

UNIVERSITY OF PORT HARCOURT

**“RESEARCH AND DEVELOPMENT;
KEY TO SUSTAINABLE
DEVELOPMENT”**

By

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VALEDICTORY LECTURE SERIES

NO. 11

JANUARY 16, 2018

University of Port Harcourt Press Ltd.,
University of Port Harcourt
Port Harcourt
Nigeria
E-mail: uniport.press@uniport.edu.ng

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VALEDICTORY LECTURE SERIES NO. 11
DELIVERED: 16TH JANUARY, 2018

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Designed, Printed and Bound By UPPL

PROGRAMME

- 1. GUESTS ARE SEATED**
- 2. INTRODUCTION**
- 3. THE VICE-CHANCELLOR'S OPENING REMARKS**
- 4. CITATION**
- 5. THE VALEDICTORY LECTURE**

The lecturer shall remain standing during the citation. She shall step on the rostrum, and deliver her Valedictory Lecture. After the lecture, she shall step towards the Vice-Chancellor, and deliver a copy of the Valedictory Lecture and return to her seat. The Vice-Chancellor shall present the document to the Registrar.

- 6. CLOSING REMARKS BY THE VICE-CHANCELLOR**
- 7. VOTE OF THANKS**
- 8. DEPARTURE**

DEDICATION

To God Almighty, the Alpha and Omega!

ACKNOWLEDGEMENT

To God be the glory! Great things He has done. My gratitude goes to all those whose path I have crossed in this 70 years of my life. Unfortunately, I cannot remember most of them. Without them, I will not have a story to tell. Nevertheless, the ones I remember I will not fail to mention them.

- To my parents, both teachers, disciplinarians and both late, I am sure you are proud of your daughter, even though my father would have wished I was a boy.
- My profound gratitude goes to my younger sister, Mrs. I.B. Harry, the stabilizer, ever ready to give me a helping hand, my confidant and my best friend.
- To my children, Osaki and Omiete, I am ever so proud of you, thank you for being such wonderful people.
- I thank all staff and students of the Department of Biochemistry for your love and support particularly when I was building and nurturing the department.
- All those I worked with in School of Graduate Studies, I say thank you my GSO's, late David Amadi, Dr. D. Charles-Granville and my Admissions Officer, Mrs. Flora Iyagba.
- In the course of our struggle for survival, some of my close friends bowed out but they made such impact on my life, e.g. Prof. Gloria Ola Ibeh, Dr. F.E. Omogbai and Prof. G.E. Ekeke. May their souls rest in Perfect Peace.
- My profound gratitude goes to all my colleagues at the Office of DVC, Research and Development. You were a committed and dedicated crop of persons who contributed to the success of the Office of DVC, R&D. They are as follows:-Mr Nador, Benson Lekie, Mr Barinaaziga Easy Tegbee, Mr Williams Okwara Iroh, Mr Osaretin Paul Otubu, Mrs Acheseomie Ibiene Don Pedro, Miss Stella Ogbumbada, Miss Queen Chinyere Njoku, Mr

Samuel Odogo, Mr Constance Bariwereloo Baleh, Mrs. Otami T. S. Akubom and Mr. Monday Nwidedu.

- My appreciation also goes to all our former VCs, Prof. S. J. S. Cookey, Emeritus Prof. Nimi Briggs, Prof. Don Baridam, Prof. J. A. Ajienka and my brother, Prof. N. E. S. Lale for paving the way for my success.
- I want to thank God for using people like Prof. Chioma Unachukwu, Prof. Okpani, Dr. Kaladada Korubo to keep me in check and alive. I am a testimony that defies medical considerations. I thank all my doctors wherever they are. I was hypertensive, diabetic and underwent 7 times major surgeries, lumbar laminectomy (6 hours surgery), spinal spondylosis (8 hours surgery), two times cancer survivor. Even when I was DVC, R&D, I used to undergo chemotherapy at the Teaching Hospital and return next day to the office and attend Senate meetings.
- My special thanks goes to all those who believed in me to sacrifice time and personal money to attract Africa Centre of Excellence to Uniport, now the happening place. My thanks go to the man who had the vision, Prof. J. A. Ajienka and the executors, Prof. Onyewuchi Akaranta, Prof Ogbonna Joel and Dr. Ebisime Etela. When people have shared vision the sky is their stepping stone.
- I appreciate all of you, my household, associates, business partner Mr Victor Nwabuzor and family.
- My profound gratitude also goes to my soul-mate, my husband Prof Samuel Douglas Abbey who shared the pain and joy with me. You are a wonderful man, men need to study your character and emulate you. Thank you for your love and tolerance.
- I give thanks to all my church members, St. Patricks Anglican Church, Tombia and The Redeemed Christian Church of God,

Promised Land Parish, Port Harcourt and Pastor Bayo Bademosi and family.

- Caleb in the Holy Bible said that at 85 years old he could conquer the mountains because he was just as strong as when he was 40 years old. Like Caleb I can still conquer the mountains.
- Who did this? JESUS! O MY GOD! WAOH!

PROTOCOL

The Vice Chancellor, Sir

Members of the Governing Council here present

Deputy Vice Chancellors

Registrar and other Principal Officers

Provost, College of Health Sciences

Dean, Graduate School

Deans of Faculties

My Fellow Professors and other Academic Colleagues

Directors and Heads of Department

Great Students of Unique UniPort

Friends of the University

Distinguished Ladies and Gentlemen

**Research and Development:
Key to Sustainable Development**

PREAMBLE

It is with deep sense of joy and fulfilment that I stand before you today to deliver a lecture to a mixed audience like you. I remember doing so on 27th April, 2006 when I presented my inaugural lecture No.48 titled “Bridging the Protein Gap with What You Have”. At that time, I was justifying my status as a Professor. Inaugural Lecture affords one the opportunity to share publicly one’s academic achievements, concerns and articulate one’s expectations or aspirations. But today, I have invited you here for a completely different purpose, this time, to announce to you that I am of age to bow out from a tenured position in the University system.

I want to seize this opportunity to thank my predecessor Professor Emmanuel Okogbue Anosike, Professor Emeritus, who in 2006 had the urge to mark his formal end of tenured position as a Professor of Biochemistry in this University with a Valedictory Lecture. According to him the urge was so strong that he requested the then Vice-Chancellor, Professor Don Baridam, the 6th Vice-Chancellor of the University of Port Harcourt for the opportunity to do so and the Vice-Chancellor obliged him. That gave birth to the 1st Valedictory Lecture delivered on 4th November, 2006 titled “Desecration of the Ivory Tower”. That was the beginning of Valedictory Lectures in this University. I will also not fail to inform my revered guests that the Valedictory Lecture emanated from the Department of Biochemistry. The Department has produced many firsts in other areas also, but today’s lecture is not for that.

I want to also thank the Vice-Chancellor, Professor Ndowa Lale for giving me the opportunity to deliver this lecture on my birthday.

WHAT IS A VALEDICTORY LECTURE?

I am sure some of you here may be wondering what all this is about. A Valedictory Lecture gives one the opportunity to reminisce and bare one's mind over issues and experiences – good and bad; especially issues agitating one's mind when one has been in a system for too long. The following questions need to be pondered upon and answered:

- i) What can people learn from the experience?
- ii) What can society benefit from such experience?
- iii) Is there any advice one could leave behind for posterity to reap from?

Mr. Vice-Chancellor Sir, this is the 2nd Valedictory Lecture from the Department of Biochemistry. Actually, some have bowed out through other means while others have done so through what every mortal will face, exiting to face the Creator before 70 years. But thanks be to God, I have been privileged to stand before you and address you.

THE LONG WALK INTO ACADEMICS

Vice-Chancellor Sir, distinguished ladies and gentlemen. I have so much to celebrate today. Firstly, not many people make it to 70 years. Secondly, from my Secondary School days at Archdeacon Crowder Memorial Girl's School (ACMGS) Elelenwo, to University of Ibadan and finally to University of Nottingham, I was splashed with one form of scholarship or the other. That made my walk into the academics less stressful. I neither had problems with school fees nor pocket money.

My serious academic career started from the University of Nottingham. I had a big laboratory to myself and the labs were well equipped. The tendency was to work very long hours as the environment was conducive so I developed passion for research. After my PhD, I had to continue working for a company Imperial Chemical's Industry (ICI) as a postdoctoral research fellow. Little

wonder, when Nigerian Institute of Trypanosomiasis Research (NITR), Kaduna came to Britain on a recruitment exercise, my husband and I were ready to go thinking that the research environment we were exposed to in Britain will be replicated. However, to our dismay, we arrived Nigeria to take up the appointment in Kaduna, spent six months achieving nothing. We were transferred to Vom hoping proper research will be done there since Kaduna was the Administrative Headquarters. We arrived in NITR, Vom, Plateau State with passion and enthusiasm. Again, we were completely deflated and lost steam by the time we had spent six months.

We wrote research proposals on how to carry out the work, and prepared strategic plan. We were actually assigned to work on Onchocerciasis (River Blindness). For a period of one year no chemicals or reagents arrived, let alone equipment. The height of our research was tea break at 11:00am after which we dispersed into Jos or undertook to do whatever we liked to pass the time. Though our achievement in research was not significant, I thank God I had a bouncing baby boy as my research product! What a country! What a waste of knowledge and of human resource.

MY SOJOURN TO PORT HARCOURT

My sojourn would have been to the University of Ibadan (UI) if not for the intervention of my mother, Mrs. Celia Willie Bob-Manuel of blessed memory, who asked if there was no university in Port Harcourt. I had been offered appointment at UI and was on my way to start since it is my Alma mater.

My attention was now diverted to the two universities in Port Harcourt. I attended interview in Rivers State University of Science and Technology (RSUST) and was offered appointment. I took up the appointment for three weeks and moved to the University of Port Harcourt (UniPort). At UniPort, I attended interview in the College of Medicine and Faculty of Science and was

offered appointment in both. Finally, I decided to take up the appointment with the Faculty of Science.

HOW IT ALL STARTED

Vice-Chancellor Sir, I finally took up appointment with the Department of Biochemistry, School of Chemical Sciences on 18th August, 1980. I was immediately appointed Acting Director of Studies in the Department. With the change of the School system to the Faculty system, I was made the first Acting Head of Department of Biochemistry. It was quite a challenging experience but was quickly surmounted due to the cooperation of all the other members of staff. The Department of Biochemistry was noted as a place where peace, harmony, cooperation and mentorship excelled. We had a crop of well behaved staff whether junior or senior that did not give room to indiscipline and unwholesome behaviour.

The Department of Biochemistry was among the first, if not the first to send our students on Industrial Training. The Department harvested very good and confident students after that kind of exposure.

Vice-Chancellor Sir, I could vouch for the integrity of our staff and students up till 2005 before I left the Department for the School of Graduate Studies.

AS DEAN, SCHOOL OF GRADUATE STUDIES

Vice-Chancellor, Sir, my passion for research was rekindled at the School of Graduate Studies. If you can recollect, my interest was dashed by the apathy for research due to lack of funds at NITR, Vom.

