



INSTITUTION-INDUSTRY COLLABORATION AND TECHNOLOGICAL INNOVATION IN OFFICE MANAGEMENT AND TECHNOLOGY OPTION IN RIVERS STATE UNIVERSITIES

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Abstract

The study investigated Institution-Industry Collaboration and Technological Innovation in Office Management and Technology Option in Business Education in Rivers State Universities. Four specific objectives, research questions and hypotheses respectively were posed to guide the study. Correlational design was adopted for the study. The population of the study comprised forty one lecturers, 30 from Rivers State University and 11 from Ignatius Ajuru University of Education. The entire population was used as sample for the study and census sampling was adopted for the study. The instrument for data collection was self-constructed questionnaire titled Institution-Industry Collaboration and Technology Innovation (IICTI) questionnaire and Office Management and Technology Questionnaire (OMTQ) developed by the researchers and used for data collection. The instrument were validated by two experts in Business Education and one in Measurement and Evaluation, all in the Faculty of Education, Cronbach Alpha method was used to establish the reliability index of 0.88 and 0.80 respectively. Data collected were analysed using Pearson Product Moment Correlation Coefficient (PPMCC) to answer both the research question and hypotheses at 0.05 level of significance. Findings from the study revealed that there is significant relationship between research partnership and technological innovation in Office management and Technology, also there exist a strong relationship between research and development and technological innovation in Office Management and Technology and there is a strong relationship between manpower training and technological innovations in Office Management and Technology. Conclusion drawn from the study was that research, partnership provides consultative services for both institutions of learning and industries. Based on the findings and conclusion, it was recommended among others that there should be effective collaboration between the industries and institutions on research partnership and technological innovation and authorities concern should institute a mechanism that will stimulate effective ways of knowledge transfer between the institutions and the industry that will be beneficial to both parties and including students in the universities.

Keywords: Institution-Industry Collaboration, technological innovation, office management and technology

Introduction

The world is witnessing increasing attention to the importance of innovation in various areas of social life, especially in recent decades. Innovation has always stimulated progress and an important driver of economic productivity, social progress, and human achievement. Therefore, innovations are located at the heart of progress for all units of economic society like companies, industries, sectors, and entire nations (Haar & Ernst, 2016). Innovations refer to the introduction of new ideas that cause changes in a given system. These changes may be educational, scientific or technological that promotes learning. Innovation are simply regarded to be the outcome of skilled labour force, business activity, significant research and development intensity with linkages to the most crucial centers of excellence in the scientific world (Adepoju, Olomu, & Akinwale, 2017). Technological Innovation implies developing new thoughts, items, administrations, and procedures that would improve technology solutions has provided a better lifestyle by improving the standard of living in the area of production. Technological innovation plays an important role in society for satisfying needs, achieving goals, and solving problems of adopters directed to supporting corporate, industrial, economic, and social change for competitive advantage of firms and nations, and improving overall human progress (Coccia 2017c). New technology is driven by inventions of new things and new ways of doing things that are transformed into usable innovations in markets to satisfy needs, achieve goals, solve problems of adopters that take advantage of important opportunities, or to cope with consequential problems/environmental threats (Coccia, 2020c). Technological innovations are the outcome



of a problem-solving activity in a specific research/technological field to achieve and or sustain goals (Coccia, 2017c).

According to Koko and Ajinwo (2022), the rapid evolution of technology and the increasing complexity that comes with its exploding potential explains why adoption of digital instruction in education continues to receive special attention. An E-office is an office that is equipped with modern technologies like computer, projectors, printer, scanner and so on. The continuous advancement in technology has affected Office Management and Technology profession in terms of the quality, speed and accuracy on how office managers perform their responsibilities. Office Management and Technology is now the new name for the former Secretarial Education. In realization of OMT objectives, OMT students ought to be trained to acquire the required skills, attitude and knowledge needed for modern office management. New technologies ought to be effectively utilized in training institutions (Business Education programme inclusive) to match graduates with the current demands of modern office in organizations. Thus, the diversities of these office technologies require the office manager to possess new skills and sub-skills to enable him or her become relevant in the modern office and these skills and competencies can only be acquired during teaching and learning. Therefore, it is pertinent that Office Management and Technology lecturers in Business Education programme ought to up-date themselves on how to apply these new technologies when teaching. Zoom application is a cloud based service which offers Meetings and Webinars and provides content sharing and video conferencing capability. It helps OMT lecturers in Business Education programme to bring their students together in a frictionless environment to get more done. Zoom is the leader in modern enterprise video communications, with an easy, reliable cloud platform for video and audio conferencing, collaboration, chat, and webinars across mobile devices, desktops, telephones and room systems. Zoom application grants OMT lecturers to present the content of their lessons in various ways. For example Zoom's screen sharing can give lecturers a great opportunity to develop students' intercultural skills by sharing engaging materials such as videos and articles, and presentations (Anastasia, 2018).

