphasised in this definition and central to scientific inquiry.

Blaikie (2007) builds on this viewpoint by stating that theory is a coherent set of ideas that help researchers analyse and interpret data. This means that in addition to explaining phenomena, theories are also used as interpretative tools to analyze findings. Likewise, in the social sciences, Giddens (2013) contends that theory serves two purposes: it as a means of organising knowledge and it as a means to connect observations with general principles. Theories can be based on empirical observations, reasoning and/or pre-developed ideas, but in all cases, they serve as building blocks for explanations of complex social phenomena.

In addition, Popper (2002) emphasizes the scientific element of theory as one that must explain and predict aspects of the phenomena that can be tested and potentially falsified. Theories can then be dynamic, flexible, and continually improved with ongoing research. All these views indicate that theories are essential for research, as they provide depth in explanations and directions for methodology.

To achieve a more in-depth understanding of the current study, it is essential to include a suitable theoretical approach that can give a more in-depth and extended analysis of the topic discussed. The Dependency Theory is one of the many theories that have been proposed and is most appropriate to this research.

3.1.1 Dependency Theory

Modernization Theory began to be challenged in the late 1960s and early 1970s by Dependency Theory, which argued that underdevelopment was largely due to the internal factors of developing countries. The Major supporters of the theory are Raúl Prebisch, Andre Gunder Frank (1967), Theotonio Dos Santos (1970), and Fernando Henrique Cardoso (1972). The theory states that underdevelopment of the Global South is a product of its embedding in an unequal world capitalist system controlled by the advanced industrial economies.

In Andre Gunder Frank's conception (1967) development and underdevelopment are two interrelated results of the same global system, with the affluence of the “core” (developed)

directly connected to the exploitation of the “periphery” (developing). In a similar way, dependency is defined by Dos Santos (1970) as a state where the economic development of some countries is regulated, influenced and determined by the expansion and interests of dominant economies that they are subordinate to.

Prebisch and the United Nations Economic Commission for Latin America (ECLA) also singled out structural imbalances in the international division of labour, in which the developing countries are restricted to the exportation of raw material and the importation of manufactured goods and technology from the developed countries. This is a vicious circle that promotes enduring dependency and restricts growth of industries in developing states. The theory was extended by Cardoso (1972) who added the notion of “dependent development” – that some development takes place in the periphery, but is externally controlled and does not produce economic autonomy.

It builds on the premise that the international system of the economy is fundamentally unequal and is designed so that the developed countries systematically benefit at the developing ones' expense. It also implies that underdevelopment is an historical and structural result of unequal international relations and that it is not a natural or internal condition. Moreover, it implies that there is a constant stream of resources, capital and the economic surplus from developing countries to developed countries, thus perpetuating the global inequality. It also assumes that the developing countries are structurally dependent on the advanced countries for funds, technology, and industrial skills and thus have only restricted ability for autonomous development. It also assumes that technological innovation and industrial production takes place for the most part in the developed countries, and that developing countries are major consumers of technologies developed in the west. Lastly, it assumes that even where development happens in developing countries it is often managed by outside influences and not necessarily a form of economic or technological autonomy.

3.2 Application of the Theory

The dependency theory offers a strong theoretical framework for examining the politics of technology transfer from the West to developing countries like Nigeria. The theory suggests that the global economy is designed to benefit industrialized countries of the West (the "core") and to disadvantage developing countries (the "periphery"), that the global economy is characterized by dependency and that dependency is a function of underdevelopment (Frank, 1967). The theory gives insights into the reason Nigeria, with all its policy efforts, continues to depend on the western nations for technological advancement, if seen in the context of technology transfer. According to this framework, technology cannot be transferred neutrally, without regards to the interests of the transmitting and receiving countries, or benefits for the receiving country; but it is rather imposed upon them as a part of the global political and economic interests that bring about dependency and underdevelopment (Dos Santos, 1970).

