

STRENGTHENING QUALITY HIGHER EDUCATION THROUGH UNIVERSITY-INDUSTRY COLLABORATION IN RIVERS STATE, NIGERIA

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ABSTRACT: This study investigated how university-industry collaboration contributes to quality higher education in Rivers State, Nigeria. Specifically, the study examined the extent to which collaboration in human resource management, physical resource management, financial resource management and stakeholder participation contributes to the enhancement of quality higher education. The study adopted a descriptive survey research design. The population comprised 3,356 academic staff from the three public universities in Rivers State: University of Port Harcourt, Rivers State University, and Ignatius Ajuru University of Education. A sample of 205 academic staff was selected using the Taro Yamane formula, while stratified and simple random sampling techniques were employed in selecting respondents. Data were collected using a researcher-developed instrument titled “University-Industry Collaboration and Quality Higher Education Questionnaire (UICQHEQ)”. The instrument was validated by experts in Educational Management, and a reliability coefficient of .840 was obtained using Cronbach’s Alpha. Mean and standard deviation were used to answer the research questions, while t-test statistics were used to test the hypotheses at the .05 level of significance. The findings from the study revealed that university-industry collaboration in human resource management, physical resource management, financial resource management and stakeholder engagement contributes to the promotion of quality higher education in Rivers State. The study concluded that strengthening partnerships between universities and industries enhances institutional effectiveness, resource availability, staff development and educational outcomes. It was recommended that universities and industries establish sustainable collaborative frameworks to improve the quality and relevance of higher education.

Keywords: University-Industry Collaboration, Quality Higher Education, Human Resource Management, Physical Resource Management, Financial Resource Management, Stakeholders, Rivers State.

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INTRODUCTION

University education play significant role in the socio-economic development of nations by producing skilled manpower, generating new knowledge and promoting innovation. Universities are expected to equip graduates with relevant competencies that meet the demands of the modern day labor market while contributing to national development through research and community service (Altbach & Salmi, 2011; UNESCO, 2022). However, according to Okebukola (2015) and World Bank (2020), the increasing complexities of the global economy and the rapid technological advancement have raised concerns about the quality and relevance of universities, particularly in developing countries such as Nigeria. Consequently, there is growing recognition

that universities cannot effectively achieve their mandates in isolation but must collaborate with industry to enhance educational quality and societal impact (Etzkowitz & Zhou, 2017; OECD, 2019).

University-industry collaboration is the strategic partnership between higher education institutions and industries for the purpose of knowledge exchange, research commercialization, innovation, workforce development and problem-solving (Perkmann et al., 2013; Ankrah & AL-Tabbaa, 2015). These collaborations creates the opportunities for universities to align their curricula with industry needs, expose students to practical experiences and facilitate the transfer of research findings into marketable products and services (Etzkowitz & Leydesdorff, 2000; Yusuf, 2008). Through adequate and coordinated internship programs, joint research initiatives, consultancy services, technology transfer and staff exchanges, universities and industries can jointly contribute to the turning out graduates who possess the required skills and competencies needed in workplace (OECD, 2019; World Economic Forum, 2023).

The quality of higher education is often measured vis-a-vis the relevance of academic programs, graduate employability, research productivity, innovation capacity and stakeholder satisfaction (Materu, 2007; Ololube, 2024). In many Nigerian universities, concerns have been expressed regarding graduate unemployment, inadequate practical training, outdated curricula and limited research utilization; all of these tend to affect the quality of university (NUC, 2021; World Bank, 2020). These challenges emphasize the need for stronger collaboration between universities and industries to bridge the gap between theoretical knowledge and practical application. As such, Ankrah and AL-Tabbaa (2015) and Perkmann et al. (2013) noted that effective university-industry partnerships is able to provide students with experiential learning opportunities, improve curriculum relevance, and enhance the employability of graduates.

Rivers State serves as one of Nigeria's major industrial and economic hubs because of its concentration of oil and gas companies, manufacturing firms, service industries and educational institutions, as such, university-industry collaboration presents significant opportunities towards strengthening higher education quality in the region (Rivers State Government, 2023; Nigerian Upstream Petroleum Regulatory Commission, 2024). The presence of universities such as the University of Port Harcourt, Rivers State University and Ignatius Ajuru University of Education provides a strong foundation for productive engagement with industries operating within the state and beyond (NUC, 2021; Rivers State Government, 2023). Such partnerships are able to facilitate research funding, technological innovation, entrepreneurship development and workforce preparation, which contribute to sustainable economic development and educational excellence (Etzkowitz & Zhou, 2017; OECD, 2019).

Notwithstanding the potential benefits of university-industry collaboration, several challenges continue to hinder its effective implementation in Nigeria and Rivers State in particular. These challenges include inadequate funding, weak institutional frameworks, limited trust between universities and industries, poor commercialization of research outputs and policy inconsistencies (Yusuf, 2008; Okebukola, 2015). In addition, the differences in organizational goals, expectations and operational cultures often impede meaningful collaboration between academic institutions and industrial organizations (Ankrah & AL-Tabbaa, 2015; Perkmann et al., 2013).

Therefore, strengthening quality higher education through university-industry collaboration has become a priority in Rivers State because promoting stronger linkages between universities and industries, higher education institutions might improve teaching, research, innovation and graduate employability while industries benefit from access to research expertise,

technological solutions, and a skilled workforce (Etzkowitz & Zhou, 2017; World Economic Forum, 2023). This study is therefore necessitated by the need to examine how university-industry collaboration contributes to the quality of universities in Rivers State and identify strategies for improving such partnerships.

Statement of the Problem

The quality of higher education in Nigeria has become a major concern among policymakers, educational administrators, employers and other stakeholders because of the persistent mismatch between university graduates' competencies and industry expectations. In spite of the significant role universities play in producing skilled manpower and generating knowledge for national development, many Nigerian graduates continue to face challenges in securing employment because they often lack the practical skills, technological competencies and workplace experiences need for modern day industries. These situations keep raising questions about the effectiveness of the existing university systems abilities in preparing graduates for the demands of the labor market.

In Rivers State, the presence of numerous industries, particularly in the oil and gas, manufacturing and service sectors has the potential to provide enormous opportunities for collaboration with universities. However, observations and evidences suggest that the interactions between universities and industries remain inadequate, which has resulted in limited opportunities for joint research, curriculum development, internship placements, technology transfer and innovation-driven partnerships. As such, many university programs have continued to operate with limited industry input, thereby reducing their relevance to modern workplace requirements.

In addition, the shortage of funding, weak institutional linkages, poor commercialization of research outputs and insufficient policy support have constrained the development of effective university-industry collaborations in Rivers State. To this end, the extent to which university-industry collaboration strengthen quality higher education remains unclear. It is against this background that this study sought to investigate how university-industry collaboration contribute to strengthen quality higher education in Rivers State is investigated.

Aim and Objectives of the Study

The study aimed at examining university-industry collaboration and quality higher education in Rivers State. To achieve this aim, the following objectives were addressed:

- Examine ways university-industry collaborates in human resource management contribute to quality higher education in Rivers State.
- Determine the ways university-industry collaborates in physical resource management contribute to quality higher education in Rivers State.
- Investigate the ways university-industry collaborates in financial resource management contribute to quality higher education in Rivers State.
- Access the extent to which university-industry collaborate stakeholders contribute to quality higher education in Rivers State.