New technologies and new knowledge are emerging faster than ever, which put firms and nations under pressure to either lead the charge with the use of new technology or settle for playing catch-up. In this regard, an important stream of the innovation literature has focused on innovation collaborations between organizations and has examined how institutions or firms and nations can benefit and prosper from such innovation collaborations. Universities serve as important partners in firms' innovation activities. Traditionally, institutions were connected to the external world through their core function of training students, equipping them with knowledge and preparing them for their future professional responsibilities. In addition, institutions are places where new knowledge is explored, produced, and synthesized. Integration into the technological change and global knowledge economy also requires most industries to undertake continuous refinement of their products, internal systems, workplace practices and marketing strategies, which unfortunately, do not often align with institutional curricula, course organizations and pedagogy in the institution (Boahin, 2018). Under such circumstance, dependence on specialized knowledge or narrowly prescribed skills for specific jobs and roles rather limit transfer of skills and labour mobility. As argued by Mgonja (2017), the capacity of a nation to produce wealth depends increasingly on the investment it undertakes in strengthening the so-called triangle of knowledge which consists of research, education and innovation.

Institution-industry collaborations is believed to provide high labour mobility, innovation and economic growth and development (Draghici, 2016). Collaboration between institutions and industries encourages skills development through education and training, innovation and technology transfer, acquisition and adoption of knowledge and the promotion of entrepreneurship in a form of start-ups and spin-offs (Mgonja, 2017). There are many types of institution-industry collaboration depending on the objectives, scope and institutional arrangement. Collaboration may be more or less intense and may focus on training or research activities. It could be formal such as equity partnerships, contracts, research projects, patent licensing or informal as interaction in conferences and expert groups (Boahin, 2018). It can also take the form of a short term and long-term collaboration. The short term collaboration refers to on-demand problem solving with pre-defined results, and tend to be carried out through contract research, consulting and licensing (Guimo'n, 2017). Long-term collaborations are usually associated with joint projects and public-private partnerships, including privately-funded university institutes or chairs, joint institution research centres and research consortia; often allowing firms to contract for a core set of services or specific deliverables in a flexible manner (Guimo'n, 2017). The success of institutions-industry collaboration hinges on the missions and motivations of each partner. In most universities, key motivation for partnership include improvement of teaching and research, access to funding due to the inadequate



government subvention to universities, reputation enhancement and access to industrial capabilities, empirical data and resources to commercialize research ideas. Others include, securing additional resources to finance programmes of study (adequate equipment and training materials), improving the quality of training programmes and contents, developing potential career pathways for students, facilitating the transition from school to work and promoting continuing access to workers (Cunningham & Go'k, 2017). Research partnership take place when industry enters into partnership with an institutions researcher to carry out projects together. These types of projects include applied research rather than basic research. Tacit academic knowledge becomes codified through research partnership with industry to develop an idea for commercialization. Industry benefit from knowledge that can generate profits and improve the skills of their staff. Institutions can also benefit from various ways, such as increased revenues to fund basic research, access to highly qualified scientists, and research and employment opportunities for students. Adams (2016) viewed that business collaboration with academics is a complement to their own research, stating that interaction with institution-industry collaborative research centers increases spending and the number of granted patent. Caloghirou (2017) asserted that collaboration provides industry with several benefits, namely: to benefit from research synergies that can reduce costs or improve productivity, access additional resources and skills, obtain financing, and finally share the costs of project. Research partnership provides academic consultation as the provision of a service by academics to industries. This service may consist of giving advice, solving a problem, generating or testing new ideas. This is particularly beneficial to institutions as academic consultants generate revenue and build relationships with the business community at the local, national and international levels that not only increase the relevance of the knowledge generated within the university, but also help industrial researchers to enrich their approaches and research questions (Wright, 2017). Cohen (2016) noted that consultation is a channel through which academic research influences industrial project, output of the university in terms of scientific publications and human capital is related to the growth rate of industries.