I remember when Professor Don Baridam called me about my appointment as Dean, School of Graduate Studies, my immediate reaction was outright rejection. But he did not give up or took it as an offence, rather he challenged me and I took up the challenge. I thank Professor Don Baridam, I hail you for your

administrative prowess, magnanimity and large heart. The result of that challenge is not hidden, there are evidences you can see. The School came out of obscurity to limelight. I make bold to state and without contradiction that the new School of Graduate Studies you see today was as a result of the commitment, dedication and foresightedness of a group of people who were members of the Board and staff between 2005 and 2010. A solid foundation with seasoned policies approved by Senate were laid. I thank my successors for keeping it up and refining where necessary. In actual fact, we were on the verge of turning the University to a Graduate University.

My special thanks goes to Professor Joseph Ajiienka, the then Director of Institute of Petroleum Studies (IPS), who was on the Board, a man of the ‘22nd Century’, but born before his time, for his role in initiating (and editing most) of our numerous publications listed below:

- i) School of Graduate Studies Newsletter
- ii) Book of PhD Research Abstracts
- iii) History of Graduate School
- iv) 25th Anniversary Brochure
- v) Graduate School Monograph Series
- vi) Research Review called Creativity and Innovation
- vii) Alumni Directory
- viii) The Central Final PhD Seminar Research Abstracts (from Volume, 1st in 2006, now Volume, 116th, October 5, 2017); and
- ix) Public Lecture Series.

AS DEPUTY VICE-CHANCELLOR, RESEARCH AND DEVELOPMENT

Mr. Vice-Chancellor Sir, I had stated earlier that my appointment as Dean, School of Graduate Studies rekindled my interest in research.

But when I was elected Deputy Vice-Chancellor, DVC (Research & Development), my interest in research was not only rekindled but re-awakened. The reason for this was basically because such a position had never existed in any Nigerian University, including the premier university, University of Ibadan, of which I am an alumna.

The mandate of the office was:-

- i) To provide overall leadership in developing and promoting research and entrepreneurship in consonance with global best practice.
- ii) Develop our research to meet enterprise at a Technology Park to reap the benefits of commercialization of research output for the benefit of society.

I am privileged to be the first DVC (R&D) in Nigeria. Other Universities have followed suit, for example, University of Ilorin (DVC Research, Technology & innovation) and University of Ibadan (DVC Research, Innovation & Strategic Partnerships).

UNIQUENESS, A TRADITION

The founders of the University of Port Harcourt led by Professor Donald Ekong engraved originality, the willingness to be different through independent thought at its governance and tradition of academic orientation. Professor Donald Ekong in his first formal meeting with his team of academic planners on October 28, 1976 stated as follows:

“The new institution should not be a mere reproduction of the older Universities but should take advantage of the opportunities offered in a new university institution to innovate and make a unique contribution to higher education in this country”

As reported by Alagoa (2012), the first statement of Academic Policy was crafted to create the innovative but short-lived School system. Although, this particular innovation proved to be short lived, the principle of adventure in intellectual pursuit, to dare to do new things has, hopefully, become a part of our academic tradition. He reported that the first set of students admitted to the university recognized this as the distinguished tradition, and chose the slogan and cheer term, **Unique UniPort**. This was not a term created by the founders, but by the students themselves, not to brag, but as an expression of the spirit of adventure, open debate and creativity it implies (Alagoa, 2012, Creativity and Innovation).

Little wonder that the Vision of the University of Port Harcourt is:

“To be ranked among the best Universities in Africa renowned for it’s teaching, research, innovation and knowledge transfer”.

Having given all these background information, I will now focus my discussion on

Research and Development: Key to Sustainable Development

Our country Nigeria has several appellations such as giant of Africa, the largest black nation in Africa, 12th largest producer of petroleum in the world and the 8th largest exporter and has the 10th largest proven reserves but 35% of its population are living under the poverty line. Our nation is still rated as a developing nation. The reason for all these are not too far to decipher. Nigeria has low level of income, inequality, poor health and inadequate education, poor sanitary condition which are the 5 most common traits of developing countries.

A developing country has a slow rate of industrialization and low per capita income. Unemployment and poverty are high including infant mortality rate and birth rate, along with low life expectancy. Instead of generating more income from industrial sector, we generate ours from service sector and even rely on the developed countries for industrial growth. Human Development Index (HDI) statistics rank countries on the basis of their development. The country which is having a high standard of living, high GDP, high child welfare, healthcare, excellent medical, transportation, communication and educational facilities, better housing and living conditions, industrial infrastructure and technological advancement, higher per capita income, increase in life expectancy are known as developed countries. These countries generate more revenue from the industrial sector as compared to service sector as they are having a post-industrial economy.

KEY DIFFERENCES BETWEEN DEVELOPED AND DEVELOPING COUNTRIES

- The countries which are independent and prosperous are known as Developed Countries and those facing the beginning of industrialization are called Developing Countries.
- Developed countries have a high per capita income and GDP as compared to Developing Countries.
- In Developed countries the literacy rate is high, but in developing countries illiteracy rate is high.
- Developed countries have good infrastructure and a better environment in terms of health, safety, which are absent in developing countries.
- Developed countries generate revenue from the industrial sector. Conversely, Developing countries generate revenue from the service sector.

- In Developed countries the standard of living of people is high, while it is moderate in developing countries.
- Resources are effectively and efficiently utilized in Developed countries. On the other hand, proper utilization of resources is not done in developing countries.
- In Developed countries, the birth rate and death rate are low and are regularly recorded, whereas in developing countries both rates are high, it's the reverse.

Having given these facts, let us find out on the internet how many finished industrial products Nigeria can export on a large scale. You will be baffled by the answers you will get. It all boils down to the fact that our country Nigeria has not been pulling its weight. However, a lot of pragmatic efforts are being made now.

Bogoro (2014) stated:

“Where is Nigeria in the international knowledge movement? What level is Science and Technology in our national development? Science and Technology have become important drivers of development which we must accept whether we like it or not. Our nation has 153 universities, several Polytechnics and Colleges of Education and so many Research Institutes which should be breeding grounds for creativity, original thinking and innovation. How much contribution have these institutions made towards the development of their nation? The level of investment by government in innovative research / development and education determine the global competitiveness of their nations. Massive and qualitative human capital development with emphasis on technology and product development are factors responsible for the sustainable economic development of the more advanced

nations of the world with Israel and the so called Asian Tiger Nations as easily the best references in progressive transformation in the last half century. There is no doubting the fact that the catching up process for a country like Nigeria in the globalized economies can only be enhanced by the development of a solid framework for the development and integration of Science and Technology into national development strategies. To achieve this therefore, a deliberate investment in Research and Development (R&D) remains the most potent strategy to join the train of knowledge-intensive development agenda”.

WHY RESEARCH AND DEVELOPMENT?

Research is related to development because its output is expected to have direct effect on humanity. The implication is that if sufficient resources/funds are allocated to scientific research, knowledge will be generated that would percolate into the economy in the form of products and processes.

THE ROLE OF THE UNIVERSITY

Bogoro (2014) reported that Universities inevitably have a key role in scientific research in any country and the reasons for this are obvious. With the advent of new technologies and the recent growth of technology-intensive industries globally, there is a corresponding need for well-trained personnel to catch up with the emerging sophistication. These skilled personnel will have to be produced by the universities, the higher education institutions with libraries, laboratories and highly skilled personnel and have research tradition and orientation.

However, the emphasis of universities in Nigeria and other developing countries is more on the teaching than research and oftentimes, heavy teaching loads of academic staff may negatively affect their concentration on research. Our research is epileptic due

to lack of equipment, and maintenance funding to maintain world class scientific infrastructure and even personnel. Most of the research done in our universities if properly x-rayed are not done locally. Most researches are conducted with research partners and indeed some in the spirit to satisfy the Publish or Perish syndrome synonymous to all universities or higher degree awarding institutions for promotion.

The world is increasingly tending towards globalized knowledge society. And our country Nigeria should not be left behind.

WHAT THEN IS RESEARCH?

Research is defined by Chambers Dictionary as a detailed and careful investigation into some area of study to discover and apply new facts or information.

Wikipedia defines research as involving systematic empirical investigation of quantitative properties and phenomena and their relationships, by asking a narrow question and collecting numerical data to analyze it utilizing statistical methods.

The new facts lead to improvement, creativity and innovation. In my observation, this is where the nation is lacking. Most of the things we do are on lip service and it is one of the reasons our agricultural implement, the hoe has not changed much in form. In our universities, research has not been given the pride of place either. There used to be what was called Senate Research Grant where a paltry sum of money was granted to researchers. That no longer exists. Researchers are encouraged to source for funds nationally and globally. Those who were able to win grants because they have no active unit overseeing their activities, they end by derailing, unable to be accountable. We cannot continue to cut corners, our research must be locally relevant and globally recognized.

The vision of the University of Port Harcourt is “to be ranked among the best universities in Africa renowned for its teaching, research, innovation and knowledge transfer”. Since the inception of this university in 1975, all plans and arrangements have been for impactful teaching and knowledge transfer. UniPort is over 42 years old now and it is time for the goal post to move from teaching in which we are now proficient to research and innovation.

“Major elitist universities, research centres and laboratories are located in such key countries as the USA, Britain, West Germany, France, Soviet Union etc. These nations are the home of most scientific books and journals. They spend the bulk of the World R&D funds. They produce the largest number of patents and their discoveries and innovations dominate the world of science and technology. The research agenda of these countries dominate world research” (Bogoro 2014).

The first university in Nigeria established in 1948, University of Ibadan (UI), is about as old as I am. Nigerian universities have not been able to do a lot of things differently. We cannot expect to do the same thing over and over and expect to see a change. Universities are the driving force for technological development, creativity, innovation, entrepreneurship, commercialization, job creation and prosperity of nations. The answer to our doing things differently, is to focus on research and development. Unfortunately, our research efforts have not been harnessed and coordinated to give us the required result. However, in the few years of my experience as DVC, R&D the evidence was very clear, that it can be done. What is needed is to have an Office of Research and Development or Innovation with clear mandate, having Strategic Research Plan and measurable key Performance Indices. The status of the driver should be in the rank of a Principal Officer hence a DVC in our parlance. One feature common to most of the universities that have excelled in research and development is having a driver at the level of a DVC or Pro Vice-Chancellor in

some UK universities or Vice-President in US universities. In global best practice there is someone directly in-charge of research and development (See Table 1).

TABLE 1: GLOBAL UNIVERSITIES DRIVEN BY DVC R &D OR EQUIVALENT

S/NO.	COUNTRIES	UNIVERSITIES
1.	SOUTH AFRICA	<ul style="list-style-type: none"> • Cape Peninsula University of Technology • University of Cape Town • University of Pretoria • Universiteit Stellenbosch • University of Witwatersrand, Johannesburg • University of Kwazulu – Natal, Durban • Rhodes University Grahamstown • University of Johannesburg, Johannesburg • University of Western Cape, Bellville • Nelson Mandela Metropolitan University, Port Elizabeth
2.	UNITED KINGDOM	<ul style="list-style-type: none"> • University of Warwick • University of York • King’s College, London • University of Oxford • University of Cambridge • Imperial College • Robert Gordon University • Herriot Watt University • University of Nottingham <ul style="list-style-type: none"> ○ Six Pro Vice-Chancellors including one for Development and Alumni Relations and another for Research. • Royal Holloway University • University of London • University of Newcastle upon Tyne

3.	UNITED STATES OF AMERICA	<ul style="list-style-type: none"> • Stanford University • MIT • John Hopkins University • Yale University • Harvard • Columbia • UCLA • Cornell • Princeton
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Other Universities in Africa also have DVC Research such as
 East Africa: University of Nairobi
 West Africa: University of Ghana

WHY RESEARCH

Research is catalyst to poverty eradication, employment generation, wealth creation and national development. The relevance of research in companies and institutions cannot be over-emphasized as evident in the following:-

- 1) Tool for building knowledge and efficient learning.
- 2) Means to understand various issues. Research can shed light on issues we didn't even know existed, and can raise questions we hardly realized even needed asking.
- 3) Many businesses and industries with Science and Engineering processes e.g. agriculture, food and beverage manufacturing, healthcare, computer software, ICT, aerospace, aviation and energy have high Research and Development expenditure because it is critical to product innovation and to improve services.
 Finding out how to make things happen and what could differentiate them from others that offer similar services can raise the company's market value and profitability.
- 4) Research helps people to nurture their potential and achieve goals through various opportunities.