Research Questions

In order to meet the objectives of this study, the following research questions were formulated for the study:

- In what ways does university-industry collaboration collaborate in human resource management contribute to quality higher education in Rivers State?
- In what ways does university-industry collaboration collaborate in physical resource management contribute to quality higher education in Rivers State?
- In what ways does university-industry collaboration collaborate in financial resource management contribute to quality higher education in Rivers State?
- In what ways does university-industry collaboration collaborate in stakeholders involvement contribute to quality higher education in Rivers State?

Hypotheses

- There is no significant difference between the mean ratings of male and female lecturers on the ways university-industry collaborate in human resource management contribute to quality higher education in Rivers State.
- There is no significant difference between the mean ratings of male and female lecturers on the ways university-industry collaborate in physical resource management contribute to quality higher education in Rivers State.
- There is no significant difference between the mean ratings of male and female lecturers on the ways university-industry collaborate in financial resource management contribute to quality higher education in Rivers State.
- There is no significant difference between the mean ratings of male and female lecturers on the university-industry collaboration of stakeholders contribute to quality higher education in Rivers State, Nigeria.

THEORETICAL FRAMEWORK

Triple Helix Theory (THT)

The Triple Helix Theory (THT) was developed by Henry Etzkowitz and Loet Leydesdorff in the mid-1990s as a framework for understanding innovation and knowledge-based economic development through the interaction of universities, industries, and government (Etzkowitz & Leydesdorff, 1995; Etzkowitz & Leydesdorff, 2000). The theory emerged from the recognition that traditional boundaries between these three institutions were becoming increasingly blurred as societies transitioned toward knowledge-driven economies. According to the theory, sustainable development, innovation, and economic growth are achieved when universities, industries and governments collaborate effectively to generate, transfer and apply knowledge for societal benefit (Etzkowitz, 2008; Ranga & Etzkowitz, 2013).

The THT posited that universities are no longer limited to their traditional roles of teaching and research but are also expected to contribute directly to economic and social development through innovation and entrepreneurship (Etzkowitz & Zhou, 2017; Guerrero & Urbano, 2012). Industries, on the other hand, serve as channels for the commercialization and

practical application of knowledge generated by universities. Governments provide the enabling environment through policies, regulations, funding mechanisms, and institutional support that facilitate collaboration among universities and industries (Etzkowitz & Leydesdorff, 2000; Ranga & Etzkowitz, 2013).

A central assumption of the theory is that innovation is most effective when it results from continuous interaction among the three helices. Universities contribute scientific knowledge and research expertise; industries provide market knowledge and resources for commercialization, while governments establish supportive frameworks that encourage partnerships and innovation activities (Etzkowitz, 2008; Leydesdorff, 2012). The collaborative relationship among these actors may actively lead to the creation of new technologies, enhanced research productivity, workforce development and economic competitiveness.

The theory further emphasizes the concept of hybrid organizations and overlapping institutional roles. In modern knowledge economies, universities may engage in entrepreneurial activities such as patenting inventions, creating business incubators, and supporting start-up companies, while industries may participate in research and training initiatives traditionally associated with universities (Etzkowitz & Zhou, 2017; Guerrero & Urbano, 2012). Similarly, governments increasingly act as facilitators of innovation by creating policies that promote university-industry partnerships and knowledge transfer. These overlapping functions strengthen the innovation ecosystem and improve the effectiveness of collaborative efforts.

In higher education, the THT provides a valuable framework for understanding how collaboration between universities and industries can enhance educational quality. Through partnerships with industries, universities gain access to practical knowledge, research funding, technological resources, and opportunities for curriculum improvement (Perkmann et al., 2013; Ankrah & AL-Tabbaa, 2015). Such collaborations enable institutions to align academic programs with labor market needs, thereby improving graduate employability and workforce readiness. Students also benefit from internships, industrial attachments, mentorship programs, and exposure to real-world challenges that complement classroom learning (OECD, 2019; World Economic Forum, 2023).

The relevance of the THT to the present study lies in its explanation of how university-industry collaboration is able to strengthen quality higher education in Rivers State. The theory suggests that stronger interactions between the universities and industries in Rivers State, supported by effective government policies, universities will be able to enhance teaching effectiveness, research productivity, innovation, entrepreneurship development and graduate employability (Etzkowitz & Zhou, 2017; Ranga & Etzkowitz, 2013). Through the provision of a framework for analyzing the extent, influencing factors and challenges of university-industry collaboration, the THT offers an appropriate theoretical foundation for this study because it explains how collaborative partnerships among universities, industries and government contribute significantly to strengthening the quality of higher education to promote sustainable socio-economic development in Rivers State, Nigeria.

CONCEPTUAL REVIEW

University

A university is a higher education institution established for the purpose of teaching, learning, research, and community service. Universities play fundamental roles in the development of

human capital through the provision of advanced knowledge, professional training and opportunities for intellectual growth. Universities serve as centers for the creation, dissemination, and application of knowledge aimed at addressing societal challenges and promoting economic development (Altbach, 2016; UNESCO, 2022). Unlike other higher institutions of learning, universities offer a wide range of academic programs leading to undergraduate and postgraduate degrees across various disciplines (Ololube, 2024).

Historically, university education is regarded as institutions responsible for preserving and transmitting knowledge from one generation to another. However, in contemporary societies, their role has expanded beyond teaching and research to include innovation, entrepreneurship, and engagement with industry and communities (Etzkowitz & Zhou, 2017; Marginson, 2016). Modern universities are saddled with the responsibility to produce graduates who do not only possess theoretical knowledge but also practical skills and competencies required in an increasingly competitive global labor market. According to the World Bank (2020) and Ololube (2024), universities are strategic partners in national development agendas through their contributions to scientific discoveries, technological advancement and workforce preparation.

Universities perform three core functions: teaching, research and community service. Through teaching, they equip students with knowledge, skills and values necessary for personal and professional development. Through research, universities generate new knowledge, promote innovation and provide solutions to societal problems. Community service enables universities to apply their expertise for the benefit of society through outreach programs, consultancy services and partnerships with public and private organizations (Boulton & Lucas, 2008; Altbach, 2016; Ololube, 2024).

In Nigeria, universities are categorized into federal, state and private institutions, all of which contribute to national development through human resource production and knowledge creation. Universities such as the University of Port Harcourt, Rivers State University and Ignatius Ajuru University of Education play significant roles in educational and socio-economic development in Rivers State (National Universities Commission [NUC], 2021).

Industry

Industry refers to a sector of the economy that is involved in the production of goods and services through the utilization of labor, capital, technology, and other resources. It includes wide range of economic activities, including manufacturing, agriculture, construction, mining, telecommunications, banking, healthcare, information technology and oil and gas operations. Industries play significant roles in economic growth by creating employment opportunities, generating income, promoting innovation and contributing to national development (Todaro & Smith, 2021; OECD, 2019). As major stakeholder of economic productivity, industries rely on a skilled workforce and technological advancements to remain competitive in an increasingly globalized economy.

Traditionally, industries are viewed as organizations that are primarily concerned with the production and distribution of goods and services for profit. However, modern industries are increasingly recognized as important stakeholders in knowledge creation, innovation and human capital development (Etzkowitz & Zhou, 2017). The transition to a knowledge-based economy has necessitated stronger relationships between industries and educational institutions, particularly universities, to facilitate the development of skills, research and innovation that address emerging societal and economic challenges (Perkmann et al., 2013).

Industries contribute significantly to workforce development by providing practical training opportunities, internships, apprenticeships, and employment for graduates. Through these activities, they help bridge the gap between theoretical knowledge acquired in educational institutions and the practical competencies required in the workplace (World Economic Forum, 2023; Ankrah & AL-Tabbaa, 2015). In addition, industries often collaborate with universities in research and development projects, curriculum design, technology transfer initiatives, and innovation programs aimed at improving productivity and competitiveness.