One of the key elements of dependency theory is the concept of unequal exchange. Nigeria, for instance, has seen the introduction of technology transfer which has in most cases been linked to intellectual property rights, technology licensing and ownership of technology patents that are in the hands of western firms. Therefore, Nigeria is only able to access products and systems and not the knowledge base for innovation and replication. It is in line with the prediction of dependency theory which states that the periphery is systematically deprived of the ability to develop on its own, and consequently is kept subordinate to the core (Cardoso & Faletto, 1979). For example, high-value research and development are typically outsourced to foreign countries, while multinationals (MNCs) like Microsoft and General Electric open new operations in Nigeria, but high-tech innovation is not done in Nigeria.

Moreover, dependency theory emphasizes that political and structural features of the developing nations are frequently designed to benefit more the interests of the abroad powers. The regulatory environment and industrial policies in Nigeria between 2015 and 2025 have

been designed to promote innovation and digitalisation, but their relevance and focus have been shaped by the priorities of donors, trade agreements, and Western corporations. This dynamic shows that dependency is more than just economic, it is political too: the strategic interests of powerful Western actors determine the technological routes available for Nigeria. Rather than self-reliant industrialization, Nigeria is instead often forced into the global markets as an importer of technologies or innovations, instead of becoming a producer of indigenous innovations, perpetuating the cycle of dependency.

Nigeria's constant problems with brain drain is also an illustration of technological dependence that is at the core of dependency theory. Many skilled Nigerian engineers, scientists, and ICT experts are trained in Nigeria and leave for the West in search of better job offers, resulting in a low capacity in the country to absorb and adapt imported technologies. According to dependency theorists, this migration of human capital is not happenstance, but rather the result of the operation of the global capitalist system which attracts talents from the periphery to the core, while the periphery remains underdeveloped. Therefore, where technology is transferred into Nigeria, the absence of skilled local manpower to operate and develop such technology ensures that Nigeria will continue to depend on external actors to provide them with technological solutions.

Another aspect of dependency theory is the unequal benefits of technology transfer contracts. Parties in the west and the corporations benefit from the expansion of their markets, technological knowledge is kept under their control; Nigeria in a way benefits, but not in full. For instance, collaborations in the ICT domain can create short-term jobs and training, but may not lead to a sustainable industrial development. This is an example of the “dependent development” of peripheral states that Dos Santos (1970) talked about: development which is externally generated but which ultimately serves to perpetuate rather than to overcome structural inequalities.

At a more general level, dependency theory provides an explanation for the mixed results in the adoption of technology transfer in Nigeria from 2015 to 2025. However, there have also been unquestionable advances in access to cutting-edge technologies, digitalisation and foreign industrial partnerships. Conversely, the underlying structural frameworks that determine the nature of these transfers have sustained dependency, constrained local innovation and prevented technological autonomy. Global economic and political arrangements therefore provide a compelling lens through which to understand these paradoxes, for dependency theory suggests a link between these and the level and effects of technology transfer in developing countries.

3.3 Hypotheses

The following are the hypotheses to be used as tool for this research work:

1. Between 2015 and 2025, Nigeria's industrial development was largely hindered by the policy of the West in technology transfer because it was over-reliant on western technology and expertise.

2. The shortage of technological experts between 2015 and 2025 was a major contributor to Nigeria's technological underdevelopment due to brain drain of technological experts to the west.

3.4 Research Design

The research design used in this study is ex post facto research design in which the study is conducted after the events have taken place to determine the possible causes and effects. Ex post facto research, as Kerlinger (1973) states, is a type of research that attempts to ascertain relationships between variables where existing conditions or events are studied. The study is appropriate to this research because it is a study of the brain drain of Nigerian technological experts and the policies of the western countries in relation to technology transfer, which took place within the period of 2015 – 2025. As it is based on existing documents, inferences can

be drawn in the researcher's mind on how these events in the past have affected Nigeria's industrial and technological development.

This type of research design is especially applicable in this study, since the researcher cannot control the variables such as western policies or migration decisions, but will have to use secondary sources, such as government policy documents, publications on technology transfer, reports by international organizations and scholarly works. This in turn helps the researcher to study the cause and effect relationships in relation to Nigeria's reliance on Western technology and human capital flight.