Institutions play important roles in knowledge transfer, this is because the process of learning and acquisition of new knowledge has been the foundation for most ground-breaking inventions across all spheres of life (De Moortel & Crispeels, 2018). At the institutions level, there are formal and informal relations between institutions, industry and individuals. Different types of knowledge transfer processes require different forms of inter-organizational arrangements between institutions and industry in order to make the transmission and dissemination processes more effective (D'Este & Patel, 2017). Knowledge transfer between institutions and industry takes place through a variety of mechanisms ranging from recruitment of university graduates to personnel exchanges, joint research, contract research, consulting, patents and publications, licensing, spin-off companies, industry-funded laboratories and other facilities and also informal contacts, such as meetings and conferences. Flows of tacit knowledge and informal contacts between industrialists and academics are relevant aspects of institutions–industry interactions (Muscio, 2016).

Institutions are at the front-end of innovation chain, providing new knowledge and ideas, and having important influence on knowledge transfer and technology innovation. Supporting Research and Development in universities will promote knowledge innovation and technology spill overs. The achievements of government-funded projects are highly spill over and diffusion. Many institutions are executing industry-funded Research and Development that has reduced the Research and Development cost and risk (Fiaz, 2018). Manpower training is a learning activity to attain value, knowhow and intelligence that is requisite to realize organizational tasks (Katz, 2020). Training is seen as a useful means of coping with changes fostered by technological innovation; market competition, organizational structuring and most importantly it plays a key role to enhance employee performance. Training also increases the abilities of employee's very effective way by motivating them and converting them in to well organize and well-mannered, that ultimately affects the performance of organization. Training and development are like sharpening manpower skills in order to reflect the trends in technology and other socio-cultural environmental changes of an organization. Technological innovation has provided the locus of control of many human resource training interventions with the capability to move on to others, including the individual workers and work teams. By employing technology, institutions or organizations can provide their employee the needed training and development continuously at any time and any place (Lee, Hsieh, and Chen, 2017). Manpower training in technological innovations is so important because they can be used to facilitate effective teaching, research and records management in higher education Business Education inclusive generally (Odigwe & Owan, 2020).



Statement of the Problem

Institutions of learning are on yearly basis turning out graduates who seems to have little or no employability skills, industries are not accepting these graduates due to inadequate requisite skills, competence and innovative ideas in Office Management and Technology (Nungse; Ugwoke; Ogbuanya & Shetima, 2020). Societal expectation is that industry ought to collaborate with institution of learning to enable both parties work in synergy towards grooming the Office Management and Technology graduates in Business Education programme to acquire the needed technological innovative, skills, and competencies to face the challenge in the current global trends in work places. On the other hand, industries acknowledge the role of institution research in their innovation processes (Boahin, 2018). As a result, institutions in Nigeria and the world over are being inevitably drawn into the modern national policy agenda through research and development programmes and initiatives. The aim is to foster institution–industry collaboration to address graduate employable skills, relevant programmes to the economic growth and development, industrial input into technological innovation to meet labour market needs. Increasingly, the institutions seems to be under constant pressure to deliver research that will directly benefit the innovation system of their national economies through skill development, innovation and technology transfer and the promotion of entrepreneurship (Stellenthin, 2016).

The Institution-Industries Collaboration ought to build skills development of students and the lecturers that would enhance technological innovation of the institutions. Unfortunately, the researchers observed that Institutions Industry Collaboration in Business Education programme in Rivers State is not robust as to improve the technological innovation and lack the capacity to engage more actively and with greater intensity with industry to achieve the desired results in technological innovation in the area of research partnership, knowledge transfer, research and development and manpower training that would enhance technological innovation. It is based on this backdrop that the researchers sought to investigate institution-industry collaboration and technological innovation of Office Management and Technology option in Business Education programme in Rivers State Universities. On this note, the researchers sought to find out the institution-industry collaboration and technological innovation in office management and technology option in Business Education in Rivers State Universities. Also, the researchers determined the relationship between these variables.