The Nigeria industrial community constitute of essential component of national economic development, with sectors such as oil and gas, manufacturing, telecommunications, banking, agriculture, and construction making substantial contributions to the country's gross domestic product (GDP). Rivers State, in particular, hosts numerous industries, especially within the oil and gas sector, making it one of Nigeria's major industrial hubs (Nigerian Upstream Petroleum Regulatory Commission, 2024; Rivers State Government, 2023). The presence of these industries presents significant opportunities for collaboration with universities in areas such as research, innovation, skills development, and graduate employability.

Quality Higher Education

Quality higher education denotes the degree to which university education meets established guidelines, academic standards and effectively achieves its intended goals of teaching, learning, research and community service. It is commonly associated with the ability of higher education institutions to produce competent graduates, generate relevant knowledge, and contribute meaningfully to societal and economic development (Ololube, 2024; UNESCO, 2015). Quality in higher education is not a fixed concept; rather, it is multidimensional and context-dependent, it includes inputs, processes and outcomes within the educational system.

One major dimension of quality higher education is curriculum relevance. High-quality university system guarantees that academic programs align with societal needs and that of the labor market demands. It involves continuous curriculum review, integration of practical skills and incorporation of emerging knowledge areas such as technology and innovation (Materu, 2007). Another dimension to this is teaching and learning effectiveness, which focuses on the competence of lecturers, availability of instructional resources and the use of modern pedagogical approaches that enhance student engagement and understanding (OECD, 2019).

Research productivity and innovation also form key indicators of quality higher education. Universities are expected to contribute new knowledge through research that addresses real-world problems and supports national development (Altbach & Salmi, 2011; World Bank, 2020). In addition, graduate employability is a critical measure of quality, reflecting the extent to which graduates possess the skills, competencies, and attitudes required by employers in both public and private sectors.

Concerns about the declining quality of higher education in Nigeria have been linked to inadequate funding, overcrowded classrooms, insufficient infrastructure, and limited industry engagement (NUC, 2021; Okebukola, 2015). These challenges have contributed to skill gaps among graduates and reduced global competitiveness.

Therefore, quality higher education is central to national development because it shapes human capital, drives innovation and promotes socio-economic transformation. Strengthening its quality ensures that universities meet up with their mandate of producing skilled, competent and globally competitive graduates.

University-Industry Collaboration

University-industry collaboration refers to the strategic partnership between higher education institutions and business organizations, which is aimed at promoting knowledge exchange, innovation, research utilization and workforce development. It includes the establishment of mutually beneficial relationships through which universities and industries share resources, expertise, technologies and information to address societal and economic challenges (Bruneel et al., 2010; D'Este & Patel, 2007). These collaborations have become increasingly important in modern economies where innovation and competitiveness depends largely on the effective integration of academic knowledge and industrial practice.

The growing complexities of technological advancements and labor market demands have made university-industry collaboration an essential component of higher education development. Universities contribute scientific knowledge, research capabilities and skilled graduates, while industries provide practical experience, financial resources and opportunities for the application of research outcomes (Siegel et al., 2003; Santoro & Chakrabarti, 2002). Through these interactions, both parties benefit from enhanced innovation, increased productivity and improved capacity for solving real-world problems.

University-industry collaboration takes several forms, including collaborative research, contract research, consultancy services, industrial training, internship programs, joint curriculum development, technology transfer, and commercialization of research outputs (Philbin, 2008; Scharfing et al., 2002). These activities facilitate the transfer of knowledge between academia and industry, as a result ensure that academic programs remain relevant to current industrial needs. Such partnerships also provide students with opportunities to acquire practical skills and workplace experience that complement classroom learning.

Furthermore, university-industry collaboration contributes significantly to improving the quality of higher education by enhancing teaching effectiveness, promoting innovation, increasing research funding, and improving graduate employability (Lee, 2000; Geuna & Muscio, 2009). In the region of Rivers State, where industries play significant role in economic activities, stronger collaboration between universities and industries can promote technological advancement, entrepreneurship development and sustainable socio-economic growth. Therefore, university-industry collaboration remains an important means towards strengthening the relevance, quality and impact of higher education in contemporary society.

How University-Industry Collaborates in Human Resource Management Contribute to Quality Higher Education in Rivers State

Human Resource Management (HRM) is essentially a component of university-industry collaboration that significantly contributes to the attainment of quality higher education. University-industry collaboration in human resource management (HRM) has become an essential strategy for enhancing the quality of higher education in Rivers State. This form of collaboration involves partnerships between universities and industries in staff training, recruitment, professional development, curriculum enhancement, internship programs, and research capacity building. Universities gain access to industry expertise and resources through partnerships, while industries benefit from a skilled workforce and innovative research outputs. This type of mutual relationship contributes significantly to the improvement of teaching, learning and research in universities (Ololube, 2024).

One of the major ways university-industry collaboration contributes to quality higher education is through the continuous development of academic staff. Industries provide opportunities for lecturers to participate in professional training, workshops, conferences and industrial attachments that expose them to current trends and technological advancements in their respective fields (Brennan & Little, 2006). The exposure enables lecturers to update their knowledge and improve instructional delivery, thereby enhancing students' learning experiences and academic outcomes (Ololube, 2024).

According to Jackson (2015), university-industry collaboration also improves curriculum relevance and responsiveness. Through adequate human resource planning and consultation, industries provide valuable input during curriculum design and review processes (Ololube & Wome, 2025). The benefits of these are that it ensures that academic programs are aligned with labor market demands and emerging industry needs. As a result, graduates acquire practical competencies, technical skills and professional attributes that increase their employability and productivity in the workplace.

Furthermore, collaboration in HRM facilitates students' acquisition of practical experience through internships, industrial training, and work-integrated learning programs. These initiatives allow students to apply theoretical knowledge in real-world settings, develop professional networks, and gain exposure to workplace expectations. Such experiences enhance students' readiness for employment and contribute to the production of competent graduates capable of meeting societal and industrial needs (Smith et al., 2014).

Research development is another important benefit of university-industry collaboration in human resource management. Industries often support universities through funding, mentorship, and collaborative research projects. These partnerships enhance the research capabilities of academic staff and students, leading to the generation of innovative solutions to industrial and societal challenges (Ololube & Wome, 2025). The knowledge produced through collaborative research strengthens the quality and relevance of higher education while promoting regional development (Philbin, 2010).

In addition, university-industry collaboration supports talent identification and workforce development. Most industries assist universities in identifying emerging skill requirements and professional standards, enabling institutions to prepare graduates who are equipped for modern labor markets. Thus, the alignment between educational outcomes and industry expectations improves graduate employability and institutional effectiveness (Yorke, 2006; Ololube, 2024).

Industrial activities are central to economic growth in Rivers State, and effective collaboration in human resource management tend to significantly enhance university quality in the area of promoting staff competence, curriculum relevance, research excellence and graduate employability.

Ways University-Industry Collaborates in Physical Resource Management Contribute to Quality Higher Education in Rivers State

Physical resource management is an important aspect of higher education administration that focuses on the provision, maintenance, utilization and development of physical facilities and infrastructure required for effective teaching, learning, research and community service. In the context of university-industry collaboration in physical resource management, it involves partnerships between higher education institutions and industries in the development, funding, maintenance and upgrading of educational facilities. In Rivers State, such collaborations have is

increasingly important to address infrastructural challenges and improve the quality of higher education.

