

**UNIVERSITY OF PORT HARCOURT**  
**RESEARCH & DEVELOPMENT (R&D)**  
**IN AN ACADEMIC ENVIRONMENT:**  
**THE JOY & CHALLENGES**

**VALEDICTORY LECTURE**

**By**

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## **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. He shall step on the rostrum, and deliver his Valedictory Lecture. After the lecture, he shall step towards the Vice-Chancellor, and deliver a copy of the Valedictory Lecture and return to his 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**

This Valedictory lecture is dedicated to God Almighty, the creator of the universe and the giver of wisdom and knowledge, who has orchestrated my federal government scholarship with secondary school certificate to study engineering in the United States of America; quickened my excellent performance in the university education; and my wealth of contribution to the academics and the body of Christ in my ministry. The hand of God upon my life has paved way for writing of this document.

To God be the glory for what He cannot do does not exist.  
Amen!!

## APPRECIATION

Vice Chancellor, Sir, let me crave your indulgence to appreciate some personalities that have encouraged me and added value to my productivity as an academician & a professional consultant.

I sincerely thank God Almighty, God that sees me in my career and in my journey of life; for His grace & mercy are new everyday. I wish to thank the first generation of faculty of engineering that have inspired my team-spirit; people like late Prof. Chi U. Ikoku that recommended me to the university administration for employment while we were both in the US. Late Prof.; Mbuk Ebong, the first head of department of civil engineering; Prof. Anthony O. Ibe, of electrical/electronics engineering; Prof. Mike Onyekonwu, of petroleum engineering; Prof. S. U. Ejezie & late Dr. E. O. Duru, both of civil engineering; Prof. Joseph Ajienska of petroleum engineering, the 7<sup>th</sup> vice chancellor who recommended me as the pioneer director of Centre for Occupational Health, Safety & Environment (COHSE) and equally encouraged the storey building for the Centre by direct labour.

Many thanks for the second-generation colleagues that have helped to sustain my zeal in this era of Centres of excellence in UNIPORT, and they are: Prof. Orish Orisakwe, of pharmacology/toxicology; Prof. Onyewuchi Akaranta, of chemistry; Prof. Joel Ogbonna of petroleum engineering; Prof. Mrs O. M. O. Etebu, of mechanical engineering; Prof. Mrs B. U. Dike, of FUTO; Prof. J. C. Agunwamba, of UNN and many others. I wish to equally appreciate the cooperation of my numerous mentees in civil engineering and many other Centres I was privileged to supervise their MSc & PhD projects.

Equally important, I sincerely appreciate one of my very visible professional consultant colleague, Engr. Levi Uba, for numerous consultancy works we have done together in the Niger Delta; for which the experiences are very rewarding particularly in Journal publications. I thank God immensely for my colleagues in the ministry for spiritual assignments in the areas of crusades, evangelism, solemn assembly, thanksgiving & community deliverances: Evang. O. P. Nwachuku; Evang. Bright Alaribe; Pst. Francis Onyeoziri; Pst. Promise Chinagorom, etc.

Many thanks for members of my family. Thank God for my wife Dr Mrs Anne Chinenye Nwaogazie for her unwavering supports & prayers; and my five kids, for all their encouragements. I pray that God will bless them mightily.

Finally, I wish to thank the vice chancellor of the University of Port Harcourt, Prof. Georgewill A. Owunari and the university administration for granting me this opportunity to deliver the 32<sup>nd</sup> valedictory lecture this day; and you the audience for making time to be present, you remain the most important personality in this occasion.

**Engr. Prof. Ify L. Nwaogazie,**  
FNSE, FNICE, FISPN, FIPS EP-NREP (USA).

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# ***RESEARCH & DEVELOPMENT (R&D) IN AN ACADEMIC ENVIRONMENT: THE JOY & CHALLENGES***

## **1. INTRODUCTION**

Valedictory lecture may be taken as a bundle of experiences gained over the years by the presenter (a university professor, supreme court judge, etc.) in the course of his working experience before his retirement. It tries to capture the victories or joy recorded and problematic areas or challenges and attempts to proffer solutions.

### **1.1 Concept of Research & Development**

Research & Development (R&D) is analogous to science & technology as knowledge & wisdom are related. For sake of simplicity, knowledge is simply facts of any kind and wisdom is the translation of knowledge into problem solving. Research doubles for knowledge, a facet of fact finding while Development stands for the translation of research outcome into production of goods & services for the benefit of mankind. The process of Research is similar to feasibility study that ends up in Conclusion & Recommendation. Conclusion is the summary of the findings while Recommendation is the action statement(s), the line of action(s) prescribed. The heartbeat of any research is data collection (in form of time series or spatial) and data analysis via statistical methods:

- i. Descriptive statistics with respect to mean, standard deviation (SD) that reveals the level of spread about the mean and thus questions the validity of data set when SD is very large; and skewness that doubles for

normality test. If normally distributed then parametric method is applicable otherwise non parametric is adopted (Nwaogazie, 2021).