- 5) It plays a crucial role in business success and in thriving national economy.
- 6) Helps secure vantage point over competitors in business.
- 7) A way to prove lies and support truths, to test the validity and reliability of claims or those of others. Fact checking to know that truth is an integral part of research.
- 8) Means to find, gauge and seize opportunities e.g. securing employment, scholarships, training grants, project funding, business collaboration and travelling.
- 9) A seed to love reading, writing, analyzing and sharing valuable information.
- 10) Nourishment and exercise for the mind.

BENEFITS OF RESEARCH

Companies invest in Research and Development for the following reasons:-

- 1) Create new and innovative products.
- 2) Add features to old products.
- 3) Connect various parts of a company's strategy e.g. marketing and cost reduction.
- 4) Research and Development refers to the part of a company's business plan that seeks to gain knowledge to develop, design and enhance that company's products, services, technologies or processes.
- 5) Research and Development allows a company to come up with innovative new products or features that increase market share by giving customers something they have never seen before.
- 6) Although resources must be allocated to Research and Development the innovations gained through this research can actually work to reduce costs through more efficient production processes or more efficient products.

Research and Development strategies let companies create highly effective marketing strategies around releasing a new product or an existing product with new features.

Research and Development can help a company follow or stay ahead of market trends and keep the company relevant.

ADVANTAGES OF RESEARCH AND DEVELOPMENT FOR SMALL BUSINESSES:-

- 1) **Competitive edge**
New intellectual property could be developed for the business with concomitant financial benefit.
- 2) **Collaboration**
Skills, knowledge, facilities, expertise and new ideas would be shared to save cost.
- 3) **Income**
Unique products from successful Research and Development can bring financial benefits to business. Research and Development can also attract potential new investors to the business.
- 4) **Reputation**
Engaging in Research and Development can help you strengthen your brand and reputation.
- 5) **Tax Relief**
You can claim Research and Development tax relief to reduce your company's tax burden.

Funding

Research and Development can have cost implications for small business. It can also offer many opportunities for businesses to seek grants for innovation.

6) **Unique Selling Profit**

Research and Development can help you develop unique products and services which may not be entirely new. It can drive product improvement or innovation within the existing business offering.

INNOVATION

Now let us come to the word Innovation which is engraved in the vision statement of UniPort. What is innovation? I have cited innovation in several aspects of my earlier discussion. Nevertheless, what do I really mean by Innovation. If you check on the Internet you will see over a thousand quotes and definitions of Innovation e.g. “There’s a way to do it, find it” (Thomas Edison, one of USA’s great inventors). I believe this statement depicts the fact that whatever the mind can imagine there is a way to achieve it and that indeed is innovation.

There are many definitions of innovation and we shall look at a few of them.

DEFINITION OF INNOVATION

- i) ‘Innovation is the creation of the new or the re-arranging of the old in a new way’.
(Michael Vance).
- ii) ‘Innovation is the creation of something that improves the way we live our lives’.
(Barack Obama quoted in Business Week’s in Sub-section, p.6 November 2007).

- iii) 'Innovation is executing an idea which addresses a specific challenge and achieves value for both the company and customer'.
- iv) 'Innovation is any idea that adds value'. (Baxter Healthcare – Australia).
- v) 'Innovation is the commercialization of creativity'. (Anonymous).
- vi) 'Innovation is the application of ideas that are novel and useful. Creativity, the ability to generate novel and useful ideas, is the seed of innovation but unless it's applied and scaled it's still just an idea' (David Burkus).

While it is said necessity is the mother of invention, Research and Development is the process or pathway to all inventions. Research and Development is the conceptual phase in the product life cycle while product development is the entire process of designing, creating and marketing new products or existing products with new features.

The development portion which comes after research, is the act of turning the discovered science into a useful product that the company can market and sell.

Companies invest in Research and Development when their product lines become outdated or competitors come with similar or superior products. Research and Development are vital for the sustained growth and success of a company (Tarver, 2015).

Between 1960 and 2010, USA, Japan, UK, France and Germany were the top developed countries with the largest proportion of global industrial companies. In 1960 USA served as the headquarters for about 65% of the world's 250 largest industrial firms and the rest in Europe and Japan. The percentage had fallen by 2010 to 33% of the world's largest industrial companies. Emerging markets such as Brazil, India, China and Mexico have taken up 10%

already. Hungary is also emerging as significant industrial production centre.

However, the developed nations are focused on innovation while the emerging markets are focused more on basic manufacturing production. (Maverick, 2015).

INNOVATION BREEDS INNOVATION

Innovation breeds innovation and this statement is very visible in a country like Germany. Germany is known to lack raw materials, have high labour cost and known for high manufacturing standards. Germany can only gain competitive advantage by permanently generating innovations. In the medium term companies neglecting innovations will hardly be able to economically survive. Innovations remain the impulse for economic growth. Because of the close link between innovation and Research and Development, an increase in Research and Development activities result in innovative products able to stand a chance in global markets. There is sufficient empirical evidence that Research and Development companies are more competitive with their products. They thereby open up growth opportunities for themselves which remain unreachable for companies less involved in Research and Development. The ultimate result is that Research and Development intensive companies are leading in employment and growth.

RESEARCH AS AN ENTERPRISE IN THE KNOWLEDGE ECONOMY

“In the beginning God created the heaven and the earth. And the earth was without form, and void and darkness was upon the face of the deep...” (Gen.1:1-2).

Darkness was upon the surface of the earth, little wonder we in Africa are called the Dark Continent. We have not changed much apart from little ray from the Southern part of Africa. From the pictures, Africa is seen to be in almost total darkness, little or no

productivity and increase in crime wave according to police reports. The pictures support the data for the world indices for poverty level (Fig.1).

THE WORLD AT NIGHT



Fig. 1 – World at Night

HOW DO WE GET OUT OF THIS SCENARIO?

A Chinese Proverb says:- Teach a man how to fish and you feed him for life. But give him fish and you feed him for one day! Changing our mindset is the key. According to Winston Churchill, “The empires of the future are the empires of the mind”.

We are in the Age of Knowledge. And as Francis Bacon declared *Knowledge is Power!* Knowledge transforms! New knowledge is discovered through critical thinking. This is also the Age of Sustainable Development (Jeffery Sachs). Knowledge should be capitalized through creativity and innovation. The Knowledge Economy depends on significant Quality Human Capital trained by Higher Education Institutions such as our universities.

AGE OF KNOWLEDGE

Ajienka (2017) observed that university professors are knowledge workers and they are expected to reap bountiful harvest of rich dividends. Such Professors who are in high demand play in the premier academic leagues. Nations that focus on education, in particular higher education, lead in the global economy, win Nobel Prizes. Such nations play in the billionaire league of Entrepreneurship. Universities that focus on Research and Development play in the premier league of Global Ranking Tables.

He also drew attention to examples of missed opportunities in our universities because of lack of research and development policies and structures as shown in Table 2.

Table 2: Missed Opportunities: Universities without Research and Development Policies and Structures

1	University of Ibadan:	Prof. O. Ofi invented a yam flour machine.
2	University of Port Harcourt:	Late Prof. G. I. Ekeke produced a food supplement for Sickle Cell Anaemia called CIKLAVIT.
3	University of Lagos:	Late Prof. Ayodele Awojobi and his innovative car design when Nigeria changed to right hand drive.
4	University of Nigeria, Nsukka:	Prof. Maurice Iwu and his Pharmaceutical and Nutriceutical Products developed by the Bioresources Development Group (BDG) in the laboratories of International Centre for Ethnomedicine and Drug Development (interCEDD) at Nsukka, IHP – Inter CEDD Health Products.

Many universities in Nigeria had Office of Deputy Vice-Chancellor Academic also overseeing research without the necessary intellectual property policies, structures and infrastructures such as development of research policies, programmes, projects and partnerships with Foundations and industry. The country did not derive the dividends of research, innovation, commercialization and entrepreneurship as well as starting start-ups that normally would have contributed to sustainable development of campus and community.

Let me explain these missed opportunities a bit more. At the University of Ibadan, Dr. Ofi of Mechanical Engineering, Faculty of Technology developed a machine to produce yam flour in the eighties. The university did not benefit from this development because it had no appropriate Intellectual Property Policy framework to make any claims. Dr. Ofi who later became Prof. Ofi and Deputy Vice-Chancellor is now retired and enjoying the benefit of his innovation at the exclusion of the university (Fig.2).

Likewise, Late Prof. Gabriel I. Ekeke of the Department of Biochemistry in University of Port Harcourt developed a food

supplement for managing sickle cell anaemia. This innovation went through WHO scrutiny and was approved to be manufactured as CIKLAVIT, by the pharmaceutical company Neimeth. University of Port Harcourt had no IP Policy and lost out of the benefits as its Big Brother University of Ibadan (UI) (Fig.3).



Slide.1 – Culled from Ajenka (2017)



Slide. 2 – Culled from Ajenka (2017)

IMPACTFUL RESEARCH

For the researchers and their instructors to benefit from their findings they must follow the rules of the game. Hitherto, we had always known that research must be globally recognised and locally relevant. In addition to these, Ajienka (2017) proposed two other complimentary principles in the new knowledge-driven economy: research must be strategically sustainable and extensively collaborative. Thus an impactful research can be measured by the following four fundamental principles:-

i) Globally recognized

The research must address global challenges, published and known worldwide and impactful beyond borders.

ii) Locally relevant

The research must focus on local challenges and contribute to widest public good of peoples, government, industries and organizations.

iii) Strategically sustainable

Contribute to sustainable development of present and future generations in time and space, socially, environmentally, economically and culturally in tune with nature.

iv) Extensively Collaborative through internal and external collaborations and partnerships across disciplines, institutions and countries.

OLD PARADIGM (Publish or Perish)

Our research was structured merely to satisfy the syndrome of “Publish or Perish”. Individuals did whatever they liked and presented papers that at times could not be defended. The “publish or perish” syndrome led to intellectual slavery. The missed

opportunities of research products from the various universities mentioned above attest to the failure of that process. Our universities did not grow in intellectual property rights.

THE NEW PARADIGM (Patent, Publish, Produce)

According to Ajenka (2017), the challenge we have always had is not giving Intellectual Property Rights (IPR) its pride of place. This is one of the reasons our research harvest has been poor and not comparable with universities in developed countries. Therefore, he proposed the new paradigm of *patent-publish-produce*, where IPR will be given its pride of place. The benefit from the new paradigm will be overwhelming, for instance: economic development, wealth creation, employment generation and contribution to sustainable development. The Scholars who follow this paradigm will not perish but gain speedy academic progression and become rich. Their universities will also gain in wealth and stature.