To Altbach et al. (2019), one significant way university-industry collaboration has contributes to quality higher education is through the provision and upgrading of educational infrastructure. Strategic industries often support universities by funding the construction and renovation of lecture halls, laboratories, workshops, libraries, innovation hubs and information and communication technology (ICT) centers. Modern and well-equipped facilities create conducive learning environments that enhance students' academic performance and improve the effectiveness of teaching and research activities.

University-industry collaboration also facilitates the access to modern equipment and technologies. Many high profile industries donate specialized equipment, laboratory instruments, software applications, and technical facilities to universities to support academic programs and research activities. Such supports have in many ways enabled students and lecturers to gain hands-on experience with modern technologies used in industry, which bridges the gap between academic training and workplace realities (Marginson, 2016).

Furthermore, collaborative management of physical resources promotes effective maintenance and sustainability of educational facilities. Industries often provide technical expertise, maintenance support and professional guidance for managing sophisticated equipment and infrastructure (Ololube, 2024). This partnership ensures that facilities remain functional, safe and efficient for educational purposes, thereby enhancing the overall quality of higher education delivery (UNESCO, 2022).

Another important contribution is the establishment of research and innovation centres. Through collaborative investments, industries and universities can develop specialized research laboratories, technology incubation centres and entrepreneurship hubs. These facilities provide opportunities for students and researchers to engage in innovative projects, product development, and problem-solving activities that address societal and industrial challenges. These initiatives enhance research productivity and strengthen the relevance of higher education to economic development (World Bank, 2020).

University-industry collaboration also supports the development of digital infrastructure. Industries frequently assist universities in expanding internet connectivity, digital libraries, e-learning platforms, and smart classroom technologies. These resources improve access to educational materials, facilitate online learning, and enhance communication among students, lecturers, and researchers. The integration of digital technologies into teaching and learning contributes significantly to educational quality and institutional competitiveness (Bates, 2019).

In addition, collaboration in physical resource management helps universities optimize limited resources through shared facilities and joint investments. Industries may grant universities access to specialized facilities for practical training and research, because it reduces operational costs and maximizing resource utilization. Such partnerships improve educational efficiency and provide students with exposure to real-world industrial environments (Cheta-Maclean et al., 2025). Therefore, university-industry collaboration in physical resource management contributes substantially to quality higher education in Rivers State by improving infrastructure, enhancing access to modern technologies, supporting research and innovation, promoting facility sustainability and strengthening digital learning environments.

Ways University-Industry Collaborates in Financial Resource Management Contribute to Quality Higher Education in Rivers State

Financial resource management is fundamental relevant in the achievement of quality higher education because it ensures the availability, allocation, and efficient utilization of funds necessary for teaching, research, infrastructure development, and institutional growth. University-industry collaboration in financial resource management involves strategic partnerships through which industries provide financial support, investments, grants, scholarships, endowments, and research funding to universities. In Rivers State, where universities face increasing financial pressures due to expanding enrolments and rising operational costs, collaboration with industries has become an important mechanism for enhancing educational quality.

One major way university-industry collaboration contributes to quality higher education is through the provision of research grants and funding. Industries often sponsor research projects that address practical challenges within their sectors. Such financial support enables universities to conduct innovative research, acquire research materials, and disseminate findings that contribute to knowledge creation and economic development (Ololube, 2025). The availability of research funding enhances the quality of academic programs and strengthens institutional research capacity (Slaughter & Rhoades, 2004).

Another important contribution is the sponsorship of scholarships and bursary programmes for students. Through financial partnerships, industries provide educational grants that reduce students' financial burdens and increase access to higher education. Scholarship schemes enable talented but financially disadvantaged students to pursue their academic goals, thereby promoting equity, academic excellence, and human capital development (Johnstone, 2013).

University-industry collaboration also supports staff development through financial assistance for professional training, conferences, workshops, and advanced studies. By investing in the development of academic and non-academic staff, industries contribute to the enhancement of teaching quality, administrative efficiency, and research productivity. Well-trained personnel are better equipped to provide high-quality educational services and respond effectively to emerging educational challenges (Bush & Middlewood, 2013).

Furthermore, industries contribute financially to the establishment and expansion of specialized academic programs. Endowments, donations, and sponsorships help universities introduce new programs, strengthen existing departments, and acquire learning resources required for effective program delivery. Such financial investments improve the relevance and competitiveness of higher education institutions in meeting labor market demands (Hénard & Roseveare, 2012).

Collaboration in financial resource management also facilitates entrepreneurship and innovation development. Industries often provide seed funding, venture capital support, and financial incentives for innovation centres, business incubators, and entrepreneurial initiatives within universities. These investments encourage creativity, innovation, and enterprise development among students and staff, thereby enhancing the practical relevance of higher education and promoting economic growth (Etzkowitz, 2014).

Additionally, university-industry financial partnerships contribute to institutional sustainability by diversifying revenue sources. Dependence on government funding alone often

limits the capacity of universities to achieve their educational objectives. Financial collaboration with industries provides alternative sources of income that support long-term planning, quality assurance initiatives, and continuous institutional improvement (Salmi, 2009).

Therefore, university-industry collaboration in financial resource management significantly contributes to quality higher education in Rivers State by supporting research activities, student scholarships, staff development, programme expansion, innovation initiatives, and institutional sustainability.

The Extent in Which University-Industry Collaborate Stakeholders Contribute to Quality Higher Education in Rivers State

University-industry collaboration is a strategy towards enhancing the quality of higher education through the promotion of partnerships between academic institutions and industries (Ololube, 2025). Stakeholders involved in such collaborations include university administrators, academic staff, students, industry managers, government agencies, professional bodies, alumni associations, and non-governmental organizations. The collective contributions of university-industry significantly influence teaching effectiveness, research productivity, innovation and graduate employability. In Rivers State, where industries oil and gas, manufacturing, maritime services and information technology play prominent roles in economic development, stakeholder participation in university-industry collaboration contributes substantially to the achievement of quality higher education (Cheta-Maclean et al., 2025).

University administrators contribute to quality higher education by establishing policies and frameworks that encourage collaboration with industries. Through strategic planning, partnership agreements and resource mobilization, university management creates opportunities for knowledge exchange, research cooperation and staff development programs. Effective leadership enhances institutional capacity to respond to industry needs and societal expectations (Bryson, 2018).

Academic staff also contribute to collaborative research, consultancy services, curriculum development and professional engagement with industries. Their involvement facilitates the integration of practical industry knowledge into teaching and learning processes, which helps to improve students' acquisition of relevant skills and competencies. Thus, collaborations strengthen the relevance and quality of universities academic programs (Ololube, 2024).

Industry stakeholders contribute to the provision of financial support, internship placements, technical expertise, research funding, and modern technological resources. Through these contributions, industries help universities bridge the gap between theory and practice when enhancing students' readiness for employment (Cheta-Maclean et al., 2025). Industry participation also ensures that university curricula align with current labor market demands and technological developments (Bruneel et al., 2010).

Students contribute to a moderate to high extent through active participation in industrial training, internships, entrepreneurship programmes, and collaborative projects. These experiences enhance their practical knowledge, professional skills, and innovative capabilities, thereby improving educational outcomes and graduate quality (Kolb, 2015).

Government agencies contribute to a high extent by providing regulatory frameworks, funding opportunities, quality assurance mechanisms, and policies that encourage university-industry partnerships. Government support strengthens the sustainability and effectiveness of collaborative initiatives aimed at improving higher education quality (OECD, 2019).

Professional bodies and alumni associations also contribute to facilitate networking opportunities, mentorship programs, accreditation processes and career development initiatives. Their involvement enhances institutional credibility and supports the continuous improvement of educational standards (Ololube, 2024).