3.5 Method of Data Collection

This study uses the secondary method of data collection in the qualitative research. The sources of secondary data are existing, reliable and trustworthy materials like Journal of Academic Papers, Scientific books, Government publications, Report from National Information Technology Development Agency (NITDA), Policy Document, Media Report and Publication of International Organizations like United Nations Conference on Trade and Development (UNCTAD), World Bank and Organisation for Economic Co-operation and Development (OECD). These sources can contribute valuable information on technology transfer, industrial development and brain drain. This method is suitable for the study, as the study aims to analyze the trends and historical developments that are already known, and not perform a survey or field interviews from 2015 to 2025. Secondary data usage guarantees a wide and encompassing view of the politics of technology transfer, as well as the implications for Nigeria's industrial development. The study uses various sources of documented evidence, which allows for multiple viewpoints to be included and provides a solid basis for analysis.

3.6 Method of Data Analysis

The research is qualitative content analysis to analyze the data obtained from secondary sources. Analyses include the systematic review and interpretation of textual materials like

government policy frameworks, reports by international agencies, academic publications and media articles. The study uses the process of categorization and thematic coding to highlight recurring patterns, important themes, and narratives of Western policies on technology transfer and migration of Nigerian technological experts. This approach, in particular, is appropriate because it enables the researcher to transcend a mere quantitative measure and reveal meanings within the politics of dependency and development. The study uses content analysis to give nuanced insights into technological dependence, structural implication of brain drain, and challenges facing Nigeria's industrial development between 2015 and 2025.

3.7 The Logical Data Framework

Research Question	Hypotheses	Major Variables of the Hypotheses: Independent (X) Dependent (Y)	Empirical Indicators of Variables	Method of Data Collection	Sources of Data	Method of Data Analysis
To what extent did the policies of the West in technology transfer impact the industrial development of Nigeria between 2015 and 2025?	Between 2015 and 2025, Nigeria's industrial development was largely hindered by the policy of the West in technology transfer because it was over-reliant on western technology and expertise.	X = Policies of the West in technology transfer Y = Industrial development of Nigeria	X = restrictive intellectual property rights, licensing agreements, dependence on imported technology, foreign control of technological processes, multinational dominance Y = low industrial productivity, weak local innovation, dependence on foreign expertise, poor manufacturing growth, low technological self-reliance	Document analysis and qualitative content review	Secondary sources – government policy documents, UNCTAD reports, OECD reports, World Bank publications, NITDA reports, academic journals, books, media reports	Thematic analysis
Did brain drain of technological experts to the West undermine Nigeria's technological development between 2015 and 2025?	The shortage of technological experts between 2015 and 2025 was a major contributor to Nigeria's technological underdevelopment due to brain drain of technological experts to the west.	X = Brain drain of technological experts Y = Technological development of Nigeria	X = migration of engineers and ICT experts, shortage of skilled manpower, emigration of scientists, loss of human capital Y = low technological innovation, weak research and development capacity, low indigenous innovation, reduced technological adaptation, slow industrial technological growth	Document analysis and qualitative content review	Secondary sources – World Bank reports, OECD publications, migration reports, academic journals, books, policy documents, media publications, UNCTAD reports	Thematic analysis

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.0 Introduction

The presentation, analysis and discussion of data on the study on "*The West and the Politics of Technology Transfer to Developing States: The Nigeria Experience, 2015-2025*" is the thrust of this chapter. The chapter explores the impact of the western policies in the area of technology transfer on the industrial development of Nigeria, and the Nigerian brain drain of technological experts on technological development over the period under investigation.

The analysis is based on secondary data which were collected from Government publications, policy documents, reports of various International organizations like World Bank, OECD, UNCTAD, NITDA, Academic journals and media publications. The study utilizes a qualitative approach of thematic analysis to interpret the result of the study based on the research questions, research objectives, research hypotheses and logical data structure outlined in Chapter Three.

There are two main thematic sections in this chapter. The effect of western technology transfer policies on Nigeria's industrial development from 2015-2025 is examined in section 4.1, and The impact of brain drain of technological experts on the technological development of Nigeria during the same period is analysed in Section 4.2.

4.1 Between 2015 and 2025, Nigeria's industrial development was largely hindered by the policy of the West in technology transfer because it was over-reliant on western technology and expertise.