WHAT IS SUSTAINABLE DEVELOPMENT?

Sustainable development, (SD) has been defined in so many ways but the most frequently quoted definition is from **Our Common Future**, also known as Brundtland Report. Sustainable development, SD is development that meets the needs of the present without compromising the ability of future generations to meet their needs.

HUMANITIES TOP TEN PROBLEMS FOR NEXT 50 YEARS

In 2003, the world had a population of 6.3 billion people. It is however projected that by 2050 the world's population will be about 8 – 10 billion people. The top ten challenges for the next ten years will be as follows: energy, water, food, poverty, terrorism and war, disease, access to education, democracy and population.(Richard Smalley, 2003) [Fig.4].



Slide.3 –from Richard Smalley (2003)

In 2003 there were 8 MDG goals. They were not achieved due to the fact that government did not factor universities into finding innovative solutions to the MDGs through research and development. It could also be that our universities as a matter of policy did not factor the MDGs into their Research and Development Strategic Plans. In academic parlance and industry there was lack of home grown indigenous knowledge or solutions. Some of the resultant effects were environmental challenges such as pollution, climate change and unemployment (see slides.4A-4D).

Army of Unemployed: Great Danger!; How many jobs created?



Slide. 4A

Environmental Challenges: Pollution,..Climate Change etc



Slide. 4B



Slide. 4C



Slide.4D

On 25th September, 2015, the 193 countries of the UN General Assembly adopted the 2030 Development Agenda titled “Transforming our World”. The goals were expanded to 17 instead of 8 that were not achieved.

THE GLOBAL SUSTAINABLE DEVELOPMENT GOALS (SDGs)

1. End poverty in all its forms everywhere.
2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
3. Ensure healthy lives and promote well-being for all at all ages.
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
5. Achieve gender equality and empower all women and girls.
6. Ensure availability and sustainable management of water and sanitation for all.
7. Ensure access to affordable, reliable, sustainable and modern energy for all.
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.
10. Reduce inequality within and among countries.
11. Make cities and human settlements inclusive, safe, resilient and sustainable.
12. Ensure sustainable consumption and production patterns.
13. Take urgent action to combat climate change and its impacts.
14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss.

16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
17. Strengthen the means of implementation and revitalize the global partnership for sustainable development.

CHALLENGES IN NIGERIA

There are so many challenges in the nation that will discourage achieving these goals e.g. power supply, infrastructure, corruption, waste, unemployment, militancy and insurgency, crime, kidnapping, water, food, environment, disease, low access to education, democracy, population, tribalism, religious and poverty - many earn below a dollar.

CHALLENGES IN THE UNIVERSITY

The challenges we have in the university include, poor funding, epileptic power supply, inadequate bandwidth for internet and intranet facilities, ill-equipped laboratories, community restiveness, human capital, technology, infrastructural defects ,lack of continuity, crime and kidnapping.

NEVERTHELESS INNOVATION IS KEY

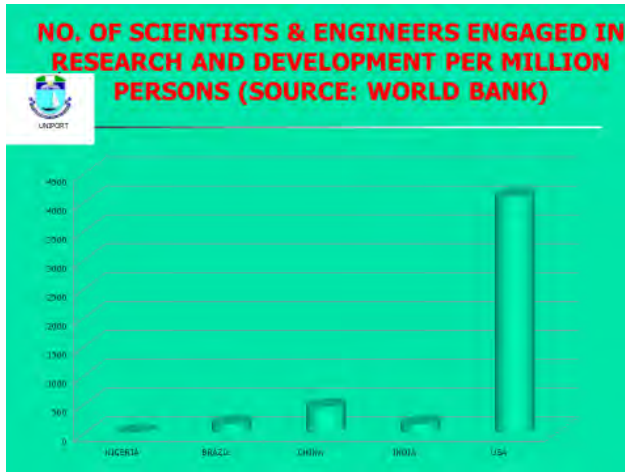
Research is the transformation of Money into knowledge. Innovation is the transformation of knowledge into Money. (Geoffrey Nickelson 3M). Money invested in research yields more money through innovation.

Doing things differently from the way we have been doing them will yield better result.

COUNTRIES ENGAGED IN RESEARCH

Slide 5 shows that Nigeria is only visible in name and not in research. The Education Industry is the mother industry for all

professionals and industries. We should not be dependent on other countries to provide goods and services for us. The time has come for our nation to focus and direct resources to Research and Development and reap the accruing benefits.



Slide. 5 – Culled from *Dosunmu (2015)*

Outcomes/Products of the knowledge Factory in Education Industry

The mission of a university is to teach, conduct research that will impact its community and provide for the community.

Teaching provides quality human capital while Research and Development yield new discoveries, patents, innovative products, new technologies, software solutions, policies, programmes for Knowledge and Technology transfer. Entrepreneurship which is also a product of Research and Development produce licences, start-ups/spin-offs, products to market, royalties, development of innovation commercialization and entrepreneurial ecosystems and secure the future.

In impacting the community, service is provided, community is engaged, job created, wealth created and all are prone to sustainable development. (Adapted from Redwood Sawyer) Slide 6 shows the outcomes or products of the knowledge factory in education industry.



OUTCOMES/PRODUCTS OF THE K-FACTORY IN EDUCATION INDUSTRY

Mission	Outcomes / Products
Teaching & Learning	Quality Human Capital
Research & Development	New Discoveries, Patents, Innovation Products such new technologies, software, processes, policies, Programmes for Knowledge & Technology Transfer
Entrepreneurship	Licenses, Start-ups/Spin-offs, Products to market, Royalties; (Development of ICE Ecosystem); Secure the Future
IMPACT: Community Service/Engagement	Job Creation Wealth Creation Sustainable Development



Adapted from Redwood Sawyer

Slide 6

RESEARCH AND DEVELOPMENT AND UNIVERSITY ADVANCEMENT

Universities that are primarily engaged in Research and Development see it as a way to secure financial independence, the way to sustainable development of school and society and also to individual prosperity, the fundamental way out of economic recession and depression, the way to sustainable Development.

THE PLACE OF EDUCATION TODAY

Today our task is to contribute to the realization of the 17 SDGs on the basis of Education for Sustainable Development and through our Strategic Research and Development Plan. Nations that know the

value of knowledge capital in the global knowledge economy invest heavily in higher education and leaders of such nations have their first, second and third priority as education. Education is key in the emergent knowledge-based economies of the world and is the key that unlocks doors to posterity. Higher education is the master key to creativity, innovation and sustainable development. Tertiary education is distinguished by certification as a meal ticket. Higher education is defined by research, discovery and innovation. According to Olaopa (2016), none of these three indices can be said to define any Nigerian University today.

During the First Annual UniPort Research Fair and Conference with the theme “Optimizing Research and Development for National Transformation” on 18th April, 2012, Engr. Dr. Umar B. Bindir, Director-General and Chief Executive Officer of National Office of Technology Acquisition and Promotion (NOTAP), Federal Ministry of Science and Technology was the guest lecturer who presented a paper on the theme of the conference. He expressed his shocking dismay that after fifty years, universities in Nigeria have not contributed significantly to national innovation and technological development. The reasons he gave were weak innovation policies, drive and infrastructure. There were absence of research policy, intellectual property policy, strategic research plan, patenting office and office for research management. Nigerian academics were contented at publishing papers without the need to transform new knowledge into innovative processes and technologies for the benefit of society as is the practice in developed countries. There was no drive to patent new developments and innovations. What a big waste and loss to Nigeria!

Dr. Bindir went on to state that in 2010 alone Nigerian researchers published about 4,000 articles in peer reviewed journals, yet no Nigerian university was ranked among 5,000 globally, while poverty, power outages, bad roads, accidents etc. continued to plague our society. Development models of key Western and Asian

countries successfully applied research and visionary leadership to transform their countries.

NOTAP's MANDATE

According to Dr Bindir, the following constitute NOTAP's Mandate:

- To evaluate and register Technology Transfer Agreements.
- Monitor the implementation of Technology Transfer Agreements.
- Capacity building of Researchers
- Development of critical mass (Technology Magnets).
- Promotion of Intellectual Property Culture in tertiary institutions.
- Assistance in Patenting Inventions and Research and Development results.
- Promotion and Commercialization of indigenous technology.
- Linking Research and Development with Industry.

He also stated the following Industrial Property Rights and Copyrights:

Industrial Property Rights include Patents, Trade Marks, Industrial Design, Trade Secrets, High Level know-how, Technical Skills and Management Skills.

Copyrights include, Creative Expression – literary, music, software, Databases, Plant varieties, Geographical indicators, Traditional knowledge, Layout Design etc.

THE IMPORTANCE OF RESEARCH IN GLOBAL UNIVERSITY RANKING

The Times Higher Education (THE) World University Rankings are two very important global ranking schemes that judge research-intensive universities across all their core missions namely, teaching,

research, knowledge transfer and international outlook. For the THE, the performance indicators are grouped into five areas:-

- (i) Teaching the learning environment (30%)
- (ii) Research (volume, income and reputation) (30%)
- (iii) Citations (Research Influence) (30%)
- (iv) International outlook Staff, Students and research (2.5%)
- (v) Industry income (knowledge transfer) (7.5%)

1) Teaching, the learning environment (30%)

Reputation survey 15%

- Examines the perceived prestige of institutions in teaching
- Staff student ratio 2.25%
- Doctorates awarded to academic staff ratio giving a sense of how committed an institution is to nurturing the next generation of academics 6%. It is an indicator to take account of a university's unique subject mix reflecting that the volume of doctoral awards varies by discipline.
- Institutional income (2.25%) Measure of income against staff numbers indicates an institution's general status and gives a broad sense of the infrastructure and facilities available to students and staff.

2) Research (volume, income reputation) 30%

- Reputation survey 18%. This evaluates reputation for research excellence among its peers.
- Research income 6% Takes account of each university's distinct subject profile.

- Research productivity 6% Gives a sense of the university's ability to get papers published in quality peer reviewed journals.

3) Citations (research influence): 30%

Looks at university's role in spreading new knowledge and ideas. Research influence is examined by capturing the number of times a university's published work is cited by scholars globally compared with the number of citations a publication of similar type and subject is expected to have. It is one of the most sophisticated indicators in the modern bibliometric toolkit.

The citations help to show us how much each university is contributing to the sum of human knowledge. They tell us where research has stood out, has been picked up and built on by other scholars, and most importantly has been shared around the global scholarly community to expand the boundaries of our understanding irrespective of discipline.

4) International Outlook (Staff, Students, research): 7.5%

- International –to- domestic – student ratio (2.5%)
- International – to – domestic – staff ratio 2.5%
The ability to attract students from all over the world makes a university an international community.
- International collaboration 2.5% The proportion of a university's total research journal publications that has at least one international co-author.

5) Industry Income (knowledge transfer) 2.5%

This is a measure of a university's ability to help industry with innovations, inventions and consultancy. It looks at how much research income an institution earns from industry. It suggests the extent to which businesses are willing to pay for research and a university's ability to attract funding in a commercial market place. This is a useful indicator of institutional quality.

Research has a lot of influence in this ranking exercise. Research is rated 30% and Citation 30%, a total of 60% of the ranking exercise is on Research.