- ii. Test of Significance (inferential statistics) for comparative analyses; and
- iii. Cause & Effect relationship that translates into model development for purpose of predictions and decision making.

Any infrastructure that must be designed and constructed must benefit from the outcome of cost and effect modelling. For instance, building a bridge with a life span of 100 years, will definitely involve flood forecasting in 100-year time (in the future) and allowance for peak flow made in the design phase to avoid future flood damage.

Thus, Engineering Research aids design of structures & facilities for the future.

### **1.2 What is a Researchable Topic?**

For the interest of a young Researcher, there is need to define what we mean by Researchable topic. Any research topic must be evaluated based on: i) time and ii) cost. On time scale, an undergraduate final year project, master's dissertation and PhD thesis naturally will attract minimum durations of 3, 6 and 12 months, respectively. Topics likely to over shoot the minimum time limit by 25% or more are definitely not researchable topics.

A very noticeable trend in Nigerian higher institutions is the problem of research funding by external bodies which has

culminated into self-sponsored research. The cost of student sponsored research has become an issue given that sponsorship is student-dependent. Once the estimated cost is beyond the student affordability, then the topic in question is not researchable. This is a relative cost-concept, unaffordable case for one researcher may be affordable to another. In effect, researchable topic on cost basis should be assessed on student affordability. Topics should not be imposed on students by supervisors or Department without affordability evaluation unless such research is funded.

## **2. CHALLENGES IN R&D**

### **2.1 Resistance to new concepts & development**

Most people respect authority, and one problem faced by anyone who has something new to say is that people are reluctant to accept anything that conflicts with existing beliefs. In science and engineering, every statement should be based on evidence and not on unsupported opinion. Speculation cannot take the place of evidence (Houp & Pearson, 1973).

According to The New Encyclopaedia Britannica (1974), Galileo, an Italian astronomer, physicist & mathematician disapproved the Egyptian teachings on astronomy called Ptolemy's theory, which states that the moon has a smooth surface and the earth is fixed while the sun rotates around it. Galileo is of the Copernican theory which states that the surface of the moon is rough and the earth rotates around the sun. This view brought about a conflict between ecclesiastical authorities and Galileo, the Copernican theorician. Galileo went to Rome to beg the authorities to leave the way open for changes and not to translate scriptures allegorically whenever it

comes into conflict with scientific truth. However, this unresolved conflict landed him into house arrest for the last 8 years of his life.

Examples abound in literature on resistance to new concepts particularly in the early development of science and technology.

How about the theory of motion on falling bodies? In 1589, Galileo disapproved Aristotelian contention that bodies of different weights fall at different speeds. At Padua, Galileo in 1604 established theoretically that falling bodies obey what came to be known as law of uniformly accelerated motion. This new concept did not go down well with Aristotelian school of thought.

In this 21<sup>st</sup> century are we fully liberated from the shackles of resistance to new ideas? The answer is NO, so we need to create room for and accommodate new ideas. This is the way to go and give leverage to R&D.

## **2.2 Lack of perseverance**

Many people lack the spirit of start and finish and will always throw in the towel after few attempts. Calvin Coolidge, the 30th American president (1923 – 1929) once said: “Nothing in this world can take the place of persistence”; surely, talent, genius and education will not. Persistence and determination alone are omnipotent.

A Twitter user, simply known as ‘Royalty’, who took to her handle to celebrate the fruit of her persistence; five and half years of job search and after 4000 applications which were

turned down. And She finally got a job on the 4001th application.

How about the man that discovered electric bulb, Thomas Edison who made 1000 unsuccessful attempts before discovering that carbonized bamboo filament could last for 1200 hrs. This discovery marked the beginning of commercially produced electric bulb in 1880 as it was marketed.

Occasionally, you confront a researcher on his plan, say, in 10 year's time, you may be surprised to hear him say "don't worry, when I get to the bridge I will know how to cross". Definitely, he is among the group that lacks vision and has no room for alternative plans, *abi-initio*. Research is exploratory, if we know the end from the beginning, then it's not a Research, so it should be vigorously pursued with alternative plans in case earlier plans fail.

### **2.3 Lack of Succession Plan**

Lack of adequate and sustainable succession plans has slowed our advancement in research & development. The issue of mentor & mentee by Ibe (2021) addressed this issue.

Examples abound in our university system- a case of University of Ibadan closing the Department of Petroleum Engineering in the '80s because of the retirement of its professors, was as a result of no succession plan. What a pity! The same fate is looming here in Uniport in the Dept. of Civil Engineering where Professor Nwaogazie is the only senior academic in Water Resources & a younger academic (Senior

lecturer). If nothing is done soon, the PG programs will suffer a big setback as the programmes may be suspended for a while. Similar situations can be found in other departments.