Inclusively, university-industry collaboration stakeholders contribute to quality higher education in Rivers State through their roles in policy formulation, resource provision, curriculum enhancement, research development, skills acquisition and innovation promotion. Their collective efforts help universities produce competent graduates, generate relevant knowledge and contribute meaningfully to socioeconomic development (Ololube, 2025).

METHODS

This study adopted a descriptive survey research design to investigate how university-industry collaboration contributes to quality higher education in Rivers State, Nigeria. The descriptive survey design was considered appropriate because it enables the systematic collection, description, and analysis of data concerning the characteristics, opinions, and experiences of a defined population without manipulating any variables.

The population for this study comprised 3,356 academic staff drawn from the three public universities in Rivers State. Specifically, the population consisted of 1,385 academic staff from the University of Port Harcourt (UNIPORT), 1,585 academic staff from Rivers State University (RSU), and 386 academic staff from Ignatius Ajuru University of Education (IAUE).

A sample size of 205 academic staff was determined using the Taro Yamane formula. The sample comprised 110 male lecturers and 95 female lecturers selected from the three public universities in Rivers State. Stratified sampling technique was initially employed to categorize academic staff into male and female strata to ensure adequate representation of both groups. Thereafter, simple random sampling technique was used to select the respondents, thereby providing every member of the population with an equal opportunity of being included in the study.

Data for the study were collected using a researcher-developed questionnaire titled “University-Industry Collaboration and Quality Higher Education Questionnaire (UICQHEQ)”. The instrument consisted of 35-item structured on a four-point modified Likert scale with response options of Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2, and Strongly Disagree (SD) = 1. The criterion mean for decision-making was established at 2.50, obtained by dividing the sum of the scale values by four.

The face and content validity of the instrument were established through expert evaluation. The questionnaire was submitted to three experts from the Department of Educational Management, Ignatius Ajuru University of Education, Nigeria. Copies of the study title, objectives, research questions and hypotheses accompanied the instrument to guide the validation process. The experts critically examined the questionnaire for clarity, relevance, adequacy of content coverage, and appropriateness of the items. Their observations, suggestions, and corrections were incorporated into the final version of the instrument to enhance its validity.

The reliability of the instrument was determined using the test-retest method. The questionnaire was administered to a group of respondents on two separate occasions with an interval of two weeks between the administrations. During the second administration, the items were rearranged to minimize response bias and recall effects. The data obtained were analyzed

using Cronbach's Alpha reliability coefficient, which yielded a reliability index of .840, indicating that the instrument was very reliable to be used for the study.

The researcher, assisted by two trained research assistants, personally administered 300 copies of the questionnaire to respondents across the three public universities in Rivers State through direct hand delivery. This approach ensured a high response rate and effective retrieval of the completed instruments. Out of the 300 copies distributed, 205 were duly completed and returned, representing the sample that was used for data analysis.

Data collected for the study were analyzed using mean and standard deviation to answer the research questions. The criterion mean of 2.50 served as the benchmark for decision-making. The null hypotheses were tested using the independent samples t-test at the .05 level of significance. All statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS), Version 28.

RESULTS

Answer to Research Questions

Research Question 1: In what ways do university-industry collaboration contribute to human resource management for quality higher education in Rivers State?

Table 1: Mean ratings and standard deviation analysis of responses on the ways university-industry collaboration contribute to human resource management for quality higher education

S/N	Items	Male Lecturers = 110		Female Lecturers = 95		Mean Set	Decision
		Mean	SD ₁	Mean	SD ₂		
1.	Contracting private recruitment firms by the government to handle the entire recruitment process of staff can ensure transparency and efficiency in the exercise.	2.44	0.94	2.47	0.96	2.46	Disagree
2.	Incorporating the university-industry collaborator supervisory activities can ensure job performance of staff in the universities.	2.75	0.81	2.88	0.81	2.82	Agree
3.	The collaborative efforts between the university-industry collaborator and the government can transcend to the provision of adequate funds for staff salaries.	2.86	0.73	2.82	0.85	2.84	Agree
4.	Through the collaboration between universities-industry collaborators effective staff development can be ensured.	2.79	0.77	2.67	0.93	2.73	Agree
5.	Effective motivation of the staff can be achieved through University-Industry Collaborator.	2.92	0.70	2.96	0.74	2.94	Agree
Grand Mean		2.75	0.79	2.76	0.86	2.76	Agree

Table 1 showed that the respondents disagree with item 1 that contracting private recruitment firms by the government to handle the entire recruitment process of staff can ensure transparency and efficiency in the exercise and this was because the item had least mean set score of 2.46 and

was below the criterion mean score of 2.50 used for decision-making. However, they agree that incorporating the university-industry collaborator supervisory activities can ensure job performance of staff in the universities. Also, the collaborative efforts between the university-industry collaborator and the government can transcend to the provision of adequate funds for staff salaries. In addition, through the collaboration between universities-industry collaborators effective staff development can be ensured, and effective motivation of the staff can be achieved through university-industry collaborators. However, with the grand mean set score of 2.76, it was shown that the respondents agree with the items raised as the ways university-industry collaboration contribute to human resource management for quality higher education in Rivers State.

Research Question 2: In what ways does university-industry collaboration contribute to physical resource management for quality higher education in Rivers State?

Table 2: Mean ratings and standard deviation analysis of responses on the ways university-industry collaboration contribute to physical resource management for quality higher education

S/N.	Items	Male Lecturers = 110		Female Lecturers = 95		Mean Set	Decision
		Mean	SD ₁	Mean	SD ₂		
6.	The collaborative efforts between the universities-industry collaborators and the government can transcend to the provision of quality and quantity physical resources in the universities.	2.74	0.82	2.78	0.87	2.76	Agree
7.	The synergistic relationship between the universities-industry collaborators and the government can transcend into the renovation of existing school buildings.	2.80	0.76	2.83	0.84	2.82	Agree
8.	A nexus between the government and universities-industry collaborators can lead to construction of new school buildings and other school plants.	2.69	0.88	2.70	0.90	2.70	Agree
9.	Through universities-industry collaboration the safety of the physical facilities can be guaranteed.	2.82	0.77	2.85	0.82	2.84	Agree
10.	The interplay between the universities-industry collaborators and the government can transcend to adequate maintenance of school facilities.	2.80	0.76	2.75	0.88	2.78	Agree
Grand Mean		2.77	0.80	2.78	0.86	2.78	Agree

Table 2 indicated that the respondents agree that the collaborative efforts between the universities-industry collaborators and the government can transcend to the provision of quality and quantity physical resources in the universities, the synergistic relationship between the universities-industry collaborators and the government can transcend into the renovation of existing school buildings, and a nexus between the government and universities-industry collaborators can lead to construction of new school buildings and other school plants. Furthermore, through universities-industry collaboration the safety of the physical facilities can

be guaranteed, and the interplay between the universities-industry collaborators and the government can transcend to adequate maintenance of school facilities. This was because the items had mean values that were above the criterion mean score of 2.50 used for decision making. Also, the grand mean set score of 2.78 implied that the respondents agree with the items listed as the ways university-industry collaboration contribute to physical resource management for quality higher education in Rivers State.

Research Question 3: In what ways does university-industry collaboration contribute to financial resource management for quality higher education in Rivers State?