Another top University Ranking Agency is **Qaucquarelli Symonds (QS)**. The universities are evaluated according to six metrics namely:

1. **Academic Reputation (40%)**

Based on Academic Survey regarding teaching and research quality from expert opinion in the higher education space.

2. **Employer Reputation (10%)**

Employers identify those institutions from which they source the more competent, innovative and effective graduates.

3. **Faculty/Student Ratio (20%)**

This measures the extent to which institutions are able to provide students with meaningful access to lecturers and tutors.

4. **Citations per Faculty (20%)**

Institutional research quality is measured here.

5. **International Faculty Ratio (5%)**
Ability to attract faculty and student from across the world indicating having strong international brand.
6. **International Student Ratio (5%)**
Provide students with global awareness.

The QS metric used for the ranking exercise also indicates that research plays a huge role in the exercise. Thus, drawing from Academic Reputation and Citations, a total of 60% of the ranking exercise is drawn from Research, a predominant parameter.

Other top Global Ranking Schemes include, Academic Ranking of World Universities (ARWU) and Webometrics Ranking. They all have Research as predominant factor in their schemes.

THE EMERGENCE OF ENTREPRENEURIAL UNIVERSITY

This is a response to the increasing importance of knowledge in national and regional innovation systems and the recognition that the university is a cost effective and creative inventor and transfer agent of both knowledge and technology. Governments in virtually all parts of the world are focusing on the potential of the university as a resource to enhance innovation environments and create a regime of science based economic development. One model through which we can interpret these changes is that of the Triple Helix (Etzkowitz and Leydesdorf (1998).

Entrepreneurial university is not a trade school designed to train students on how to start or run a commercial activity. Entrepreneurial university is a research intensive university committed to creativity, innovation and commercialization and entrepreneurship for sustainable development of school and society.

CHARACTERISTICS OF ENTREPRENEURIAL UNIVERSITY

Entrepreneurial university is defined by a number of characteristics such as having a strong leadership that develops entrepreneurial capacities for students and staff across its campus. Also, strong ties are built with its external stakeholders that deliver added value including the Alumni. Furthermore, entrepreneurial outcomes that make impact on people and organizations in the region is developed. An entrepreneurial university is known by the knowledge it generates, innovations, inventions, discoveries and breakthroughs capitalized/commercialized into technologies, products and processes for the market place. There is value addition, wealth and employment created to transform society. Here, research meets Business and Enterprise in the Technology Park and Arts Village.

There is innovative learning techniques that encourage effective flow of knowledge between organizations. Multi-disciplinary/Inter-disciplinary approaches to education that mimic real world experience and focus on solving complex world challenges are part of the outcome. There is a drive to promote application of entrepreneurial thinking and leadership.

Financial and Other Benefits Reported by Global Universities

Essien 2013, reported that in 2012, North Carolina State University recorded a total of 806 Intellectual Property and obtained Royalty worth \$1.5billion (See Table 3).

Table 3: North Carolina State University IP 2012 Annual Report

North Carolina State University IP Annual Report 2012 (After Essen, NUC Abuja, Retreat July, 2013)		
No	Item	Quantity
1	Patent Issued	806
2	Patent Pending	248
3	IP Disclosure	3,450
4	Products To Market	230
5	Startup Companies	100
6	Jobs Created	6,800
7	Jobs Created In North Carolina Only	320
8	Royalty	\$1.5 billion
Source		Office of Technology Licensing (OTL)

West (2012) compared the metrics of technology transfer and commercialization by some key US universities as shown in Table 4

Table 4: Comparison of some US University Technology Transfer and Commercialization

University	Invention Disclosures	Patent Applications	Patents Issued	License Agreements	Startups	Program Revenue in Millions
Wisconsin (2010)	350	200	130	61	2	\$86.0
Princeton (2009)	77	107	38	33	N/A	\$65.6
Stanford (2009)	443	N/A	N/A	77	9	\$65.1
MIT (2010)	530	184	166	57	16	\$60.1
Washington (2009)	349	262	40	220	10	\$50.4
Cornell (2010)	338	420	140	114	N/A	\$31.9
UCLA (2009)	333	179	60	37	N/A	\$28.9
UC San Diego (2009)	373	286	64	85	9	\$26.3
Michigan (2009)	350	151	72	78	8	\$18.3
Johns Hopkins (2009)	352	579	46	99	10	\$16.2
Harvard (2010)	301	133	38	37	7	\$10.1
Wash U. (2009)	125	106	50	44	2	\$7.9
Pittsburgh (2010)	225	69	33	54	N/A	\$6.1
Colorado (2009)	258	204	24	61	11	\$4.4
Source: University Technology Licensing Office Annual Reports						

In response to observations that there were many centres and institutes in UniPort, Ajenka (2017) gave the following information in Table 5. It can be observed that John Hopkins University, USA has over 100 Research Institutes and Centres with 33 Nobel Prize winners

Table 5: Some Universities, Institutes, Centres & Labs

University (Principal Officer in-charge of Research & Development)	Number of interdisciplinary Research Institutes, Centres & Labs; Research Grants, Contracts	Notes & Impacts
John Hopkins University USA VP Research	Over 100 Research Institutes, Centres and Labs In 2009, Johns Hopkins received \$1.856 billion in federal research grants—more than any other US university. Research conducted by more than 6,500 faculty and scientists working in 154 countries with total revenues exceeding \$1.9 billion.	In 2014, expanded investment in technology transfer, filing 92 new U.S. Patents and creating 13 new startups, while holding 2,324 Active Patents and 3,898 completed Material Transfer Agreements. 33 <u>Nobel Prize</u> winners affiliated with the university as alumni or faculty members;
Harvard University Vice- Provost for Research	The range of research activities at Harvard is broad and deep. Harvard scholars conduct research in almost every field, and seek to expand human knowledge through analysis, innovation, and insight. Research is supported by more than \$800 million of sponsored research funds <u>each year</u> .	Several Nobel Prize Winners and Presidents, Prime Ministers and global leaders
MIT VP Research	55 Research Institutes, Centres and Labs In 2009, research expenditure was \$718.2 million.	MIT employs approximately 1300 researchers in addition to faculty. In 2009, MIT faculty and researchers disclosed 530 inventions, filed 184 patent applications, received 166 patents, and earned \$136.3 million in

		royalties and other income.
University of Pennsylvania Senior Vice-Provost for Research	165 Research Institutes, Centres and Labs With awards in excess of \$925 million, Penn receives over 5900 awards on an annual basis; one of the largest recipients of funding from the National Institutes of Health and federal support accounting for 85 percent of sponsored program support.	Economic impact on the Commonwealth of Pennsylvania for 2010 amounted to \$14 billion. In 2011 Penn topped the Ivy League in research expenditures with \$814 million worth of research, of which about 70% comes from federal support and in the most part from the Department of Health and Human Services. With \$400 million in 2010, Penn State is 6th strongest US University in terms of fundraising. With 165 research centres Penn State hosts a research community of over 4,000 faculty and over 1,100 postdoctoral fellows, 5,400 academic support staff and graduate student trainees.
CALTECH Vice- President , Research	47 Research Institutes, Centres and Labs + \$270 Million Annually \$343 Million (2011) Endowment:\$ 2.199B (2015) Small university Students Population:2255 Undergraduates:1001 Postgraduates:1254	Caltech is frequently cited as one of the world's best universities, 33 Caltech alumni and faculty have won a total of 34 Nobel Prizes 10 start-up companies formed Innovations Reported <ul style="list-style-type: none"> • Nearly 3,200 invention disclosures (campus only) since 1985 • Nearly 2,300 U.S. patents issued since 1985 Start-Ups <ul style="list-style-type: none"> • Over 130 start-up companies formed since 1995 • on average, 8 new companies started each year

		<p>Commercialization & Partnerships</p> <ul style="list-style-type: none"> • over 700 new licenses and options granted since FY 1995 • on average, 40–50 licenses are executed per year
<p>Stanford University</p> <p>Vice- Provost & Dean of Research</p>	<p>81 Research Institutes, Centres and Labs Research budget \$1.2 billion for 2011/12</p> <p>FACULTY 2,118 faculty members 21 Nobel laureates 4 Pulitzer Prize winners</p> <p>THE RESEARCH ENTERPRISE 5,300 externally sponsored projects \$1.33 billion total budget About 2,000 postdoctoral scholars 81 independent labs, centers and institutes</p>	<p>STANFORD INNOVATION</p> <p>In 2014–15, Stanford received more than \$95 million from 695 licensed technologies. Breakthrough inventions licensed by Stanford span medicine, engineering and the sciences</p> <p>Stanford entrepreneurs have created an estimated 39,900 companies and 5.4 million jobs since the 1930s.</p>
<p>Yale University</p> <p>Vice Provost for Research; also Associate Vice President for research Administration in the University Advancement Office</p>	<p>63 Research Institutes, Centres and Labs (44 in Medical School)</p> <p>Total research expenditures for the 2011 fiscal year including all restricted and unrestricted funds from all sources totalled \$594.5 million.</p>	<p>Yale is a world leader in science and medicine and is advancing cutting-edge technologies across its research labs. Yale more than 60 members of the National Academy of Sciences. And the Science Citation Index has consistently ranked Yale faculty researchers as “Best in the Nation” based on the worldwide impact of their published research papers. Yale has several start-ups contributing to the economy</p>
<p>UCLA</p>	<p>350 Research Institutes, Centres and Labs (290 Medical)</p>	<p>Leader in innovation</p>

<p>Columbia University, NY City</p> <p>Vice President Research</p>	<p>231 Research Institutes, Centres and Labs</p> <p>First North American site where the uranium atom was split; birth place of FM Radio, Laser, MPEG-2, Green Fluorescent Protein (GFP) in labelling cells in intact organisms</p>	<p>Credited with about 175 new inventions in the health sciences each year. More than 30 pharmaceutical products based on discoveries and inventions made at Columbia are on the market today.</p> <p><u>Columbia Technology Ventures</u> (formerly Science and Technology Ventures) currently manages some 600 patents and more than 250 active license agreements. Patent-related deals earned Columbia more than \$230 million in the 2006 fiscal year, according to the university. Between 1998 and 2008, 18 Columbia affiliates including nine faculty members won Nobel Prizes.</p>
<p>Penn State University</p> <p>Vice President Research and Dean of Graduate School</p>	<p>113 Research Institutes, Centres and Labs</p>	<p>Culture of Innovation with strong industry partnership</p>
<p>Purdue University</p> <p>Office of VP for Research & Partnerships</p>	<p>142 Research Institutes, Centres</p> <p>Purdue's West Lafayette campus alone boasts more than 400 research laboratories and 139 university-approved research centres and institutes.</p>	<p>Culture of Innovation with strong industry partnership</p>

In that same year, Harvard University with over 100 Research Institutes and Centres and several Nobel Prize winners spent more than \$800 million of sponsored research funds

MIT with over 55 Research Institutes and Centres in 2009 filed 184 patents and earned \$136.3 million in royalties and other incomes.

Let us see Research in the State of Israel created in 1948. Israeli University Mission is to promote the transfer of university

technology for the benefit of society while maximizing returns to support research, education and scientific excellence.

The Hebrew University Research company “Yissum” is the 11th Higher education Company in the world and earns over a billion USD from Intellectual Property, royalties and university based companies. Yissum registered over 5500 patents and 1600 inventions worldwide (Slide 7).