## **2.4 Tribalism in Staff Recruitment**

Tribal sentiments in academic environment have a negative & damaging effect on research & development. In a situation where underqualified persons are employed to lecture & supervise research work, what becomes the outcome? Can a man give what he does not have? We should be on the lookout for the best brains as academics. Developed nations- America, Canada, Britain, China and others have recorded much gain by employing bright and promising immigrant scholars. Today, Nigeria has been able to establish what is known as Nigerians in Diaspora Commission (NIDC), which is keeping track of records of their significant contributions. Our universities' administrators should take advantage of Nigerians in diaspora for tenured or contract employment. Here are details of selected few Nigerians in foreign countries with track records (NIDC, 2022):

- i. Augustine Esogbue, a Prof. Emeritus in H. Milton Stewart school of industrial systems engineering at Georgia Tech in USA. He has many prestigious awards celebrating academic & professional excellence.
- ii. Emmanuel Ikechukwu Umujirioha the 1<sup>st</sup> Igbo language lecturer in UK. He is also fluent in Chinese and is a translations director for Albitman publishing based in the US and UK. Emmanuel promised to make Igbo language known to the world.

- iii. Adeola Deborah Olubamiji, a specialist in Metal & Plastic additive manufacturing. She is currently the director of additive manufacturing solution at desktop metal and founder of Stem Hub foundation, in Canada. She has to her credit some prestigious awards- one of the 27 influential women in manufacturing honoree in the US.

It is on record that University of Port Harcourt has benefited from Nigerians in diaspora being hired and appointed as pioneer Directors in our centres of excellence:

Prof. J Amadi – Ichendu, Institute of Engineering Management and Technology (METI)

Prof. Omowumi Iledare, Emerald Energy Institute; and

Prof. Godwin Igwe, NLNG- Center for Gas, Refining & Petrochemicals (CGRP).

### **3. RESEARCH SUCCESSES & CHALLENGES IN UNIPORT**

#### **3.1 Establishment of Centres of Excellence**

As at 2023, University of Port Harcourt has to its credit a total of 24 Centres, 12 Institutes & 4 Schools of excellence for R&D. The Faculty of Engineering is housing 6 out of 24 Centres as well as 4 out of 12 institutes in Uniport, namely: Institute of Petroleum & Energy Studies (IPES) formerly IPS, Centre for Occupational Health, Safety & Environment (COHSE), African Centre of Excellence in Oil Chemicals (ACE- CEFOR), Offshore Technology Institute (OTI), Emerald Energy Institute (EEI), Institute of Engineering

Technology and Innovation Management and (METI), Centre for Petroleum, Refining & Petrochemical (CGRP), Centre For Information Technology Engineering (CITE), Centre For Nuclear Engineering Studies (CNES) and Centre for Geotechnical, Coastal Engineering & Research (CGCER).

We recall that a Research Proposal on oil field chemical attracted the funding of African Centre of Excellence (ACE-CEFOR) by World Bank. Senate's approval of its PhD program for a minimum of 2 years duration initially met with resistance. It has been a tradition for our regular PhD programs to have minimum of three years for graduation. The superior argument has it that all students may never graduate within 2 years, so the opportunity for late graduation is inbuilt.

The ACE-CEFOR graduation records of PhDs since inception in 2014, is the largest annually (See Table 1) as compared to other programs in the Faculty of Engineering and/or the entire university. For sake of records, graduation of PhDs from Engineering Departments are as follows: Chemical =11 (2003-2021); Civil & Environmental = 7 (2012-2023); Electrical/Electronics = 2 (2007-2023); Mechanical = 5 (2013-2023); Petroleum & Gas = 14 (2007-2023), respectively; altogether, we have a total of 39 PhD graduates from the Faculty of Engineering between 2003 and 2023.

Any reason for low rate of PhD graduation in the Faculty of Engineering? Yes, low subscription is attributed to unnecessary delays in graduation, limited areas of specialization and few senior academics to teach and supervise projects. Addressing these issues positively is likely to increase



the PhD subscriptions and perhaps more graduation outputs annually.

**Table 1: Admission & Graduation Distribution of PhD Students In ACE-CEFOR**

Year	Batch	Number Admitted	Number Graduated	Droputs
2014-2015	B-1	51	46	6
2016-2017	B-2	69	59	10
2018-2019	B-3	61	45	16
2020-2021	B-4	46	Not yet graduated	
2022-2023	B-5	25	Not yet graduated	
			$\sum_{B=1}^3 = 150 \text{ Graduates (2019)}$	32

In consonance with ACE-CEFOR, the Centre for Occupational Health, Safety & Environment (COHSE) has performed creditably well in the areas of PhD graduation and infrastructural development. The Centre commenced activities in 2010/2011 academic session with two MSc Programs (OHS & ETM) & in 2014/2015 session, two parallel PhD programs in OHS & ETM commenced. A total of 60 PhD candidates were graduated between 2017 – 2023. This is commendable!