Table 3: Mean ratings and standard deviation analysis of responses on the ways university-industry collaboration contribute to financial resource management for quality higher education

S/N	Items	Male Lecturer = 110		Female Lecturer = 95		Mean Set	Decision
		Mean	SD ₁	Mean	SD ₂		
11.	Through universities-industry collaborators' collaboration adequate funding of the university education can be ensured.	2.85	0.73	2.81	0.86	2.83	Agree
12.	The universities-industry collaborators through the consent of the public sector can provide loan to the universities to run their programmes.	2.94	0.69	2.96	0.74	2.95	Agree
13.	The universities-industry collaborators can also provide funding through special system of taxation in line with the public sector's good policy provisions on tax.	2.87	0.72	2.92	0.76	2.90	Agree
14.	The universities-industry collaborators can collaborate to provide counterpart funds for financing specific university programmes and projects.	2.86	0.73	2.95	0.73	2.91	Agree
15.	The universities-industry collaborators can collaborate with the public sector to enhance the process of research commercialization as a means of generating funds.	2.73	0.83	2.86	0.81	2.80	Agree
Grand Mean		2.85	0.74	2.90	0.78	2.88	Agree

Table 3 shows the respondents agree that through universities-industry collaborators' collaboration adequate funding of the university education can be ensured, through the consent of the public sector can provide loan to the universities to run their programmes, and can also provide funding through special system of taxation in line with the public sector's good policy provisions on tax. Furthermore, the universities-industry collaborators can collaborate to provide counterpart funds for financing specific university programmes and projects and can collaborate with the public sector to enhance the process of research commercialization as a means of generating funds. However, with the grand mean set score of 2.88, it was shown that the respondents agree with the items raised as the ways university-industry collaboration contribute to financial resource management for quality higher education in Rivers State.

Research Question 4: In what ways do university-industry collaboration contribute to stakeholders' involvement for quality higher education in Rivers State?

Table 4: Mean ratings and standard deviation analysis of responses on the ways university-industry collaboration contribute to stakeholders involvement for quality higher education

S/N	Items	Male Lecturer = 110		Female Lecturers = 95		Mean Set	Decision
		Mean	SD ₁	Mean	SD ₂		
16.	The university-industry collaboration can contribute to stakeholders' involvement by ensuring effective classroom management and control during instruction	2.52	0.63	2.66	0.64	2.59	Agree
17.	Stakeholders through the university-industry collaboration can promote a classroom atmosphere that motivates self-directed and cooperative learning.	2.78	0.75	2.82	0.74	2.80	Agree
18.	The university-industry collaboration through stakeholder's involvement can create a positive leaning environment or climate so that students can actively be involved in learning process to ensure in them, a permanent change in desirable behaviour.	2.80	0.91	2.69	0.73	2.75	Agree
19.	The university-industry collaboration through stakeholder's involvement can encourage a good work ethics and habit.	3.02	0.67	2.76	0.43	2.89	Agree
20.	The university-industry collaboration through stakeholder's involvement can encourage team work, innovation and creativity among students.	2.80	0.83	2.64	0.91	2.72	Agree
Grand Mean		2.78	0.76	2.71	0.69	2.75	Agree

Table 4 shows the respondents agreed that university-industry collaboration can contribute to stakeholders' involvement by ensuring effective classroom management and control during instruction, stakeholders through the university-industry collaboration can promote a classroom atmosphere that motivates self-directed and cooperative learning, the university-industry collaboration through stakeholder's involvement can create a positive leaning environment or climate so that students can actively be involved in learning process to ensure in them, a permanent change in desirable behaviour, the university-industry collaboration through stakeholder's involvement can encourage a good work ethics and habit, and the university-industry collaboration through stakeholder's involvement can encourage team work, innovation and creativity among students. Therefore, with the grand mean set score 2.75, it was shown that the respondents agree with the items raised as the ways university-industry collaboration contribute to stakeholders' involvement for quality higher education in Rivers State.

Test of Hypotheses

Hypothesis One: There is no significant difference on the ways university-industry can collaborate in human resource management for quality higher education in Rivers State.

Table 5: t-test analysis between the mean ratings of male and female lecturers with respect to the ways university - industry can collaborate in human resource management for quality higher education in Rivers State

Gender	N	Mean	SD.	Df.	t-cal.	t-crit	Level of Sig.	Decision
Male	110	2.75	0.79	203	0.16	1.96	.05	Accepted
Female	95	2.76	0.86					

Table 5 revealed that at 203 degrees of freedom and .05 level of significance, the table value of t-crit. of 1.96 was more than the estimated t-cal. value of 0.16 and for this reason the null hypotheses was retained and this means that there was no significant difference between the mean ratings of lecturers on the ways university-industry can collaborate in human resource management for quality higher education in Rivers State.

Hypothesis Two: There is no significant difference on the ways university-industry can collaborate in physical resource management for quality higher education in Rivers State.

Table 6: t-test analysis between the mean ratings of male and female lecturers with respect to the ways university-industry can collaborate in physical resource management for quality higher education in Rivers State.

Gender	N	Mean	SD	Df.	t-cal.	t-crit.	Level of Sig.	Decision
Male	110	2.77	0.80	203	0.16	1.96	.05	Accepted
Female	95	2.78	0.86					

Table 6 indicated that at 203 degrees of freedom and 0.05 level of significance, the table value of t-crit. of 1.96 was more than the estimated t-cal. value of 0.16 and for this reason the null hypotheses was retained and this means that there was no significant difference between the mean ratings of lecturers on the ways university-industry can collaborate in physical resource management for quality higher education in Rivers State.

Hypothesis Three: There is no significant difference on the ways university-industry can collaborate in financial resource management for quality higher education in Rivers State.

Table 7: t-test Analysis between the mean ratings of male and female lecturers with respect to the ways university-industry can collaborate in financial resource management for quality higher education in Rivers State

Gender	N	Mean	SD	Df.	t-cal.	t-crit.	Level of Sig.	Decision
Male	110	2.85	0.74	203	0.89	1.96	.05	Accepted
Female	95	2.90	0.78					

Table 7 suggested that at 203 degrees of freedom and .05 level of significance, the table value of t-crit. of 1.96 was more than the estimated t-cal. value of 0.89 and for this reason, the null hypotheses was retained and this indicated that there was no significant difference between the mean ratings of lecturers on the ways university-industry can collaborate in financial resource management for quality higher education in Rivers State.

Hypothesis Four: There is no significant difference between the mean ratings of male and female lecturers on the university-industry collaboration of stakeholders for quality higher education in Rivers State, Nigeria.

Table 8: t-test analysis between the mean ratings of male and female lecturers with respect to the ways university-industry can collaborate with stakeholders for quality higher education in Rivers State

Gender	N	Mean	SD	Df.	t-cal.	t-crit.	Level of Sig.	Decision
Male	110	2.72	0.85	203	0.89	1.96	.05	Accepted
Female	95	2.64	0.78					

Table 8 suggested that at 203 degrees of freedom and .05 level of significance, the table value of t-crit. of 1.96 was more than the estimated t-cal. value of 0.89 and for this reason, the null hypotheses was retained and this indicated that there was no significant difference between the mean ratings of lecturers on the university-industry collaboration of stakeholders for quality higher education in Rivers State, Nigeria.

DISCUSSION OF FINDINGS

How University-Industry Collaboration Contribute to Human Resource Management for Quality Higher Education

The first finding revealed that contracting private recruitment firms by the government to handle the entire recruitment process of staff can ensure transparency and efficiency in the exercise, incorporating the university-industry collaborator supervisory activities can ensure job performance of staff in the universities, the collaborative efforts between the university-industry collaborators and the government can transcend to the provision of adequate funds for staff salaries, through the collaboration between university-industry collaborators effective staff development can be ensured and effective motivation of the staff can be achieved through university-industry collaboration are the ways university-industry collaborators can collaborate in human resource management for quality higher education. The corresponding test of hypothesis established no significant difference between the mean ratings of male and female lecturers with respect to the ways university-industry collaboration can collaborate in human resource management for quality higher education. The result has the support of Brennan and Little (2006), Smith et al. (2014) and Ololube (2024). The researchers found that university-industry collaborate in human resource management in secondary school administration and delivery. The finding contrast with Adelowo (2017) and Egwu (2016). The researchers found low university-industry collaboration in human resource development in higher education. Their findings may be explained in the fact that a meaningful collaboration between the universities-industry has not been given adequate attention on the part of higher education.