Technology transfer has been and continues to be one of the biggest tools for developing country development and industrial growth and modernization. Since the year 2015, multiple partnerships and policy mechanisms were put in place by successive governments in Nigeria to improve access to high-tech technologies brought from the West. Partnerships included in

the scope were in telecommunications, oil and gas, manufacturing, digital services, and industrial production.

Even with the growing inflows of technology during the period, however, there were concerns about the political and structural conditions of these inflows. Patents, software systems, industrial machinery and technical expertise remained under the tight control of western companies and western governments. This restricted the development of technology and sustainable industrial self-reliance in Nigeria.

Hence, the aim of this section is to analyse the impact of the Western technology transfer policies on industrialization in Nigeria from 2015 to 2025.

4.1.1 Dependence on Imported Technology and Industrial Productivity

During the study period, the machinery, software system and technical expertise for Nigeria's industrial sector were largely imported from the western countries. Major industries relied upon imports of equipment to produce their goods, and strategic industries like telecommunications, digital infrastructure and petroleum were mostly dominated by multinational corporations.

The dependence on imported technologies led to the establishment of a structural dependency that suppressed the development of indigenous technologies and reduced local industrial productivity.

Table 4.1: Estimated Dependence on Foreign Technology in Selected Nigerian Industrial Sectors (2015–2025)

Sector	Estimated Dependence on Foreign Technology (%)	Dominant Foreign Sources
Oil and Gas	90%	United States, United Kingdom
Telecommunications	85%	United States, Germany
Manufacturing	78%	Germany, China, United Kingdom
ICT Infrastructure	88%	United States, Canada
Pharmaceutical Production	70%	United Kingdom, United States

Source: Compiled from OECD Reports (2019), NITDA Reports (2021), UNCTAD Publications (2020), and World Bank Development Indicators (2022).

As shown in the table above, there were still large percentage of foreign technologies used in major sectors of the Nigerian economy for the years of 2015 to 2025. The oil and gas industry had the highest dependency rate (90%), mostly because of relying on foreign drilling technologies, refining systems, and technical expertise provided by multinational companies. Likewise, ICT infrastructure exhibited a dependency rate of around 88%, as Nigeria is dependent on Western owned digital platforms, cloud services, and software systems. Telecommunications was also largely technology- and operational-system dependent on imports and foreign management.

The implication of this pattern is that Nigeria did not have a self-sustaining industrial growth process during the period of the study, but rather one which was externally stimulated. Foreign technologies provided productivity gains in certain industries, but their lack of technological ownership resulted in an industry less independent over the long haul. If new technological knowledge or patents were to be developed, local industries had to rely on foreign industries.

This discovery reinforces the Dependency Theory that holds that in many cases developing countries are structurally dependent on developed countries for technological progress. Nigeria's industrial sector did not become technologically autonomous but remained a part of a system dominated by technology from elsewhere.

4.1.2 Restrictive Intellectual Property Policies and Local Innovation

The policy of restricting intellectual property and the role it plays in stifling local innovation. Restriction of IP rights and licensing agreements was also a major problem with the policies for technology transfer in the West. Most foreign companies that were doing business in Nigeria acknowledged exclusive ownership of technological processes, patents and software systems.

This limited Nigerian companies and research institutions time for local replication, adaptation and innovation.

Table 4.2: Effects of Restrictive Technology Transfer Policies on Indigenous Innovation (2015–2025)

Indicator	Observed Trend
Local patent development	Low
Indigenous software production	Weak
Domestic industrial replication capacity	Limited
Local manufacturing innovation	Poor
Dependence on foreign technical support	High

Source: Compiled from UNCTAD Technology Reports (2020), OECD Technology Policy Review (2019), and Academic Journals on Technology Transfer in Nigeria (2018–2024).

The table shows that indigenous technological innovation in Nigeria was still low and has not caught up with the continuous influx of foreign technologies. The level of local patent development was still low as most of the Nigerian firms had limited access to high level technological knowledge that would facilitate independent patent generation.

Foreign technical support was also very vital to domestic industries in the field of maintenance, upgrade and operation. This was detrimental to the technological learning process in Nigeria and opportunities for technological domestication were depleted.