Another remarkable success in COHSE is the design and construction of a storey building of 14 No. class rooms & offices in 2015 by the Pioneer Director, Engr. Prof. Ify L. Nwaogazie from the proceeds of school fees. This venture was planned as a joint project by the Nigerian Institute of Safety Professionals & COHSE. At the commencement of the project, the Institute pulled out of the project because of its in-house

management that ended up in litigations. By direct labour approach, the project was completed in record time of seven months at a cost of N50.5 million. At the back of our minds, a capital project similar to COHSE Building should be undertaken by Centres of Excellence for sake of sustainability. How can a centre operate perpetually in a borrowed accommodation? This was the driving force that inspired us in COHSE at the time to plan & build by direct labour to save cost. Other centres can borrow a leaf from COHSE.

In the spirit of borrowing a leaf from COHSE, the Sandwich program, Faculty of Education went into action with a two-storey building in Choba park by direct labour during the tenure of the 8<sup>th</sup> Vice Chancellor. This is again commendable! Worthy of note are cases of buildings designed & built by industries & agencies for institutes & Centres, like IPS, Emerald Energy Institute, CGRP, CITE, CNES & ACE-CEFOR. These are success stories in the advancement of Research & Development in an academic environment.

### **3.2 Joint Supervision of PhD Projects**

The concept of joint supervision may be taken in 2 perspectives: A case where 2 or more supervisors of the same discipline or 2 or more supervisors from 2 different disciplines are involved in the supervision of a PhD project.

#### **3.2.1 Required Number of Supervisors**

Joint supervision of PhD thesis work is a welcome idea from the School of Graduate Studies of our University. This practice if properly observed should attract a couple of advantages. For sure, exchange of ideas is encouraged. A total number of 2-3

supervisors is adequate. In an ideal situation, joint supervision will involve the following activities:

- i. Regular meetings between the supervisors & the Supervisees/Research students;
- ii. Assignment of duties amongst the Supervisors;
- iii. The 1<sup>st</sup> or lead supervisor should be the most senior and to chair all meetings and direct actions.
- iv. The supervisee on his/her part ensures that he/she communicates with all supervisors on progress reports; and
- v. Finally, all supervisors should proof- read the thesis and equally guide the Supervisee to write manuscripts for journal publications.

### **3.2.2 Poor communication in Joint Supervision**

A situation where supervisors do not hold regular meetings with supervisees and fail to assign duties among themselves will lead to the supervisee visiting supervisors individually which is counter-productive, as it encourages counter instructions and unproductivity. This is what to expect when communication amongst the supervisors and supervisee is missing. We have to watch out as this poor or lack of communication in joint supervision yields poor rating in R&D. We should not be seen as enemies of joint supervision, rather as advocates with team spirit in this regard.

### **3.2.3 Interdisciplinary Joint Supervision**

There is more to gain in interdisciplinary Research. It plays a dominant role in knowledge sharing and can translate to production of hybrid models/products. I've benefitted from joint supervision of Post- graduates in

Toxicology/pharmacology as a Civil & Environmental Engineer with strong background in mathematical modelling & data analysis. The assignment was made simple by regular meetings and division of Research work into two, namely:

- i. Laboratory experiments were overseen by a Toxicology/ Pharmacology supervisor; and
- ii. Statistical data analysis by me (the data analyst); but joint publications were facilitated by supervisee and supervisors. Over 20 No. articles were published in Elsevier & other reputable journals in the course of joint supervision. Apparently, any broad- minded Researcher definitely will encourage our young lecturers to get involved in joint supervision in the same field or interdisciplinary areas for sake of mentorship gains from more experienced Researchers.

### **3.2.4 Accredited Project Supervisor**

The concept of Accredited Supervisor is not yet practiced in Uniport but very popular at the University of Nigeria, Nsukka (UNN). This is an experience I gained as their External Examiner for 22 years. Accredited Supervisor is a product of mentorship exercise. Herein, a prospective supervisor in the rank of Senior Lecturer, Reader or Professor is only permitted to supervise a PG student as an accredited project supervisor when he/she has benefitted from joint supervision headed by an experienced & accredited supervisor colleague. This process of mentorship ensures that due process and sensitization are achieved, and thereafter the mentee supervisor becomes Accredited Supervisor and thus, can mentor others. The cycle

is completed and equally repeated to reduce or eliminate poor supervision that impacts on quality of Research output.

There are good reasons to adopt this practice at least at the Departmental level for sake of efficiency in our University (Uniport).

#### **4. PROFESSORS IN NIGERIAN UNIVERSITY SYSTEM**

##### **4.1 Comparative Assessment of Professors in Selected Universities**

It will not be out of place to assert that a professor is the driver of Research and Development in the University System. How prepared are they? Do they have the calling in the first place? Does the promotion guideline of a given university affect the quality of its professor? A tabular summary of 10 No. selected universities (1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> Generations) is made available with respect to publication scoring format for promotion of a professor (see Table 2)

For sake of comparison, MNOJA (Minimum Number of Journal Articles) is computed per university, herein we give max. scores to journal articles, as specified by individual universities. That means, for a professorial candidate in Uniport with a total score of 60 points and maximum journal score of 3 points per Article requires 20 No. articles for his or her promotion. Similar computations for other universities are as shown in column 4 of Table 2.