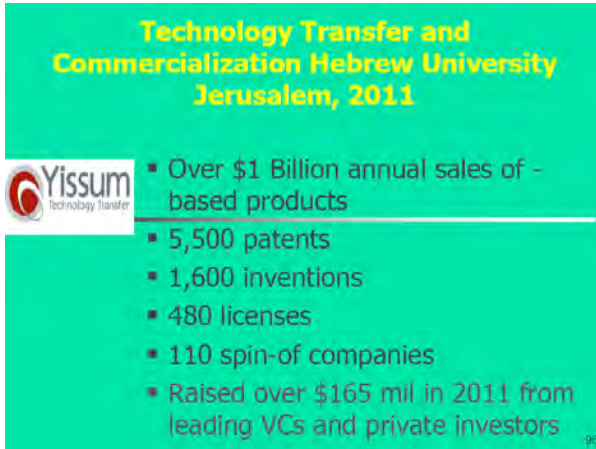
INVESTMENT IN EDUCATION

Israeli Universities earn from the academic research:

- The Hebrew University Research company, "yissum", is the 11th HE Company in the world.
- The Hebrew University earns over a billion USD from intellectual property, royalties and University-Based Companies.
- "Yissum" registered over 5500 patents and 1600 inventions worldwide.

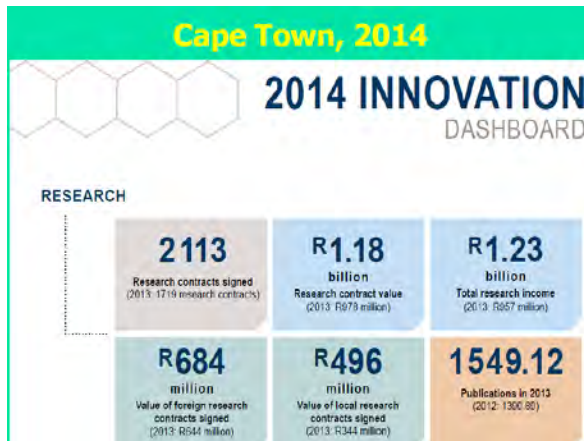


Slide 7A - Culled from Shevel (2014)



Slide 7B - Culled from Shevel (2014)

Slide 7B indicated that over \$1 billion is obtained from annual sales of based products in Hebrew University in 2011! Slides 8 to 10 show the 2014 research harvest from the University of Cape Town, South Africa.



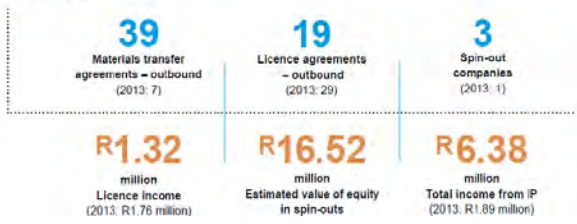
Slide 8 – Cape Town university 2014 annual report;
www.researchoffice.uct.ac.za/research_reports/annual/

Cape Town, 2014

INTELLECTUAL PROPERTY (IP) PROTECTION



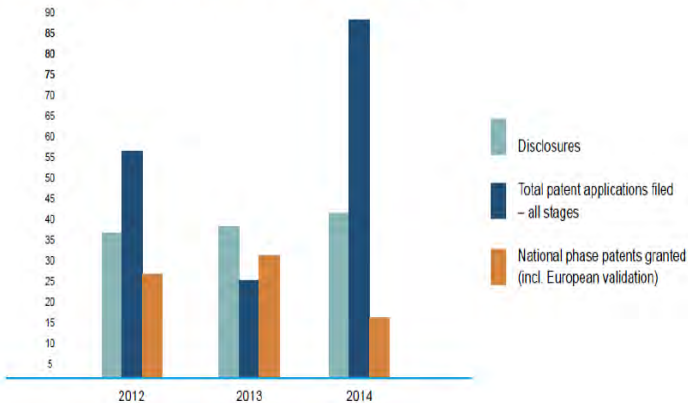
INNOVATION



Slide 9 - Cape Town university 2014 annual report;
www.researchoffice.uct.ac.za/research_reports/annual/

Cape Town, 2014

ANNUAL UCT PATENT PORTFOLIO STATISTICS



Slide .10 – Cape Town university 2014 annual report;
www.researchoffice.uct.ac.za/research_reports/annual/

INTERNATIONAL COMPARISON OF COMMERCIALIZATION IN ISRAEL WITH OTHER COUNTRIES

In 2011, Israel's income from Intellectual Property amounted to \$470 million while USA was \$1,814 million (Table 6).

Case Study of Commercialization in Israel

Table I: International Comparison, 2011

	Israel	Australia	United Kingdom	United States
Invention disclosures (2010+2011)	997	2,623	8,100	38,367
Patent applications	857	1,167	..	12,090
Licensed contracts	128	305	..	5,398
Start-up companies	11	15	268	617
Income* from IP (million \$)	470	459	..	1,814

Table 7 shows key performance indicators for Harvard University giving evidence of a research intensive global university with a rich harvest of intellectual property

Table 7: Key Performance Indicators (KPI): 2010–2015
(<http://otd.harvard.edu>)

KPI	2010	2011	2012	2013	2014	2015
Invention Disclosures	301	351	368	414	452	450
New Patent Applications Filed	133	204	197	231	246	243
U.S. Patents Issued	38	60	65	74	87	125
Licenses	37	45	34	34	43	50
Total Licensing Revenue (MM)	\$10.1	\$13.8	\$11.5	\$15.2	\$17.3	\$16.1
Start-up Companies	7	9	10	9	10	14
Industry-Sponsored Research Agreements	45	75	73	81	98	75
Industry-Sponsored Research (MM)	\$26.0	\$37.2	\$42.5	\$42.3	\$48.6	\$42.9
Material Transfer Agreements	1,284	1,530	1,731	1,878	2,243	2,332

Ajienka (2017) reported about a University in USA that sold a Drug at Stage 3 Level of Testing for \$1 billion, thus creating wealth for Researchers and School (Slide 11).



Rich Harvest of IPR

**University in USA recently sold a Drug
at Stage 3 level of Testing for one
Billion Dollars**

**Creating Wealth
for Researchers and School**

Slide 11 - *Culled from Ajenka (2017)*

What about the case of Thomas Alva Edison (Feb 11, 1847 – October 18, 1931) a prolific inventor, holding 1,093 US patents in his name in UK, France, Germany and one that developed the electric light bulb (Slide 12).



Rich Harvest of IPR

Thomas Alva Edison (February 11, 1847 – October 18, 1931) was an American inventor and businessman. Edison was a prolific inventor, holding 1,093 US patents in his name, as well as many patents in the United Kingdom, France, and Germany.
Origin of global company, GE

- He developed many devices that greatly influenced life around the world, including the phonograph, the motion picture camera, and the long-lasting, practical electric light bulb etc.

Slide 12 - *Culled from Ajenka (2017)*

Finally, a Nigerian Chinedu Echeruo sold a software to Apple Inc. For \$1billion in July 2013 (Slide 13).

The slide features a green background. At the top left is a small circular logo with a blue and green design. To its right, the title "Rich Harvest of IPR" is written in blue. Below the title, a photograph of Chinedu Echeruo is shown on the left, wearing glasses and a dark suit. To the right of the photo, the text "Nigerian Chinedu Echeruo Tech Entrepreneur and founder of Hopstop in USA sold City Transit Guide Software to Apple Inc. for \$1Billion, July 2013" is written in red. A small white box with the text "HOW THE Digital Guru Sold his company to Apple Inc." is overlaid on the bottom left of the photo.

Slide 13 - Culled from Ajenka (2017)

UNIVERSITY TECHNOLOGY TRANSFER

Technology transfer in the university benefits the economy. Universities substantially contribute to the creation of new technologies, new companies, new industries and new jobs. Highly specialized university employees known as technology transfer professionals manage the complete process of protecting discoveries and turning them into products and services. This is done by securing patent so that a discovery can be licensed and further developed by an existing company or a start-up to produce the new product.

University research sometimes yields a discovery that has commercial potential or the potential to improve, even change or save lives. Figures. 2 & 3 show the metrics of innovation by the Association of University Technology Managers (AUTM).

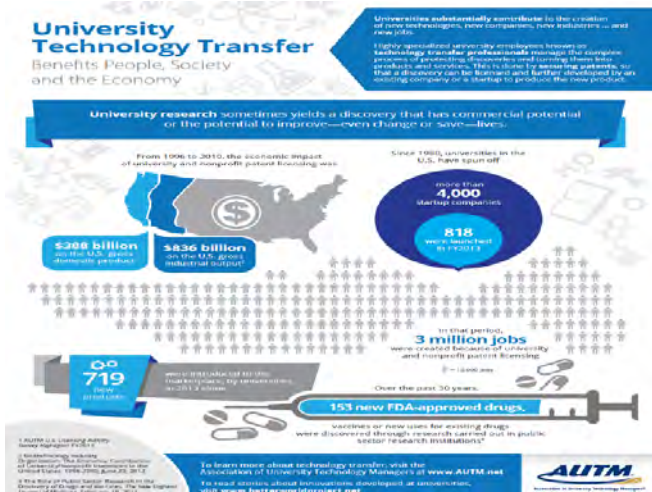


Fig. 2 www.autm.com

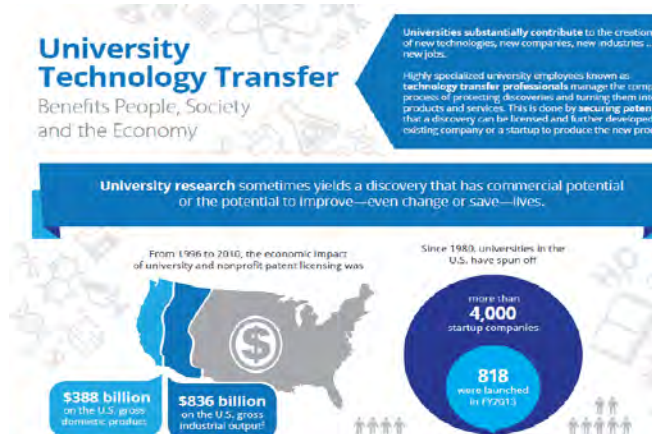
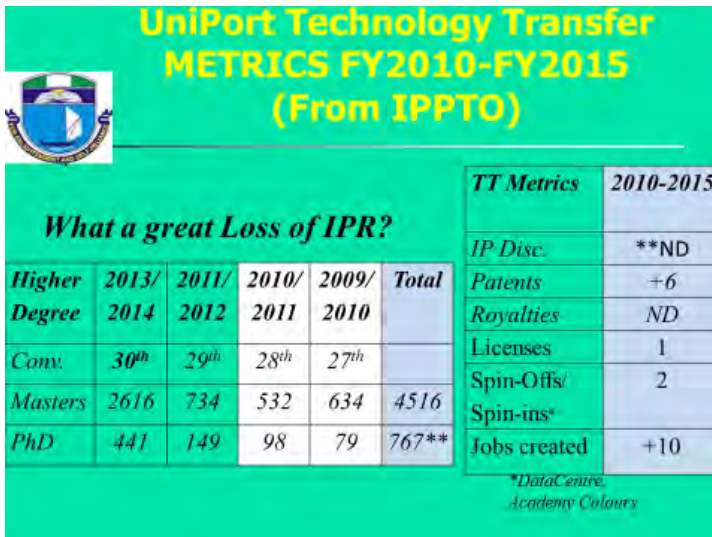


Fig. 3 www.autm.com

In his analysis of IPR of the University of Port Harcourt, Slide 14, Ajiienka (2017) observed that with 767 PhD and 4516 Master's degree graduates between 2010 and 2015, the intellectual property disclosure and patents compared to schools abroad is very pathetic. What a sorry state and loss of IPR?