Research Questions

The following questions were posed for the study:

1. In what ways does research partnership relate to technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities?
2. In what ways does knowledge transfer relate to technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities?
3. In what ways does research and development relate to technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities?
4. In what ways does manpower training relate to technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities?

Hypotheses

The following null hypotheses were tested in the study at 0.05 level of significance:

1. There is no significant relationship between research partnership and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities.
2. There is no significant relationship between knowledge transfer and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities.
3. There is no significant relationship between research and development and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities.
4. There is no significant relationship between manpower training and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities.



Methodology

This study adopted the correlational research design. This study was carried out in two universities offering Office Management and Technology option in Business Education programme in Rivers State. The population of the study comprised of 41 Lecturers, 30 from Rivers State University (RSU) and 11 from Ignatius Ajuru University of Education (IAUE). The entire population was used as the sample for the study and census sampling was adopted. The instrument used for data collection were 2 titled "Institution-Industry Collaboration and Technological Innovation Questionnaire" (IICTIQ) and "Office Management and Technology Questionnaire" (OMTQ) developed by the researchers and was used for data collection. A 23 item instrument was design to elicit responses from the respondents on Institution-Industry Collaboration while 10 item instrument was also design to elicit the opinion of respondents on Office Management and Technology. The instrument was validated by two experts in Business Education and one Measurement and Evaluation, all in Faculty of Education. Inputs and suggestions from the experts were incorporated into the final design of the instrument. Four points rating scale of strongly agreed to strongly disagreed was adopted. Face and content validation was done. Responses from the respondents on the IICQ were coded and computed using the Cronbach Alpha method and the reliability coefficients of 0.88 for IICQ and 0.80 for OMTQ. Copies of the questionnaire were administered to the respondents through personal contact. Only 33 copies of the questionnaire were retrieved from the respondents and used for the study. Data collected was analysed using Pearson's Product Moment Correlation Coefficient (r). The Pearson's Product Moment Correlation Coefficient was also used to test the null hypotheses at 0.05 level of significance and t-transformation method or t-distribution method was used to test for the significance of the computed correlation coefficient.

Results

The results for the study were presented in the Table as thus:

Research Question 1: How do research partnership relate to technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities?

Table 1: PPMC Analysis between Research Partnership and Technological Innovation in Office Management and Technology Option in Business Education Programme in Rivers State Universities.

Variable	N	$\frac{\sum X}{\sum Y}$	$\frac{\sum X^2}{\sum Y^2}$	$\sum XY$	r_{calc}	Remarks
Research Partnership (X)	33	118.20	369.82	278.23	0.85	High Positive
Technological Innovation in OMT (Y)	33	100.30	278.87			

Source: Field Survey Data, 2023

The analyses from the Table above reveals a correlation value of $r = 0.85$. This value is high and positive, thus indicating that there is high and positive relationship between research partnership and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities. The relationship here being positive indicates a strong positive relationship exist in between research partnership and technological innovation in Office Management and Technology in Rivers State Universities.

Research Question 2: How do knowledge transfer relate to technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities?

Table 2: PPMC Analysis between Knowledge Transfer and Technological Innovation in Office Management and Technology Option in Business Education Programme in Rivers State Universities.

Variable	N	$\frac{\sum X}{\sum Y}$	$\frac{\sum X^2}{\sum Y^2}$	$\sum XY$	r_{calc}	RMKS
Knowledge Transfer (X)	33	108.30	319.53	250.25	0.82	High Positive
Technological Innovation in OMT (Y)	33	100.30	278.87			

Source: Field Survey Data, 2023



There is positive relationship between knowledge transfer and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities. This is revealed from the correlational analyses as summarized in the Table above. Upon analyses of the 41 responses on the relationship between knowledge transfer and technological innovation in Office Management and Technology, a high coefficient value of $r = 0.79$ as attained which obviously suggests that a positive relationship exists between them.

Research Question 3: How do research and development relate to technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities?