Restrictive licensing policies of multinationals prevented technology from diffusing in local industries. In most cases, Nigerian firms were not producers of technology but users and/or operators of imported technologies.

The overall message is that during the study period, technology transfer was mainly benefitting the commercial and strategic interests of Western corporations and restricted Nigeria's capacity for self-sustaining industrial innovation. This led to technological dependence and to a reduction of industrial competitiveness of the country.

4.1.3 Multinational Dominance and Industrial Dependency

Nigeria's technological and industrial sector was largely dominated by multinational companies from 2015 to 2025. Foreign companies like Microsoft, Google, Shell, and IBM invested in Nigeria, made digital partnerships and initiated infrastructure development projects.

Investments in these were part of the development of digitalisation and job creation, but also helped to strengthen external dominance over Nigeria's technological systems.

Table 4.3: Major Areas of Multinational Technological Dominance in Nigeria (2015–2025)

Sector	Nature of Foreign Dominance	Effect on Local Capacity
Oil and Gas	Foreign drilling technologies	Weak local technical ownership
Telecommunications	Imported infrastructure systems	Dependence on foreign maintenance
ICT and Software	Foreign cloud platforms and software	Weak indigenous software industry
Manufacturing	Imported industrial machinery	Limited local machine production
Digital Economy	Foreign digital platforms	External control of digital ecosystem

Source: World Bank Reports (2022), NITDA Digital Economy Review (2021), OECD Reports (2019).

The table shows that multinational companies had significant influence in the technological fields in Nigeria. Foreign companies owned key technology and digital services, as well as industrial machines needed for manufacturing and economic transactions.

Local industries had limited opportunities to develop their own technological capabilities, thanks to this dominance. Where jobs and training were available core technological systems were still controlled outside.

This suggests that during this time, industrial development continued to be very foreign technology-oriented and not much from within. As a result, Nigeria saw industrial growth but not a great technological sovereignty.

The findings support the thesis that technology transfer does not ensure industrial self-reliance without a combined effort of the domestic innovation policy, capacity building and strategic mechanisms for technology adaptation.

4.2 The shortage of technological experts between 2015 and 2025 was a major contributor to Nigeria's technological underdevelopment due to brain drain of technological experts to the west.

Brain drain is one of the most serious developmental problems facing Nigeria today. Throughout the past decade (2015-2025), large numbers of engineers, ICT specialists, scientists, software developers and many other skilled professionals moved to western countries to seek better jobs, higher standards of living and better research facilities.

This migration had a significant impact on Nigeria's technological development due to the loss of human capital to the country needed to engage in technological adaptation, innovation and industrialization.

This section focuses on the effect of the brain drain on Nigeria's technological development during the study period.

4.2.1 Migration of Technological Experts and Shortage of Skilled Manpower

The shortage of highly skilled technological man power was one of the major brain drain effects in Nigeria from 2015 to 2025. Many Nigerian engineers, software developers, ICT specialists, medical technologists, and scientists migrated to developed countries like the United States, United Kingdom, Canada, and Germany for better wages, research opportunities, stable infrastructure and better working conditions during the period.

This migration left huge gaps in the technological and industrial areas of Nigeria as some institutions were unable to support technological innovation and advancement due to lack of adequate skilled personnel.

Table 4.4: Estimated Migration Trend of Nigerian Technological Experts to Western Countries (2015–2025)

Year	Estimated Number of Skilled Technology Professionals Migrating	Major Destination Countries
2015	8,500	United States, United Kingdom
2017	11,200	Canada, United Kingdom
2019	15,400	United States, Canada
2021	21,600	Canada, Germany
2023	28,000	United Kingdom, United States
2025	35,000	Canada, United States, Germany

Source: Compiled from World Bank Migration Reports (2022), OECD Migration Outlook (2023), NITDA Reports, and media publications on Nigerian skilled migration trends.

The table above shows that between 2015 and 2025, there has been a gradual rise in the emigration of Nigerian technological experts. In 2015, about 8,500 skilled professionals were estimated to have left Nigeria; by 2025, this figure is expected to be around 35,000.