Slide 14 - Culled from Ajiienka (2017)

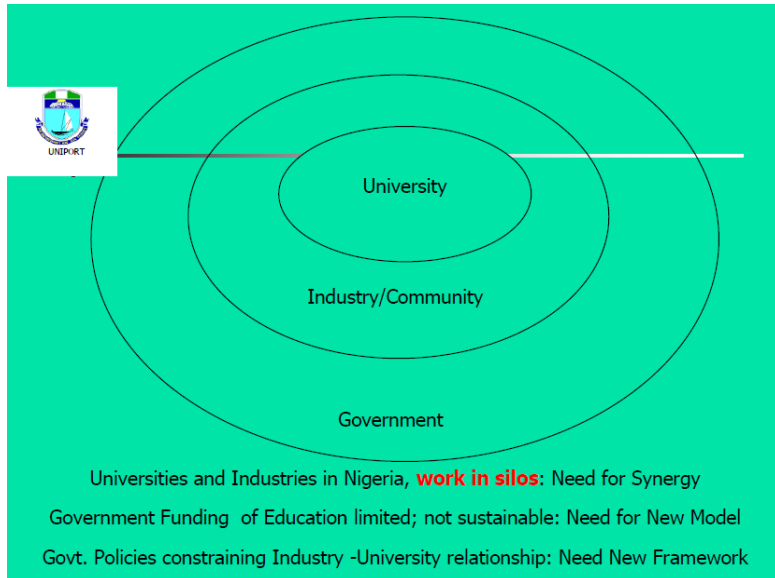
WHERE DO WE GO FROM HERE? CHANGE!

Change the paradigm because there are always alternative ways to doing things. Albert Einstein reminded us that the problems that exist in the world today cannot be solved by the level of thinking that created them and it is important to avoid doing the same thing over and over again and expect different results. There is need for creative and innovative thinking outside the box.

In the old Partnership Model, there is an unconnected relationship between University, Industry and Governments, Universities and Industries in Nigeria work in silos (Slide 15). There is a need for synergy. Government funding of education is limited,

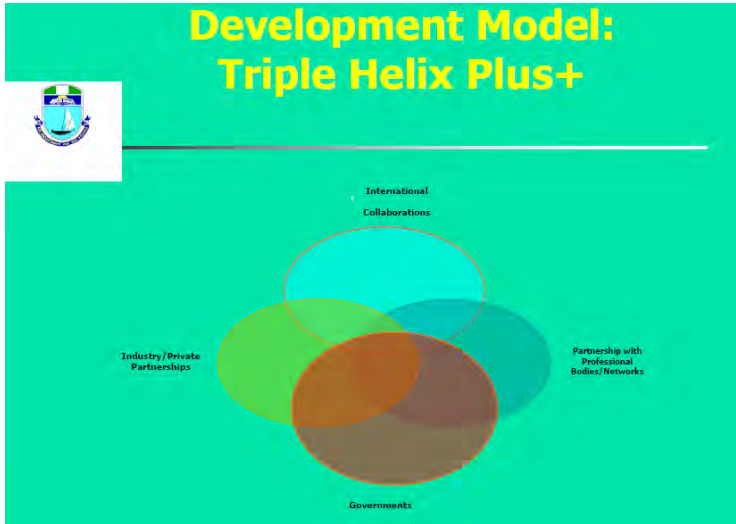
and not sustainable. Government policies constrain Industry – University relationship.

Old Partnership Model



Slide. 15

Etzkowitz and Leydesdorff (1998) proposed the Triple Helix Model of Government-University-Industry Partnership which was used as the conceptual framework in the establishment of the Institute of Petroleum Studies (IPS) UniPort. This framework has been deepened in the University of Port Harcourt to the Triple Helix Plus + Model (Slide 16) by incorporating into the partnership international and national collaboration and partnership with international and national professional societies and other stakeholders in which the energy and synergize of the Triple Helix model is more effective (Ajienka, 2015).



Slide 16 - Culled from Ajenka (2017)

WHERE IS UNIPOINT IN ALL THESE?

UniPort had had a stint with all these developments when Deputy Vice-Chancellor, Research and Development was elected by Senate and confirmed by the University Council in 2011. All these were achieved in the first two years of existence of the Office plus one year awaiting confirmation of the result of Senate election by the new University Council that never was (the Nigerian Factor!) despite a letter of approval by the Federal Ministry of education that the approved the Office in countermanding the 2011 Report of the Visitation panel report. In his valedictory lecture to congregation, July 2015, the 7th VC Professor Ajenka also reported that the then Chairman of Council also finally gave a letter of approval on behalf of Council after conferring with the Visitor to confirm the appointment. But then it was too late!

Anyway, our achievements speak for themselves. I will highlight just a few:-

IMPACT OF THE POSITION OF DVC, R & D

1. Membership of African Virtual University (AVU) Kenya
Many, if not all Universities were invited to become Partner Institutions but only University of Port Harcourt became the only Partner because we had a focus and direction. The office painstakingly met all the conditions needed for partnership. Thus University of Port Harcourt became the first Nigerian Partner Institution since 2011. The ODeL infrastructure domiciled in UniPort Business School is part of the evidence from that relationship.

2. World Bank Africa Centre of Excellence (ACE) for Oilfield Chemicals Research

Many were called; this time across the West African Sub-region to submit research proposals for World Bank Research grant. The Office of DVC (R&D) submitted two proposals, one on Oilfield Chemicals Research and a second, on Post-harvest Processing and Marketing of Sweet Potato, rice, plantain and banana under the auspices of Centre for Food Agripreneurship and Sustainable Livelihood (CeFASL). Both proposals went through the second screening process though finally the proposal on Oilfield Chemicals was chosen.

I am sure if we had had a graduate programme in Agriculture at the time we would have grabbed the two because of the quality of the research proposals. About fifty-four institutions applied for the grant in Nigeria and ten were chosen. Our own ACE has done excellently well. The evidence is here again. On 25th March, 2017, thirty-seven (37) doctorate degrees were harvested at the 31st Convocation Ceremony of UniPort. Out of 63 candidates that were admitted into the ACE-CEFOR programme 37 made it to the finish line, our first set of graduates. What an excellent feat, to finish PhD in just over two years!! It can be

done and had been done even in our regular programmes. Kudos to all that were involved.

3. **The Regional Centre of Expertise (RCE, Port-Harcourt)**

In another development, the Office was also responsible for attracting the United Nations University Regional Centre of Excellence in Sustainable Development to UniPort. Application for the establishment of the RCE, PH was first made on the 30th May, 2014 to Global RCE Service Centre in Tokyo, Japan. Following five revisions arising from queries to the application, the sixth version was finally approved in June 2015. The RCE, PH serves as a platform for all-inclusive efforts aimed at finding solutions to identified challenges in the Niger Delta Region such as environmental pollution and degradation, loss of biodiversity, climate change and low human capital development. It is planned to cover a land area of 2,500 hectares that spans about eight Local Government Areas of Rivers State (Eleme, Emohua, Etche, Ikwerre, Obio-Akpor, Okrika, Oyigbo and Port Harcourt City described as greater Port Harcourt).

The three specific challenges that RCE, PH seeks to address are Environmental Pollution and Ecosystem Erosion, climate Change, Food Insecurity, Poverty Prevalence and low Human Capital Development Index.

4. An unprecedented awareness of research and development was created in the University community.
5. Strategic Research Plan with measurable Key Performance Indicators, Research Ethics Policy, Intellectual Property Policy, Research Management Policy and Administrative Policy and General Guidelines on Centres, Institutes and

Endowed Chairs Policy were approved by Senate to give direction and focus to our research.

Many research Institutes, Centres and Professorial chairs were established based on Senate approved Administrative Policy and General Guidelines. They were primarily to be research intensive by attracting research grants locally or globally and not to be dependent on the university as is global best practice. Some attracted sponsors that built infrastructures or equipped their laboratories.

Research Institutes are:

- Offshore Technology Institute
- Institute of Niger Delta Studies
- Institute of Arts and Culture
- Institute of Engineering Technology and Innovation Management
- Bamanga Tukur Institute for International Trade and Development now known as Institute of International Trade and Development

Research Centres are:

- Centre for Gas, Refining and Petrochemicals
- Centre for Higher Education Studies
- Open, Distant and e-Learning (ODEL) Centre
- Centre for Logistics and Transport Studies
- Patience Jonathan Centre for Gender and Women Development Centre
- Centre for Disaster Risk Management and Development Studies
- Centre for Energy and Nuclear Studies

Professorial Research Chairs

Endowed Professorial Chairs rose to 68 in 2014 and netting more than 100 million naira Seed fund and Research Grants. Some were very active. Examples of these chairs are:

- O. B. Lulu-Briggs Chair of Petroleum Geosciences
 - Stanley Lawson Chair of Environmental Geology
 - Kay Williamson Chair of Applied Linguistics
 - E.J. Alagoa Chair of Historiography
 - Fugro Chair of Environmental Sciences
 - Chi Ikoku Chair of Petroleum Engineering
 - SJS Cookey Professor of Malaria Studies
 - SJS Cookey Chair of History
 - Herbert Wigwe Chair of Safe Motherhood
 - Chirota & Emmanuel Egbogah Distinguished Professor of Petroleum Economics, Policy and Strategic Studies
 - Enoch George Chair of Geotechnics
 - Gesi Asamaowei Chair of Coastal Engineering
 - Pelfaco Chair of Petroleum Engineering
 - Total Chair of Petroleum Engineering
 - Yemisi Shyllon Chair of Fine Arts
6. Spate of Inaugural Lectures soared from 76 in 4 years (1977 – 2011) to 101 by March 2013, with two presentations at times in one month, all of which were accessible online.
7. Research Partnership with many institutions and organizations such as the University of Toronto, NNPC (R&D), PAX Herbal Laboratory, TOTAL E & P Nigeria limited and RUFORUM.

8. Publications from the office include:-
 - i) Annual Reports 2011 – 2012; 2012 – 2014
 - ii) Creativity and Innovation Magazine
 - iii) Women in Research (Vols. 1 and 2)
 - iv) International Journal on Research and Development
 - v) The Unique Entrepreneur Magazine
 - vi) The Evolution of an Entrepreneurial University

9. The Technology Park being established at Choba Park was registered with the World Association of Science Parks. A pilot plant for Paint Research was established at Delta Park. The facility is a bee-hive of activities for students on Industrial Training as well as staff interested in chemical and allied research.

10. Research Fairs were conducted annually, the first in April 2012 and the University participated in the National Universities Commission (NUC) Research Fair and won awards.

11. Several individuals and groups were awarded research grants and fellowships viz PTDF, FUGRO etc. There were also several research breakthroughs.