Table 3: PPMC Analysis between Research and Development and Technological Innovation in Office Management and Technology Option in Business Education Programme in Rivers State Universities

Variable	N	$\frac{\sum X}{\sum Y}$	$\frac{\sum X^2}{\sum Y^2}$	$\sum XY$	r_{calc}	Remarks
Research and Development (X)	33	129.20	426.34			
Technological Innovation in OMT (Y)	33	100.30	278.87	307.88	0.88	High Positive

Source: Field Survey Data, 2023

Table 3 establishes the relationship between research and development and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities. From the table, it would be observed that the correlation coefficient was $r = 0.88$ which is reasonably high; and positive, indicating a common direction of increase. In other words, there is proportionate increase between research and development and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities.

Research Question 4: How do manpower training relate to technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities?

Table 4: PPMC Analysis between Manpower Training and Technological Innovation in Office Management and Technology Option in Business Education Programme in Rivers State Universities.

Variable	N	$\frac{\sum X}{\sum Y}$	$\frac{\sum X^2}{\sum Y^2}$	$\sum XY$	r_{calc}	Remarks
Manpower Training (X)	33	137.30	468.57			
Technological Innovation in OMT (Y)	33	100.30	278.87	335.01	0.92	Very High Positive

Source: Field Survey Data, 2023

Result from Table 4 shows a correlation coefficient of $r = 0.92$ was obtained upon analysing the relationship between manpower training and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities. A Correlation coefficient as high as 0.92 is an indication of a strong relationship between the variables of interest, moreover the positive value implies the relationship is in the same direction. In this study therefore, the positive correlation value of 0.92 indicates that a strong relationship exists between manpower training and technology innovation in Office Management and Technology option in Business Education programme in Rivers State Universities.

Hypothesis 1: There is no significant relationship between research partnership and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities.



Table 5: t-transformation Analysis between Research Partnership and Technological Innovation in Office Management and Technology Option in Business Education Programme in Rivers State Universities.

Variable	N	$\frac{\sum X}{\sum Y}$	$\frac{\sum X^2}{\sum Y^2}$	$\sum XY$	df	α	r_{calc}	r_{crit}	t_{calc}	t_{crit}	RMKS
Research Partnership (X)	33	118.20	369.82								
Technological Innovation in OMT (Y)	33	100.30	278.87	278.23	39	0.05	0.85	0.09	10.07	2.04	Rejected

Source: Field Survey Data, 2023

The computed correlation value is $r_{calc} = 0.85$ while the critical value is $r_{critical} = 0.09$ a comparison of the two values shows that the computed value is higher than the critical value and is therefore significant. Furthermore, when the computed r-value of 0.85 was transformed to t-value, the computation yielded 10.07 which was also higher than its critical equivalent of 2.04. These values are so high and significant that they cannot be attributed to sampling error. Consequently, the null hypothesis of no significant relationship between research partnership and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities was rejected. In other words, there is significant relationship between the two variables.

Hypothesis 2: There is no significant relationship between knowledge transfer and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities.

Table 6: t-transformation Analysis between Knowledge Transfer and Technological Innovation in Office Management and Technology Option in Business Education Programme in Rivers State Universities.

Variable	N	$\frac{\sum X}{\sum Y}$	$\frac{\sum X^2}{\sum Y^2}$	$\sum XY$	df	α	r_{calc}	r_{crit}	t_{calc}	t_{crit}	Decision
Knowledge Transfer (X)	33	108.30	319.53								
Technological Innovation in OMT (Y)	33	100.30	278.87	250.25	39	0.05	0.82	0.09	8.95	2.04	Rejected

Source: Field Survey Data, 2023

The Table of correlation analysis above shows a positive significant relationship between knowledge transfer and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities. The observed correlation coefficient was found to be 0.82 while the tabulated value was 0.09 at a degree of freedom of 39 and at the 0.05 level of significance. This value of computed $r = 0.82$ is so significant compared to the critical value that it cannot be due to chance therefore, the null hypothesis of no significance relationship between knowledge transfer and technology innovation in Office Management and Technology option in Business Education programme in Rivers State Universities was rejected. However, to further establish the significance of r , the t transform values was computed and found to 8.95 which is also higher when compared to the critical t-value of 2.04; a confirmation of the significance of the correlation coefficient value. Thus, the rejection of the null hypothesis is upheld.