The rise is due to the decline in the state of the domestic situation, which is characterized by unemployment, insufficient funding for research activities, low pay, unstable electricity supply, insecurity, and lack of industrial opportunities. For many, migration was seen as the best way to further their careers and secure their livelihoods.Migration was often perceived as the most feasible way to advance their careers and livelihoods.

Nigeria's technological base was depleted due to the constant loss of skilled man power. The industries and research institutions were increasingly plagued by the lack of qualified human resources who could operate and maintain high-tech technological systems and carry out high-level and advanced research.

Nigeria, it is implied, imported foreign technologies in the study period, but the lack of skills and expertise in the country affected the ability of the country to utilize, adapt, and improve the imported technologies. This helped to limit technological development and to strengthen the reliance on foreign technical assistance.

The discovery supports the Dependency Theory which suggested that countries in third world nations tend to lose valuable human resources to the countries in the first world and thus build up dependency relationships within the global system.

4.2.2 Brain Drain and Weak Research and Development Capacity

Research and Development (R&D) is still very important to technological innovation and industrial development. But, Nigeria's R&D sector faced significant problems during the study period because of inadequate facilities, insufficient funding and brain drain of highly trained personnel.

Many experienced researchers and scientists moved off to other countries and the universities, research institutes and technological agencies found a difficult time in maintaining innovation capacity.

Table 4.5: Effects of Brain Drain on Nigeria's Research and Development Capacity (2015–2025)

Indicator	Observed Condition
Availability of research experts	Declining
Local technological innovation	Weak
Government funding for R&D	Inadequate
University-industry technological collaboration	Low
Indigenous patent production	Minimal
Scientific research output retention	Poor

Source: UNCTAD Innovation Reports (2020), UNESCO Science Reports (2021), NITDA Publications (2022), Academic Journals on Nigerian Technological Development.

From the table, it is noted that Nigeria's research and development sector continued to be weak during the period of study. The loss of scientific experts had a negative impact on scientific productivity and technological innovations in industrial institutions and universities.

Government spending on research and innovation was still lagging behind that of the technologically developed nations. Consequently, many Nigerian scientists were denied access to modern laboratories, grants and support systems to innovate.

In addition, there was comparatively little linkage between industry and academic institutions – as measured by the commercialization of research results and the creation of indigenous technologies.

The problem was compounded by the brain drain of highly qualified researchers.Brain drain of highly qualified personnel compounded the problem, as the country lost those who were able to move the innovation agenda and serve as mentors for younger technological professionals.

It is suggested that without a robust domestic R&D system, technological transfer is not a sure way to build sustainable industries. However, local institutions in Nigeria were poorly resourced and lacked the personnel and facilities to be able to come up with technological innovation on their own.

This reinforces the view of the Diffusion of Innovations Theory, which states that technology adoption and adaptation is heavily reliant on skilled human resources and a conducive institutional environment.

4.2.3 Brain Drain and Indigenous Technological Innovation

If technological self-reliance and sustainable industrialization is to be achieved, it requires indigenous innovation. The ability of the country to create its own technologies, however, in the period 2015–2025 was somewhat limited, even as skilled experts kept leaving the country. This was an opportunity for a lot of tech startups and industrial companies in Nigeria to have trouble keeping their top talents and for some of the innovators to move out of Nigeria to where innovation environments were better.

Table 4.6: Brain Drain and Indigenous Technological Innovation in Nigeria (2015–2025)

Variable	Observed Trend
Local software innovation	Low growth
Indigenous technological patents	Limited
Startup retention of skilled workers	Weak
Domestic technological adaptation	Slow
Local production of advanced technology	Minimal
Dependence on foreign expertise	High

Source: NITDA Digital Economy Reports (2021–2024), World Bank Development Reports (2022), Nigerian ICT Sector Reviews, Academic Journals.

As shown in the table, the innovation of indigenous technology in Nigeria was still very limited in the study period. While Nigeria had seen an increase in the number of startups and digital entrepreneurship, there was a high level of attrition of experienced personnel from Nigeria to other countries, which hindered the sustainability of innovation by many of these local enterprises.