The Ways University-Industry Collaboration Contribute to Physical Resource Management for Quality Higher Education

The second finding showed the following: the collaborative efforts between the university-industry collaborators and the government can transcend to the provision of quality and quantity physical resources in the universities, the synergistic relationship between the university-industry collaborators and the government can transcend into the renovation of existing school buildings, a nexus between the government and university-industry collaborators can lead to construction of new school buildings and other school plants, through university-industry collaboration the safety of the physical facilities can be guaranteed and the interplay between the university-industry collaborators and the government can transcend to adequate maintenance of school facilities as the ways university-industry collaborators can collaborate in physical resource management for quality higher education. Its parallel hypothesis showed no significant difference between the mean scores of male and female lecturers with respect to the ways university-industry collaborators can collaborate in physical resource management for quality higher education. The finding is supported by the study of Marginson (2016) when he found that the university-industry collaborators are involved in the provision of facilities in higher education in Nigerian universities. The result is in consonance with the submission of Altbach et al. (2019) that partnering with the university-industry collaborators will undoubtedly upsurge tremendous opportunities in appropriate provision of adequate (special) learning materials, equipment, facilities as well as infrastructural development so that effective teaching and learning can take place. The finding corroborates World Bank (2020) who stated that since private business, organizations, multinational organizations and industries hire and pay for the skills of certified graduates, their collaboration in financing, provision, security and management of physical facilities will increase the efficiency and management of activities in the university education system. Cheta-Maclean et al. (2025) and Ololube (2024) advocated for university-industry collaboration in the management of school physical facilities because of the inefficiency of the government.

The Ways University-Industry Collaboration Contribute to Financial Resource Management for Quality Higher Education

The third finding indicated the ways university-industry collaborators can collaborate in financial resource management for quality higher education to include: through university-industry collaborators collaboration adequate funding of the university education can be ensured, the university-industry collaborators through the consent of the university-industry collaborators can provide loan to the universities to run their programs, the university-industry collaborators can also provide funding through special system of taxation in line with the university-industry collaborator's good policy provisions on tax, the university-industry collaborators can collaborate to provide counterpart funds for financing specific university programs and projects, and the university-industry collaborators can collaborate with the university-industry collaborators to enhance the process of research commercialization as a means of generating funds. The hypothesis revealed that there is no significant difference between the mean values of male and female lecturers with respect to the ways university-industry collaborators can collaborate in financial resource management for quality higher education in Rivers State,

Nigeria. The finding agrees with Slaughter and Rhoades (2004), Etzkowitz (2014) and Cheta-Maclean et al. (2025) who in their studies found some of the identified items as ways through which the university-industry collaborators collaborate with the government to generate alternative funding in education. The finding lays credence to the submission of Ololube (2024) that the mechanism of university-industry collaborators in the system of financial management works to optimize financial flows on various levels of professional education funded with both budgetary and off budgetary resources and to improve public control for the efficient and appropriate use of education establishments' accumulated budget.

The Extent to which University-Industry Collaboration through Stakeholders Contribute to Quality Higher Education

The fourth finding indicated the ways university-industry collaboration contribute to stakeholder's involvement for quality higher education to include; university-industry collaboration contribute to stakeholders involvement by ensuring effective classroom management and control during instruction, university-industry collaboration promotes a classroom atmosphere that motivates self-directed and cooperative learning, university-industry collaboration create a positive leaning environment or climate where students can actively be involved in learning process to ensure in them, a permanent change in desirable behaviour, university-industry collaboration encourage a good work ethics and habit, and university-industry collaboration encourage team work, innovation and creativity among students. The hypothesis revealed that there is no significant difference between the mean values of male and female lecturers with respect to the ways university-industry collaborators can collaborate stakeholders for quality higher education in Rivers State, Nigeria.

The finding agrees with Bryson (2018), Cheta-Maclean et al. (2025) and Ololube (2024) who in their studies found higher education stands as a fundamental pillar in the development of a nation, and the quality of higher education management is a key determinant of success in cultivating an outstanding human resource pool. In the era of globalization and rapid technological advancement, the challenges confronting higher education institutions are becoming increasingly intricate. The finding lays credence to the submission of Ololube (2025) that the mechanism of university-industry collaborators will address the pressing need for innovative strategies that can enhance the quality of higher education management, with a specific emphasis on human resource development and the critical role of communication. In navigating the complexities of contemporary educational landscapes, these strategies should not only address the current challenges but also be forward-thinking and adaptive to the evolving needs and demands of the globalized world. When innovative management approaches are prioritized, institutions of higher learning can position themselves as dynamic contributors to societal progress, ensuring the production of well-rounded, skilled, and adaptable graduates who are equipped to thrive in the ever-changing landscape of the 21st century.

CONCLUSION

Based on the findings of the study, the conclusion drawn is that university-industry collaborators' collaboration in human resource management, physical resource management, financial resource management and stakeholders guarantee quality higher education through their engagement. Also, in the face of the increasingly complex dynamics of the quality of higher

education, the successful implementation of innovative strategies to enhance the quality of higher education management is crucial. From the investigation, it can be concluded that human resource development, collaboration with industries, the critical role of communication and the utilization of technology are the main pillars that can guide higher education institutions towards greater achievements. The success of these strategies will not only enhance the competitiveness of higher education institutions at the national and international levels but will also make a tangible contribution to the development of high-quality human resources. Students will gain a more holistic and relevant learning experience tailored to the needs of the job market, while faculty and administrative staff will continue to grow and make maximum contributions.

Recommendations

On the basis of the findings, the following recommendations were given:

- The government should strive for a healthy matrimony with the university-industry collaborators' in order to ensure effective human resource management which is a key issue for quality higher education.
- The university-industry collaborators should form a cordial relationship as this would guarantee effective physical resource management which is a vital factor for quality higher education.
- The university-industry collaborators should be proactive to forge meaningful partnership with the government to ensure adequate financial resource management which is a formidable factor for quality higher education.
- The university-industry collaborators should strengthen their effort in reaching out to the management of the various industries in order to share ideas, intellectual property rights and also enlighten them on the different services they can render to them (the industries) in order to boost their level of productivity and in turn, develop the university system.

REFERENCES

- Adelewo, A. (2017). *Public private partnership and management of higher education in Lagos State, Nigeria*. https://www.academia.edu/3770477/Public.Private.Partnership_and_Management_of_Higher_Education_in_Nigeria.
- Altbach, P. G. (2016). *Global perspectives on higher education*. Johns Hopkins University Press.
- Altbach, P. G., & Salmi, J. (2011). *The road to academic excellence: The making of world-class research universities*. World Bank.
- Altbach, P. G., Reisberg, L., & de Wit, H. (2019). *Trends in global higher education: Tracking an academic revolution*. Brill.
- Ankrah, S., & AL-Tabbaa, O. (2015). Universities–industry collaboration: A systematic review. *Scandinavian Journal of Management*, 31(3), 387-408.
- Bates, A. W. (2019). *Teaching in a digital age: Guidelines for designing teaching and learning* (2nd ed.). Tony Bates Associates.
- Boulton, G., & Lucas, C. (2008). *What are universities for?* League of European Research Universities.