The distribution of MNOJA for the ten selected Universities by ranking places Federal University of Agriculture, Makurdi in

the first position (MNOJA= 35), 2<sup>nd</sup> and 3<sup>rd</sup> positions are UNILORIN and UNN (MNOJA= 24 & 22), respectively; while ABU, UNIPORT and RSU took the 4<sup>TH</sup> position (MNOJA= 20). Finally, UNIUYO, UI, OAU and FUA-Abeokuta took the 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> positions (MNOJA= 15, 14, 10, 7), respectively.

The non-uniformity in the distribution of MNOJA for various Universities in Nigeria is as a result of autonomy granted to the university system. There is need for some level of harmonization by reviewing other universities' appointment and promotion guidelines. One may ask why are some professors not invited to external examination of PhD candidates in premier universities or in the assessment of professorial candidates? The answer to this: When the resume of a professor is reviewed by others and it is lacking publication-wise; that is, his publications cannot attract h-index value of at least 10. Apparently, such a professor is lacking in what it takes to drive Research & Development to an enviable level. In essence, such professors have no calling in R&D.

**Table 2: Non-uniform promotion guidelines in Nigerian university system**

S/No.	University	Guideline For Scoring Publications	Mnoja <sup>+</sup>
<b>First Generation Universities</b>			
1	UNIVERSITY OF NIGERIA NSUKKA (UNN)	Books, journals, chapter in a book, & conference papers are classified into letter Grades: A, B, C, D, E, & F with corresponding scores according to no. of authors, for class-A, single, up to 3 authors & more than 3 authors are 3.0, 2.5 and 1.5. For other letters B, C, D, E& F, the corresponding scores are reduced by a factor of 0.5. Min. Total scores for Professor= 65 pts; Reader= 60pts & Snr Lect.= 40pts.	<b>65/3 = 22 articles</b>
2	UNIVERSITY OF IBADAN (UI)	Max. score for edited book/patent = 10pts. Chapter in book = 3pts and Refereed conference paper = 2pts; Max. score for journal articles; full length =5pts, short communication/review paper = 3pts. Guidelines is silent on score distributions for lead and co-authors in joint publication. Min. total scores for SL = 20pts, Reader = 50pts, Professor = 70pts, respectively.	<b>70/5 = 14 articles</b>

3	OBAFEMI AWOLOWO UNIVERSITY (OAU)	Max. score for referred Journals/conference Proceedings = 5 pts per paper. Max. score for referred book or patent= 10pts distributed as Excellent= 100%, V. Good= 80%, Good= 60%, V. Fair= 40%, Fair= 20% and Poor= 0, respectively. Joint Authorship (for Readers & Professor): 40% of Publications as lead or sole author. Distribution of publications: Local= 20%; National= 40% & Int'l= 40%. Min. total scores for Professor= 50 pts; Reader= 40pts & Snr Lect.= 30pts.	<b>50/5 = 10 articles</b>
4	AHMADU BELLO UNIVERSITY, ABU	Max. Score for Journal Article = 2pts. NB: Acceptable Journals Include: a) those published by universities, professional Bodies & Int'l indexed/E-journals. Max. score for an edited conference proceeding = 1.0pt; Max. score for a chapter in a book = 1.0pt up to 2 chapters. Max. score for a book = 4points Min. total publication scores for SL = 30pts; Reader = 35pts and Professor = 40pts	<b>40/2 = 20 articles</b>
<b>Second Generation Universities</b>			
5	UNIVERSITY OF PORT HARCOURT (UPH)	Max. score for journal article= 3pts; Conference= 1pts; Book= 5pts. Score Distribution: Lead author= 60%; Co-author (for 3 or more) = 40% each. Min. total scores for	<b>60/3 = 20 articles</b>



		SL = 30; Reader = 50; Professor = 60 points, respectively.	
6	UNIVERSITY OF ILORIN (UNIILORIN)	Max. Score for Journal Articles = 3pts. Lead author 100% & co-authors = 70% each. Book- Max. Score for a book = 5pts. Predatory Journals not scorable! Max. Score for a chapter in a book = 2pts. Max. Score for conference proceeding = 1pt for max of 3 papers. Min. Total publication scores for Prof = 72pts, Reader = 60pts & Snr. Lecturer = 40 pts	<b>72/3 = 24 articles</b>
7	RIVERS STATE UNIVERSITY (RSU)	Max. score for J. article= 3pts for 1-2 authors, 1pt for 3 authors & ½ pts for 4 authors, Conference Proceedings= 1pt for 1-3 authors, & ½ pts for 4 authors Max. score for Book = 3 for 2 authors, 1 pts for 3 authors & ½ pts for 4 authors. Min. Total score for SL = 30; Reader = 50; Professor = 60 points, respectively.	<b>60/3 = 20 articles</b>
Third Generation Universities			
8	UNIVERSITY OF UYO (UNIUYO)	Max. score for journal = 4pts, conf. paper = 2pts & book= 8pts. Guidelines is silent on score distribution for lead author & co-authors. Min. Total Publication scores for Reader = 50pts & Professor = 60pts	<b>60/4 = 15 articles</b>
9	FEDERAL	Max. score for Journal Articles:	