Hypothesis 3: There is no significant relationship between research and development and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities.



Table 7: t-transformation Analysis between Research and Development and Technological Innovation in Office Management and Technology Option in Business Education Programme in Rivers State Universities.

Variable	N	$\frac{\sum X}{\sum Y}$	$\frac{\sum X^2}{\sum Y^2}$	$\sum XY$	df	α	r_{calc}	r_{crit}	t_{calc}	t_{crit}	Decision
Research and Development (X)	33	129.20	426.34								
Technological Innovation in OMT (Y)	33	100.30	278.87	307.88	39	0.05	0.88	0.09	11.57	2.04	Rejected

Source: Field Survey Data, 2023

Table 7. The computed correlation coefficient (r) between research and development and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities and the t-test value for significance of correlation coefficient. From the Table it would be observed that the computed values of $r = (0.88)$ and $t = (11.57)$ and respecting higher than their critical values (ie $t_{cal} = 0.09$ and $t_{crit} = 2.04$). These computed values are higher than their corresponding critical values and therefore too significant to be attributed to chance. Consequently, the null hypothesis no significant relationship is rejected, meaning there is significant positive high relationship between research and development and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities.

Hypothesis 4: There is no significant relationship between manpower training and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities.

Table 8: t-transformation Analysis between Manpower Training and Technological Innovation in Office Management and Technology Option in Business Education Programme in Rivers State Universities.

Variable	N	$\frac{\sum X}{\sum Y}$	$\frac{\sum X^2}{\sum Y^2}$	$\sum XY$	df	α	r_{calc}	r_{crit}	t_{calc}	t_{crit}	Decision
Manpower Training (X)	33	137.30	468.57								
Technological Innovation in OMT (Y)	33	100.30	278.87	335.01	39	0.05	0.92	0.09	14.66	2.04	Rejected

Source: Field Survey Data, 2023

Table 8 showed the computed correlation coefficient and the calculated t value for significance of the correlation and their critical values. From the table, it is clear that the calculated values of r and t are respectively higher than their critical value. The high value of r (0.92) compared to the low critical value (0.09) led to the rejection of the null hypothesis of no significant relationship between manpower training and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities, meaning there is high positive relationship between them. The implication is that manpower training and technology innovation in Office Management and Technology option in Business Education programme in Rivers State Universities. To further confirm the significance of the relationship (ie. the significance of the correlation coefficient) a t-test of significance was conducted based on the value of $r = 0.92$ and was found to be significant [ie. $t_{cal} (14.66) > t_{crit} (2.04)$], thus, the relationship between manpower training and technological innovation in Office Management and Technology is high and positive.

Discussion

The finding of research question one revealed that there is a positive and significant relationship between research partnership and technological innovation in Office Management and Technology option in Business Education programme in Rivers State Universities. The finding of this study is in line with the view of Cohen (2016) who opined that business collaboration with academics is a complement to their own



research, stating that interaction with institution-industry collaborative research centers increases spending and the number of granted patents. Through consultation academic research influences industrial project, output of the institution in terms of scientific publications and human capital is related to the growth rate of industries. In agreement with Cohen, Caloghirou (2017) asserted that collaboration provides industry with several benefits, namely: to benefit from research synergies that can reduce costs or improve productivity, access additional resources and skills, obtain financing, and finally share the costs of project. Research partnership provides academic consultation as the provision of a service by institution to industries. This service may consist of giving advice, solving a problem, generating or testing new ideas. Based on the view of Cohen and Caloghirou, Wright (2017) noted that institution as academic consultants generate revenue and build relationships with the business community at the local, national and international levels that not only increase the relevance of the knowledge generated within the institution, but also help industrial researchers to enrich their approaches and research questions.