12. 2015 Times Higher Education (THE) Ranking of Research Influence: The contribution of the Office of DVC (R&D) in projecting the Research and Development image of the University cannot be over-emphasised. To crown the effort of the Office, UniPort was rated the best in Research Influence in Nigeria and 6th in Africa, and within 300 in the world by the United Kingdom based Times Higher Education World University Ranking agency No Nigerian university has ever been ranked by any ranking body to be

among the Top 1000 universities in the globe, but we are now among the Best 276 to 300 universities in research influence. (See Slide 17)

TIMES HIGHER EDUCATION WORLD UNIVERSITY RANKINGS



Two links to confirm this ranking:

- 1) https://www.timeshighereducation.co.uk/sites/default/files/styles/panopoly_image_original/public/top-15-african-universities-by-research-influence-090715-large.jpg
- 2) <https://www.timeshighereducation.co.uk/news/south-african-institutions-top-rankings-pilot>

Times Higher Education creates a top 15 table for Africa's academies ahead of the inaugural *THE* Africa Universities Summit on 30-31 July, 2015

Top 15 African universities by research influence

AFRICAN PACEMAKERS: TOP 15 BY RESEARCH INFLUENCE					
Rank	Position in World University Rankings 2014-15	Institution	Country	Publication output 2009-2013	Overall Score
1	124	University of Cape Town	South Africa	5540.21	99.9
2	251-275	University of the Witwatersrand	South Africa	4387.17	99.76
3		Makerere University	Uganda	1112.69	99.72
4	276-300	Stellenbosch University	South Africa	4357.33	95.48
5		University of KwaZulu-Natal	South Africa	4235.09	89.41
6		University of Port Harcourt	Nigeria	573.55	88.92
7		University of the Western Cape	South Africa	1154.77	84.61
8		University of Nairobi	Kenya	671.72	84.6
9		University of Johannesburg	South Africa	2192.74	83.64
10	301-350	University of Marrakech Cadi Ayyad	Morocco	910.82	78.61
11		University of Pretoria	South Africa	4544.33	75.89
12		University of Ghana	Ghana	804.53	73.31
13		University of South Africa	South Africa	981.67	72.51
14		Suez Canal University	Egypt	998.98	69.69
15		University of Hassan II Casablanca	Morocco	960.25	69.03

Slide 17, THE Ranking on Research Influence

13. Other Developments

- We introduced the use of TURNITIN for plagiarism check of graduate students and staff research.
- Policy on publications by graduate students, minimum of 2 journal articles for PhD and 1 for Masters came into full effect.
- The University website was improved upon that led to better visibility and ranking
- We participated in the African Conference of VCs and Rectors in East Africa and presented the land mark paper on the concept of Triple Helix PLUS+ which is attracting global attention

All these were achieved in the first two years of existence of that office plus one year of awaiting confirmation of the result of Senate election by the new university Council that was never came to be.

Nigerian Universities should ask themselves the following questions:

- i) How many Discoveries, Patents, and Licenses have we secured?
- ii) How many spin-off companies have we established?
- iii) How many jobs have we created?
- iv) How much wealth have we generated?
- v) How have we contributed to Sustainable Development of School and Society?
- vi) How many Nobel Prizes Winners can we boast of?

WAY FORWARD

- i) Establish Office of Research and Development
- ii) Develop Research and Development Policies.
- iii) Restructure School of Graduate Studies, Institutes and Centres.
- iv) Develop Research and Development Strategic Plan.
- v) Review Research Structure.
- vi) Encourage Indigenous knowledge.
- vii) Enlightenment about Entrepreneurial University and Triple Helix Benefits for shared vision and Paradigm change.
- viii) Understand and respect Partnerships.
- ix) Have a Marketing and Communication Unit.

ENTREPRENEURIAL UNIVERSITY STRATEGY

Develop the following:

- i) Industry Partnership: Use Industry Labs and software, industry project life-cycle involvement and sponsorships.
- ii) International University Networks: Co-operation and collaboration in Research and Development, Joint Patents and Licenses and Royalties.
- iii) Collaboration with Professional Societies.
- iv) Partnership with MDA Research Institutes.

- v) Work with Local Chamber of Commerce and Industries.
- vi) Enterprise Labs for Research and Development/Contract Research.
- vii) ISO Certification (of Labs, organizations etc.)
- viii) Office of Technology Transfer and Licensing.
- ix) Interdisciplinary Research Teams/Centres/Institutes.
- x) Post-doctoral Research Fellowship Programme as valuable research community, partnership and internalization.
- xi) Innovation and Technology Commercialization Company like Yissum, Imperial Innovations etc.
- xii) Technology Park; Technology Incubators, Pilots, Prototypes and Start Ups.
- xiii) Art Village for creative industry development.

With over 200 Professors in UniPort, Etzkowitz (1998) defined an Entrepreneurial University as a place where 25% of Professors are engaged in entrepreneurial activities with industry, involved in globally recognized and locally relevant industrial research and production, creativity, innovation, commercialization and entrepreneurship.

CONCLUSION

Mr. Vice-Chancellor Sir, Distinguished ladies and gentlemen, for the past nearly one hour of my lecture I have been trying to make a case for intensive research activities in the university. The result is clear that one day and in the near future Uniport will be reckoned with globally as being among the 500 of top ranking universities in the world. Abolish Academic slavery from Publish or Perish to Patent, Publish and Produce.

Our researchers should see research as enterprise and apply for national and international Research Grants, Professorial Chairs should be sourced and secured. Everybody should engage in systemic University Advancement Strategies. The new Paradigm in

Academic progression should be followed, Patent, Publish and Produce. New discoveries, knowledge and Technologies should be patented, then published in globally recognized high impact factor journals. With this the university will achieve Web Visibility and High Citation Index. Monographs, Field Operations Manuals, Books etc. can be published. The benefits from this New Paradigm in Academic Progression include Harvest of Patents, Royalties, Licence Incomes, Shares from Start-Ups/Spin-Offs, Contract Research incomes, Grants, Recognitions and Promotions.

Research and Development are indeed change agents for sustainable development of school and society. Research is the key that opens the door for prosperity and secures the future of entrepreneurial universities.

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Uche, C, Akaranta, O, Ajiinka, J and Abbey, B. (2013): Community-University Engagement for Economic Empowerment: The Nigerian Experience, 6th International Barcelona Conference on Higher Education, Global University Network for Innovation (GUNI) Conference, p1-4

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CITATION ON



PROFESSOR BENE WILLIE ABBEY,
BSc (Ibadan), PhD (Nottingham), FASCN

Today, I am called upon to read the citation of a foremost academic whose profile negates any erstwhile misconceptions about the girl-child. An accomplished Biochemist and researcher [Specializing in Nutrition and Toxicology] Professor Bene Willie Abbey was born in Degema, Rivers State of Nigeria on 16th January, 1948 to Mr. Israel Willie Bob-Manuel and Mrs. Celia Willie Bob-Manuel, both of whom were teachers.

She attended the prestigious Secondary School then in Eastern Nigeria, Archdeacon Crowther Memorial Girls Secondary School (ACMGS), Elelenwo. She equally attended Nigeria's foremost university, the University of Ibadan, graduating in 1972 with BSc (Hons.) 2nd Class Upper Division in Agricultural Biochemistry and Nutrition. She achieved and enjoyed the status of University Scholar throughout her stay at the University of Ibadan. Other academic activities quickly followed and by 1976 she had bagged a Doctor of Philosophy (PhD) in Nutritional Biochemistry, University of Nottingham, United Kingdom.

Armed with these requisite qualifications and relevant exposure, Professor Abbey in 1978 returned to the service of her country starting with a stint at the Nigerian Institute of Trypanosomiasis Research (N.I.T.R.) in Kaduna and Vom as Head of Biochemistry. Within her service period in the Institute, remarkable impact was made on various facets of its operations. For instance, the then Dr. Abbey's Research Proposal on Onchocerciasis (River Blindness) led to an increase in staff strength in a hitherto dormant department. Field trips were embarked upon culminating in the production of well researched publications. In short, the department was re-activated and made viable.

In 1980, she joined the services of University of Port Harcourt, where she has remained till date. Needless to say that, the same inert zeal to make a difference remained a propelling force in her engagements in the University. It is on record that the story of Uniport's Department of Biochemistry cannot be fully told without the mention of Professor Willie Abbey who, while serving as a pioneer head of a new unit of Biochemistry in the old School of Chemical Sciences nurtured it to a full-fledged Department in the Faculty system. This department is now structured in such a way that it provides services for all Education, Agriculture, Engineering, Science and Medical students. Principally a lecturer in the Department of Biochemistry, Professor Abbey's other services to the University included but not exclusive to the duty post of Director of Basic Studies Programme, a remedial programme and Dean, School of Graduate Studies. With her on the saddle as Dean, the school boasted of a more befitting complex than what it had before, an Alumni Office, Senate approval of its Calendar, Public faculty seminars, Public lectures presented by both Internal and External Resource Persons, students graduating as at when due (except where it is the student's fault and which of course attracts additional school fees), while a world class building is on the drawing board, internally generated revenue from the School increased tremendously. She became the first Deputy Vice-Chancellor, Research and Development thereafter.

How true the saying that the gold fish has no hiding place. Prof. Abbey was at one time spotted out and appointed

Commissioner for Information, Tourism and Culture by the Rivers State Government (1989 -1991), a position she combined with overseeing women Affairs. While there, her being the only female in the cabinet notwithstanding, she successfully established from scratch to full transmission the RSTV Channel 22UHF. Also in the same dispensation, Radio Rivers experienced laudable re-organization and expansion. Other beats of service for Prof. Abbey included pioneer member of the Board of National Institute for Pharmaceutical Research and Development (NIPRID), Idu, Abuja; pioneer member of the Steering Committee of West African Research and Innovation Management Association (WARIMA), as well as a number of other state and national assignments. The University of Calabar, Benin, Uyo, Ahmadu Bello University and Rivers State University of Science and Technology have at one time or the other enjoyed her expertise as External Examiner for their graduate and undergraduate programmes while equally, the Universities of Uyo, Maiduguri, Delta State University and Michael Okpara University of Agriculture, Umudike have had her on their desk for their Professorial assessments.

As a renowned Scientist, Prof. Abbey has led several NUC accreditation teams for resource verification and accreditation exercises for universities.

Chairman, ladies and gentlemen, Prof. Abbey is widely published with a copious number of well-researched articles in reputable national and international journals. A 1985/1986 Fullbright Fellowship awardee (affiliated to University of Georgia, Athens, USA), she is also a recipient of over 20 professional and social awards. To her credit is the successful supervision of many MSc/PhD projects, three of whom are now Professors. Her membership of Professional bodies includes that of Institute of Food Science and Technology, Nigerian Society of Biochemistry and Molecular Biology, Nigerian Nutrition Society, Nigerian Institute of Food Science and Nigerian Institute of Animal Science.

It must be mentioned at this juncture that aside from Prof. Abbey's academic, professional and managerial skills, she has to her credit a good dose of positive disposition that fosters enduring interpersonal relationship in a work environment. She worked and

fostered good relationship between the oil companies and their host communities during her sabbatical leave in the Community Development facet of Shell Petroleum Development Company Limited. It is certainly not a misnomer to salute her as a good team player.

She is married to Professor Samuel Abbey and they are blessed with two children, Osaki Abbey and Omiete Agbator and two grandchildren, Opakirite Abbey and Ofure Agbator.

Vice-Chancellor, Sir, distinguished ladies and gentlemen, it is indeed my singular honour and privilege to present to you a wife, mother, distinguished academic, quintessential administrator and a role model par excellence.