	UNIVERSITY OF AGRICULTURE, ABEOKUTA	Foreign Grade A = 4.0 pts, Grades B = 3.5pts, Grade C = 2.5pts, Grade D= 1.5pts for lead author & 70% to co-authors). Local Journals owned by society or Univ. = 3.5pts; Fac/Dept = 3.0pts; Private = 2pts for lead authors & co-author(s) = 70%. Max. score for Book= 5pts for Lead author & 70% for co-author(s) Min. Total Score for SL = 14pts; Reader= 21pts & Professor = 28pts	<b>28/4 = 7 articles</b>
10	FEDERAL UNIVERSITY OF AGRICULTURE, MAKURDI	a) Max. score for Journal Article (Local/Int'l) = 2pts to Lead Author & 50% to co-author(s); Max. score for conference Proceedings = 1pts for 1-3 authors & ½ pts for 4 authors. Max. score for Books = 5pts for up to 3 authors & 3pts for 4 authors. Min. Total Publication scores for SL = 55pts; Reader = 65pts & Professor = 70pts.	<b>70/2 = 35 articles</b>

<sup>†</sup>MNOJA =Minimum Number of Journal Articles.

## **5. WORLD UNIVERSITY RANKING vs R&D**

### **5.1 Times Higher Education Ranking of 2015/2016**

The university of Port Harcourt ranked 1<sup>st</sup> in the league of Nigerian universities and ranked 3<sup>rd</sup> for African Universities (Times Higher Education, 2016). This was not surprising given the foundation in research advocacy laid by the 7<sup>th</sup> Vice Chancellor via centres of excellence to promote, advance and sustain the spirit of Research and Development. Unfortunately, this spirit lasted only a short while with limited motivation. That explained Uniport's low ranking in subsequent years.

The University of Oxford, UK that came 2nd in the world on the Times Higher Education world university ranking encouraged all university researchers to promote their work through publishing via journals with rigorous standards of peer review (University of Oxford Research Support, 2016). This ranking exercise has awakened universities to the challenge of publishing research outputs, thus, promoting the culture of dissemination of research findings through Journals and conference proceedings for others to read and cite. Scoring is based on quality and quantity of research outputs published as contribution to knowledge; see also, Section 6.1 on Publish or Perish for more emphasis.

With respect to MNOJA values in Table 2, one will expect that the universities with higher MNOJA values will produce the best professors in R&D; but this is not always the case. Comparatively speaking, the universities with high MNOJA scores in Table 2 are not among the best world ranked

universities (see Table 3). For instance, Federal University of Agriculture, Makurdi has an MNOJA value of 35 and a RPN of 10 while University of Ibadan has MNOJA value of 14 but is ranked 1 in Nigeria.

The competition amongst the universities for top position is fierce and can be seen in rise and fall of ranking positions of individual universities annually (see Table 3). For local universities in Nigeria, the question is this: is there anything university administrators can do to help matters? How about assisting researchers on Journal publication charges in reputable Journals and/or attracting fund from industry or Education Trust Fund (administered by Government Agency) to support research and publication.

**Table 3: World University Ranking by Google Versus Times Higher Education**

Year	By Google, 2022 Selected Nigerian Universities (1 <sup>st</sup> , 2 <sup>nd</sup> & 3 <sup>rd</sup> Generations)										
	RP <sup>*</sup>	UI	OAU	UNN	ABU	UPH	UNI-LORIN	RSU	UNI-UYO	FU AGRIC ABEO-KUTA	FU AGRIC MAR-KUDI
2022	RPW	1231	1477	1622	2262	1923	3533	4572	3432	4210	5619
	RPA	19	27	30	53	44	131	206	120	182	267
	CITATION	72,358	33,258	28,689	N/A	7,760	12,811	1,449	6,196	NIL	NIL
	RPN	1 <sup>ST</sup>	2 <sup>ND</sup>	3 <sup>RD</sup>	5 <sup>TH</sup>	4 <sup>TH</sup>	7 <sup>TH</sup>	9 <sup>TH</sup>	6 <sup>TH</sup>	8 <sup>TH</sup>	10 <sup>TH</sup>
	h-index	81	61	52	N/A	36	39	17	34	N/A	N/A