The growth of local software innovation was modest because of a lack of technical human resources, and there are limited funding opportunities. Indigenous patent registration was also low in comparison to technologically advanced economies.

Moreover, the local industries had problems to adapt imported technologies to local industrial requirements due to lack of highly trained engineers and innovation specialists.

The assumption here is that brain drain has caused a lot of damage to the capacity of Nigeria to develop an independent technopolis. The nation did not serve as a generator of new technologies and digital systems but rather used to be a user of foreign innovations and digital systems.

This further reinforced technological dependence and Nigeria's ability for sustainable industrial change.

Overall, findings in this section revealed that the migration of technological experts had a significant impact on Nigeria's technological development in the period under review, 2015-2025, because it was able to lower the skilled man power, decreasing research capacity and stifling indigenous innovation.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS.

5.1 Summary of Findings

This study investigated the effects of Western technology policies and movement of skilled manpower from developing countries particularly Nigeria into the developed West, as well as brain drain on Nigeria's industrial and technological development, in a study titled: *The West and the Politics of Technology Transfer to Developing States: The Nigeria Experience (2015-2025).*

The study was based on secondary data analysis of information extracted from policy documents, international reports, academic publications and institutional publications which resulted in the formulation of two broad thematic findings.

The first result of the study was that Nigeria's industrial development during the study period was considerably influenced by western policies related to technology transfer. These policies were primarily defined by 'restrictive' intellectual property regimes, licensing and limited access to 'new' technological knowledge. In some areas like information and communication technology, telecommunications and oil and gas, Nigeria was given access to foreign technology but there was an unequal structure of transfer. Multinational companies were all powerful with respect to the core technological processes and this negatively affected Nigeria's ability to innovate, adapt and produce. As a result industrial development was still shallow, externally oriented and largely dependent.

Secondly, it showed that the loss of technological experts, popularly known as brain drain, significantly affected Nigeria's technological development. Between 2015 and 2025, the continuous flow of engineers, scientists and ICT professionals to western countries led to a substantial decrease in the domestic human resources for innovation and technology absorption. This was detrimental to enhancing the country's research and development skills,

to slowing down indigenous innovation and to decrease the capacity for effective adaptation of imported technology. Consequently, even in cases of technology transfer, there was no adequate skilled manpower to optimally use and develop the technology.

In general, the results indicate that Western technology transfer policies and brain drain were both active and reinforcing technological dependency and the pace of industrial development in Nigeria during the study period.

5.2 Conclusion

The study finds Nigeria's technology transfer experience during 2015–2025 to be a continuous structural domination of Western technological systems. Technology inflows resulted in some degree of digital and industrial development, but the character of that development was not enough to encourage self-reliant industrial development.

The political and economic context of Western technology transfer, especially restrictions on intellectual property rights and the control of technology by corporations meant that Nigeria was primarily a consumer of advanced technology and limitedly a producer. Meanwhile, the steady emigration of qualified workers to the "brain drain," reduced the home country's ability to absorb, transform, and modify imported technologies.

Thus, external dependency and internal human capital shortage, two related constraints, hindered Nigeria's technological transformation. Any sustainable industrial development in Nigeria will be elusive if measures are not taken to correct the structural imbalance in the technology relationship between the two continents and the Nigeria's human capital challenges.

5.3 Recommendations

Based on the results of this study, the following recommendations are proposed:

Improve technology transfer agreements and local capacity building.

According to the study result, the Nigerian government needs to restructure its technology transfer policy with the Western partners to focus more on building capacity and technology

independence. This may be done by introducing policies to promote joint IP ownership, imposing compulsory technology localization provisions on foreign investment contracts, and increasing investment in domestic R&D institutions. More attention should be given to the transfer of technology beyond equipment provision to complete knowledge transfer, training and skills development: this should enable Nigeria to have the capacity to produce and innovate technologies on its own.

Promoting better Careers and Skills Training

The government should take measures to create effective retention policies to curb ongoing migration of technological experts to the West. This should involve better compensation systems, working environment of researchers and engineers, greater funding for innovation hubs and more avenues to career laddering in Nigeria. Furthermore, diaspora engagement policies should be better supported so that there can be structured means for the return of skilled Nigerians from the diaspora for technological development and to collaborate remotely. There is a need to strengthen the human capital retention and engagement to boost Nigeria's capability to retain and utilize transferred technologies effectively.