- Boyer, E. L. (1996). *The scholarship of engagement*. *Journal of Public Service and Outreach*, 1(1), 1120.
- Brennan, J., & Little, B. (2006). *Towards a strategy for workplace learning*. Higher Education Academy.
- Bruneel, J., D'Este, P., & Salter, A. (2010). Investigating the factors that diminish the barriers to university–industry collaboration. *Research Policy*, 39(7), 858–868.
- Bryson, J. M. (2018). *Strategic planning for public and nonprofit organizations* (5th ed.). Jossey-Bass.
- Bush, T., & Middlewood, D. (2013). *Leading and managing people in education*. Sage Publications.
- Cheta-Maclean, S., Ananyi, S. O., & Ololube, N. P. (2025). Public-private partnership dynamics and the role of institutional leadership in Nigeria's public universities economic development. In N. Baporikar (Ed.), *Public Private Partnership Dynamics for Economic Development* (pp. 289-322). Information Science Reference (an Imprint of IGI Global). DOI: 10.4018/979-8-3693-9153-2.ch014.
- D'Este, P., & Patel, P. (2007). University-industry linkages in the UK: What are the factors underlying the variety of interactions with industry? *Research Policy*, 36(9), 1295-1313.
- Egwu, O. (2016). Public private partnership for quality assurance in higher education in Imo State. *Higher Education*, (1st ed.) (pp. 117-133).
- Etzkowitz, H. (2008). *The Triple Helix: University-industry-government innovation in action*. Routledge.
- Etzkowitz, H. (2014). *The entrepreneurial university wave: From ivory tower to global economic engine*. *Industry and Higher Education*, 28(4), 223–232.
- Etzkowitz, H., & Leydesdorff, L. (1995). The Triple Helix-University-industry-government relations: A laboratory for knowledge-based economic development. *EASST Review*, 14(1), 14-19.
- Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: From National Systems and “Mode 2” to a Triple Helix of university–industry–government relations. *Research Policy*, 29(2), 109-123.
- Etzkowitz, H., & Zhou, C. (2017). *The Triple Helix: University-industry-government innovation and entrepreneurship*. Routledge.
- Geuna, A., & Muscio, A. (2009). The governance of university knowledge transfer: A critical review of the literature. *Minerva*, 47(1), 93-114.
- Guerrero, M., & Urbano, D. (2012). The development of an entrepreneurial university. *The Journal of Technology Transfer*, 37(1), 43-74.
- Harvey, L., & Green, D. (1993). Defining quality. *Assessment and Evaluation in Higher Education*, 18(1), 9–34.
- Hénard, F., & Roseveare, D. (2012). *Fostering quality teaching in higher education: Policies and practices*. OECD Publishing.
- Jackson, D. (2015). Employability skill development in work-integrated learning: Barriers and best practice. *Studies in Higher Education*, 40(2), 350-367.
- Johnstone, D. B. (2013). *Financing higher education: Who should pay?* International Comparative Higher Education Finance and Accessibility Project.
- Kolb, D. A. (2015). *Experiential learning: Experience as the source of learning and development* (2nd ed.). Pearson Education.

- Lee, Y. S. (2000). The sustainability of university-industry research collaboration: An empirical assessment. *The Journal of Technology Transfer*, 25(2), 111-133.
- Leydesdorff, L. (2012). The Triple Helix, Quadruple Helix, and an N-Tuple of helices. *Journal of the Knowledge Economy*, 3(1), 25-35.
- Marginson, S. (2016). *The dream is over: The crisis of Clark Kerr's California idea of higher education*. University of California Press.
- Materu, P. (2007). *Higher education quality assurance in Sub-Saharan Africa*. World Bank.
- National Universities Commission (NUC). (2021). *Annual report on university education in Nigeria*. NUC.
- Nigerian Upstream Petroleum Regulatory Commission. (2024). *Annual report on Nigeria's upstream petroleum sector*. Abuja: NUPRC.
- OECD. (2019). *University-industry collaboration: New evidence and policy options*. OECD Publishing.
- Okebukola, P. (2015). *Towards improving quality in Nigerian universities*. National Universities Commission.
- Ololube, N. P. (2024). *Institutional leadership: Laying the foundation for success*. Pearl Publishers.
- Ololube, N. P. (2025). Public-private partnership dynamics for economic development of Nigeria. In N. Baporikar (Ed.), *Public Private Partnership Dynamics for Economic Development* (pp. 105-130). Information Science Reference (an Imprint of IGI Global). DOI: 10.4018/979-8-3693-9153-2.ch006.
- Ololube, N. P., & Wome, M. O. E. (2025). *Principles of green human resource management: Theory and practice*. Pearl Publishers.
- Perkmann, M., Tartari, V., McKelvey, M., Autio, E., Broström, A., D'Este, P., Fini, R., Geuna, A., Grimaldi, R., Hughes, A., Kitson, M., Krabel, S., Llerena, P., Lissoni, F., Salter, A., & Sobrero, M. (2013). Academic engagement and commercialization: A review of the literature on university-industry relations. *Research Policy*, 42(2), 423-442.
- Philbin, S. P. (2008). Process model for university-industry research collaboration. *European Journal of Innovation Management*, 11(4), 488-521.
- Philbin, S. P. (2010). Developing and managing university-industry research collaborations through a process methodology. *Journal of Research Administration*, 41(3), 51-68.
- Ranga, M., & Etzkowitz, H. (2013). Triple Helix systems: An analytical framework for innovation policy and practice. *Industry and Higher Education*, 27(4), 237-262.
- Rivers State Government. (2023). *Economic development and investment profile of Rivers State*. Port Harcourt: Government Press.
- Salmi, J. (2009). *The challenge of establishing world-class universities*. World Bank Publications.
- Santoro, M. D., & Chakrabarti, A. K. (2002). Firm size and technology centrality in industry-university interactions. *Research Policy*, 31(7), 1163-1180.
- Schartinger, D., Rammer, C., Fischer, M. M., & Fröhlich, J. (2002). Knowledge interactions between universities and industry in Austria: Sectoral patterns and determinants. *Research Policy*, 31(3), 303-328.
- Siegel, D. S., Waldman, D., Atwater, L., & Link, A. (2003). Commercial knowledge transfers from universities to firms. *The Journal of High Technology Management Research*, 14(1), 111-133.

- Slaughter, S., & Rhoades, G. (2004). *Academic capitalism and the new economy: Markets, state, and higher education*. Johns Hopkins University Press.
- Smith, C., Ferns, S., & Russell, L. (2014). The impact of work integrated learning on student work-readiness. *Australian Collaborative Education Network*, 1-28.
- Todaro, M. P., & Smith, S. C. (2021). *Economic development* (13th ed.). Pearson.
- UNESCO. (2015). *Rethinking education: Towards a global common good?* UNESCO Publishing.
- UNESCO. (2022). *Reimagining our futures together: A new social contract for education*. UNESCO Publishing.
- World Bank. (2020). *The changing nature of work and skills development in Africa: Implications for higher education*. World Bank Publications.
- World Bank. (2020). *The future of work in Africa*. World Bank.
- World Bank. (2020). *The future of work in Africa: Harnessing the potential of digital technologies for all*. World Bank.
- World Economic Forum. (2023). *The future of jobs report 2023*. World Economic Forum.
- Yorke, M. (2006). *Employability in higher education: What it is-What it is not*. Higher Education Academy.
- Yusuf, S. (2008). *Intermediating knowledge exchange between universities and businesses*. World Bank.