**BY TIMES HIGHER EDUCATION, 2022**

RPW	1207	385	1498	2244	1514	259	4792	482	4139	508
RPN	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	5 <sup>th</sup>	4 <sup>th</sup>	6 <sup>th</sup>	9 <sup>th</sup>	7 <sup>th</sup>	8 <sup>th</sup>	10 <sup>th</sup>
<b>SOURCE: WEBOMETRICS, 2023</b>										
RPW	1207	1385	1498	2244	1514	3259	4792	3482	4139	5508
RPN	1 <sup>ST</sup>	3 <sup>RD</sup>	4 <sup>TH</sup>	8 <sup>TH</sup>	5 <sup>TH</sup>	17 <sup>TH</sup>	37 <sup>TH</sup>	22 <sup>ND</sup>	30 <sup>TH</sup>	47 <sup>TH</sup>

**\*Rank Position out of Best 100 Nigerian Universities**

**Abbreviations: RP: Rank position; RPA: Rank Position Africa; RPW: Rank position worldwide; RPN: Rank Position Nigeria**

## **6. PUBLISH OR PERISH IN R&D**

### **6.1 The Concept of Publish or Perish**

Publish or perish is a free software program which uses Google Scholar citation data to compute the impact metrics such as h-index, g-index, 110-index (i.e., individual publications exceeding 10 citations) and others. The main focus is on author's impact, etc. The software was developed by Dr. Anne-Wil Harzing of the University of Melbourne. It must be downloaded from Harzing's web pages (it is free access).

Google scholar Publish or perish (GSPOP) is a publication search machine that promotes high class publications in reputable journals. It has been in existence for over 80 years now. Since 1942, GSPOP has bridged the gap between academic and research publications (Garfield, 1996). According to Fanelli (2010) there is need for the academia to establish, sustain and improve the career of an academic through research and publication or perish (i.e. no promotion, no recognition or no research grants). Publishing in low quality, predator journals and conference proceedings, where low quality peer review is practised would contribute to the perishing of the researcher than to his/her growth.

Invariably, the ranking of a researcher nationally (or globally) is dependent on his h-index which is computed with respect to the total citations on his publications. So, your visibility in research and development is dependent on your ability to publish in reputable journals.

## **7. CONTRIBUTION TO KNOWLEDGE (CTK)**

### **7.1 Introduction**

As a senior academic involved in post-graduate lectures and project supervision with respect to thesis documentation and technical report writing, I was privileged to benefit from many discussions on what constitutes contribution to knowledge during project defence which till 2010 remained an unresolved issue. The commencement of lectures for PG students at the Centre for Occupational Health, Safety & Environment (COHSE) in April 2011 and later in 2014 at the World Bank African Centre of Excellence in Oil Chemicals (ACE-CEFOR) gave new impetus to the proper definition/explanation of contribution to knowledge (see Section 7.2). A number of colleagues believed that contribution to knowledge is all about making discovery or breakthrough in a new frontier of knowledge in any area of specialization.

Funded research for all purposes and intent is to solve a practical problem for Industry or Agency for the benefit of mankind. Here in Nigeria, tertiary institutions hardly benefit from sponsored or funded research by industries and government agencies. Post-graduate students bear the cost of their research projects. Apparently, about 60% of research projects by students in Nigeria is to actualize the process of conducting a study similar to a feasibility study, wherein the researcher identifies the aim & objectives, performs data collection & analysis, leading to recommendation. This is a process usually adopted in carrying out any funded research whose outcome can be put to economic use, production by

industries, etc. However, student-sponsored research satisfies the requirement for graduation and the outputs are hardly commercialized; why is it so? The reason is not far-fetched, industries and government are not involved.

## **7.2 CTK By Definition**

What is contribution to knowledge? This may come in three different forms namely: - invention, innovation and record of information not available in literature or to authenticate available information (Nwaogazie, 2024). Invention is more of a technical term-discovering something that is not in existence (for instance the discovery of steam engine, aeroplane, computer, telephone, etc) or the process of inventing. To invent is to produce (something, such as a useful device or process) for the first time through the use of the imagination or of indigenous thinking and experiment.

Innovation implies making changes or alterations to anything already established; bringing in new ideas, methods, or novelty. For example, the first brand of standing fans is 3-blades while the second generation/brand is 2 – blades-a case of innovation.

The third aspect of contribution to knowledge has to do with research or study that documents result or finding(s) that are not available in literature or seems to support existing knowledge in literature (Nwaogazie, 2024). For instance, a study on rate of reoxygenation in Imo River at Oyigbo station is established and documented; the researcher has taken credit in his finding. However, a similar study can be repeated at a nearby river; say Otamiri in Owerri city, whether the result is



same or not to that of Imo River at Oyigbo is immaterial. We note that prior to the repeated study at Otamiri river, we have no knowledge of the result as it is not available in literature.

Once the second study confirms similar or dissimilar result with that of Imo River, that information becomes a contribution to knowledge because we can refer to it in our future discussion on the subject. It is supported as an outcome of a research/study. In effect, information arising from a study that adds value to what is or is not in literature, which we can refer to in future, is a CONTRIBUTION TO KNOWLEDGE.

### **7.3 CTK By Gap Analysis**

Gap analysis in literature review is an excellent approach for post-Graduate students on hunt for research topics to identify research gaps in published research works available in literature (Nwaogazie, 2024). The prospective researcher carries out a form of 'review work' in area of interest for instance: - climate change modelling; renewable energy alternatives and solid waste conversion to activated carbon generation.