The finding in research question two revealed that there is a positive significant relationship between knowledge transfer and technology innovation in Office Management and Technology option in Business Education programme in Rivers State Universities. The finding is in agreement with the view of Muscio (2016) who asserted that knowledge transfer between institutions and industry takes place through a variety of mechanisms ranging from recruitment of university graduates to personnel exchanges, joint research, contract research, consulting, patents and publications, licensing, spin-off companies, industry-funded laboratories and other facilities and also informal contacts, such as meetings and conferences. Flows of tacit knowledge and informal contacts between industrialists and academics are relevant aspects of institution–industry interactions. In agreement with the view of Muscio, De Moortel and Crispeels (2018) opined that institutions play important roles in knowledge transfer, this is because the process of learning and acquisition of new knowledge has been the foundation for most ground-breaking inventions across all spheres of life. In emerging economies, institutions are saddled with the responsibilities of creating new knowledge and working with indigenous industries in effective absorption and adaptation of internationally transferred technologies. Institutions have a third mission that goes beyond their traditional teaching and researching remit, which is to transfer knowledge that supports industrial innovations and facilitates technological changes. The researchers are of the view that knowledge transfer will stimulate industry innovation effort by increasing inputs of the innovation process in Office Management and Technology in Business Education programme in Rivers State Universities.

The finding in research question three showed that there is significant positive high relationship between research and development and technological Innovation in Office Management and Technology in Rivers State Universities. The finding is in agreement with the view of O'Shea (2016) who found that the government research and development funding to institutions will obviously promote knowledge and technology transfer activities, which would be beneficial to cooperation research and development. Supporting research and development in institutions will promote knowledge innovation and technology spillovers. The achievements of government-funded projects are highly spillover and diffusion. Institution funding from government or industries would be conducive to enhancing ability innovation, promote knowledge diffusion and spillover, and thus to foster collaboration Research and Development. Based on the view of O'Shea, Van Pottelsberghe (2017) depicts that government research and development funding for institutions would boost the research and development investment of industry. Many institutions are executing industry-funded research and development that has reduced the research and development cost and risk. Agreeing with O'Shea and Van Pottelsberghe, Fiaz (2018) affirmed that industrial leaders and research and development managers share their development projects with institution researchers and seek out technology collaboration that will enable them to refine their product design and production efficiency. The researchers are of the views that funding is important and necessary in any programme, Business Education inclusive or institutions in Rivers State and so, it is important for industries to assist in funding institutions or programmes in academic institutions to enable them acquire equipment and machines that will enable them teach OMT students effectively for office skills development.

The finding of research question four showed that there is relationship between manpower training and technological innovation in Office Management and Technology option in Business Education and the relationship is high and positive. The finding is in agreement with the views of Osborne and Hammoud (2017) who asserted that training drives greater performance and improves the efficiency of everyone in the organization and ultimately produces organizational performance. Manpower training is an important part of managing industry as they ensure that at all times, the employee possess the right skills and knowledge required for their jobs. Training of manpower therefore ought not to be seen just as a fringe benefit for the individual staff by the organization or an interventionist approach to temporarily solve



organizational problems. In agreement with the view of Osborne and Hammoud, Kapur (2018) opined that through training programmes, those working in the industry and the institution will be able to attain unlimited understanding of strategies to build their strengths in specific areas which would eventually generate technological innovation in the industry. Training programmes are so important to novice in the industry who are unaware of the required performance level in the industry. The researchers are of the view that through manpower training programme, those working in the industry and the institution will be able to attain unlimited understanding of strategies and have requisite knowledge to teach students better than those who would not have opportunities for training.

Conclusion

From the findings of this study, it was concluded that research partnership provides consultative services for both institutions of learning and industries. This service may consist of giving advice, solving a problem, generating or testing new ideas. The institution and industry need synergies in areas like knowledge transfer, research and development and manpower training in developing a cutting edge technological innovation that would enhance productivity in the industries and building the abilities and capabilities of academicians in the institutions.

Recommendations

From the findings of this study, the following recommendations were made:

1. There should be effective collaboration between the industries and institutions on research partnership and technological innovation.
2. The authorities concern should institute a mechanism that will stimulate effective ways of knowledge transfer between the institutions and the industry that will be beneficial to both parties and including students in the universities.
3. There should be a proper procedure between institutions and industries for soliciting for funds in OMT in Business Education programme from government or cooperate bodies in the area of research and development.
4. The authorities should ensure training programmes that will develop the knowledge, abilities and capabilities of their staff including lecturers in Business Education programme teaching OMT option.

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