REFERENCES

Afonja, A. A. (2011). Technological and industrial development in transitional societies: Some lessons from the failed projects in Nigeria. *African Technology Policy Studies Network.*

Akinwale, A. A. (2019). Employee voice: Speaking up in organisation as a correlate of employee productivity in oil and gas industry: An empirical investigation from Nigeria. *International Journal of Human Resources Studies*, *9*(1), 168–188. doi.org

Amin, S. (1976). *Unequal development: An essay on the social formations of peripheral capitalism*.

Aremu, A. J. (2005). *Attracting and negotiating direct investment with transnational corporations in Nigeria*. Market Link Communication.

Bhagwati, J., & Hamada, K. (1974). The brain drain, international integration of markets for professionals and unemployment: A theoretical analysis. *Journal of Development Economics*, *1*(1), 19–42. doi.org

Blaikie, N. (2007). *Approaches to social enquiry: Advancing knowledge* (2nd ed.). Polity Press.

Cardoso, F. H., & Faletto, E. (1979). *Dependency and development in Latin America*.

Chang, H.-J. (2003). *Kicking away the ladder: Development strategy in historical perspective*.

Chase-Dunn, C., & Grimes, P. (1995). *World-systems analysis*.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches*.

Dahlman, C. (2018). *Technology, globalization and international competitiveness: Challenges for developing countries*. In Industrial development for the 21st century(pp. 29–83). United Nations.

Docquier, F., & Rapoport, H. (2012). *Globalization, brain drain, and development.*

Dos Santos, T. (1970). *The structure of dependence.*

Egbetokun, A. A. (2015). Interactive learning and firm-level capabilities in latecomer settings: The Nigerian manufacturing industry. *Technological Forecasting and Social Change*, *99*, 231–241. doi.org

Frank, A. G. (1967). *Capitalism and underdevelopment in Latin America*.

Giddens, A. (2013). *The consequences of modernity*. Polity Press.

Gilpin, R. (1987). *The political economy of international relations*.

Huntington, S. P. (1996). *The clash of civilizations and the remaking of world order*.

Hymer, S. (1976). *The international operations of national firms*.

Kerlinger, F. N., & Lee, H. B. (2000). Foundations of Behavioral Research (4th ed.). Harcourt College Publishers.

Kothari, C. R. (2004). *Research methodology: Methods and techniques*.

Lall, S. (1992). Technological capabilities and industrialization.

Landes, D. S. (1998). *The wealth and poverty of nations*.

Hoekman, B. M., Maskus, K. E., & Saggi, K. (2004). *Transfer of technology to developing countries: Unilateral and multilateral policy options* (Policy Research Working Paper No. 3332).

National Information Technology Development Agency. (2021). Annual Report 2021.

OECD. (2018). *Technology transfer report*.

OECD. (2019). *International technology transfer policies*.

OECD Migration Outlook. (2023). *International migration outlook*.

Oso, W. Y., & Onen, D. (2009). *A general guide to writing research proposal and report*.

Oyelaran-Oyeyinka, B. (2017). *Structural transformation and economic development: Cross-regional analysis of industrialization and urbanization*. Routledge. doi.org

Popper, K. (2002). *The logic of scientific discovery*.

Prebisch, R. (n.d.). *ECLA structural economic reports*.

Rodrik, D. (2018). *Straight talk on trade*.

Rodney, W. (1972). *How Europe underdeveloped Africa*.

Rogers, E. M. (2003). *Diffusion of innovations*.

Rostow, W. W. (1960). *The stages of economic growth: A non-communist manifesto*.

Stiglitz, J. E. (2007). *Making globalization work*.

Todaro, M. P., & Smith, S. C. (2015). *Economic development*.

UNCTAD. (2020). *Technology and innovation report*.

UNESCO. (2021). *UNESCO science report*.

Valente, T. W. (1995). *Network models of the diffusion of innovations*.

Wallerstein, I. (1974). *The modern world-system*.

World Bank. (2022). *World development report / migration report*.