The literature review exercise may settle for a specified period of time, say 10 to 50 years (Nwaogazie et al., 2021; Akomah, 2021): A typical format is always in a tableau (see Table 4). The last column lists the identified gaps for the given research area. Any of the gaps filled by reason of carrying out a study on it contributes to knowledge.

Our PhD aspirants are encouraged to tow this line of least resistance for contribution to knowledge. Invariably, gap

analysis gives credence to item (iii) in Section 7.2, any filled gap comes with it finding(s) not yet available in literature and thus, is taken as contribution to knowledge.

**Table 4: A Typical Example of Gap Analysis of Fire Hazards in Market Place**

S/N	Author	Research Title	Contributions	Gaps
1.	Elenwo et al. (2019)	Risk and Vulnerability of Markets to Fire Incidents in Port Harcourt Metropolis Rivers State, Nigeria	The study identified electrical faults, stored fuel or other inflammable substances, inordinate desire to make quick wealth by individuals, lack of knowledge on use of fire protection devices and gadgets and careless disposal of lighted cigarette and matches as factors responsible for frequent fire outbreaks in the markets	The study did not consider human errors such as ignorance, carelessness and sabotage on the part of traders and market masters as other major causes of market fires.
2.	Iodiuba et al. (2017)	Awareness Assessment of Hazardous	The authors assessed the major hazardous	The authors did not consider the human

		Activities and Effects on Market Fire in Nigeria.	activities that could lead to market fires as electrical problems, smoking, storing fuel, leaving appliances switched on after use, waste burning, non-restaurant cooking, driving and parking of vehicles, putting on generator sets and children playing with electrical appliances.	decisions and organizational failures that contribute to market fire disasters
3.	Twum-Barima (2014).	An assessment of the awareness of fire insurance in the informal sector: a case study of Kumasi central market in Ghana	The authors listed possible causes of fire outbreak in Kumasi Central Market which include; power fluctuations, cooking with naked fire, overloading of electrical appliance, improper and old electrical wiring system, illegal	The study did not consider other causes of fire outbreak in the market like arson and human error.

			tapping of electrical power from the national grid, use of substandard electrical materials and use of defective generators	
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## 8. CONCLUSION

The Prospect of R&D in the Academic Environment is anchored on researchability of a research topic, that is based on time & cost. A researchable topic must be evaluated on student affordability basis, given that what is not affordable by one student may be affordable by another. A number of limiting factors contend with R&D in an Academic environment, namely:

Lack of perseverance; Lack of succession plan; tribalism in staff recruitment; lack of team spirit in project supervisions; lack of Accredited project supervisors, the issue of publish or perish, etc.

The non-uniformity of universities academic promotion guidelines in Nigeria is a major factor in the quality of Professors from individual universities. The 1<sup>st</sup> and few amongst the 2<sup>nd</sup> & 3<sup>rd</sup> generation universities in Nigeria seem to excel in world university ranking than others. Competition for top position is very fierce and it is driven by publish or perish principle. The cost of publication should not be borne by authors alone, rather the university administration should

support with percentage of its internally generated revenue and/or solicit for external support.

The success story of Uniport in R&D began with the establishment of Centres of Excellence for the training of post-graduate manpower. The World Bank African Centre of Excellence has to its credit 150 PhD graduants between 2014-2019. The COHSE is 2<sup>nd</sup> in PhD graduation with 60 graduates between 2017-2023.

Finally, the issue of contribution to knowledge is tied to invention, innovation and largely on publication of research output in peer reviewed journals and conference proceedings which are available in literature.

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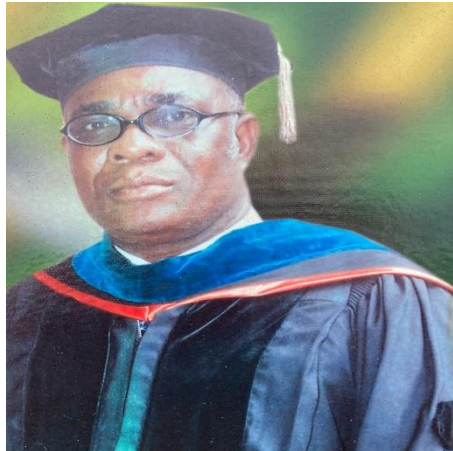
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## CITATION ON



**PROFESSOR IFEANYICHUKWU (IFY)  
LAWRENCE NWAOGAZIE**  
BS, MS (Kansas), PhD (Oklahoma State)  
**Professor of Civil Engineering**

Professor Ify L. Nwaogazie was born on July 27, 1954, at Umuosike Lorji in the present day Aboh-Mbaise Local Government Area (LGA) of Imo State. His parents were Mr. Emmanuel Nwaogazie Okwuonu and Mrs Mabel Appolonia Okwuonu (Nee Nwachukwu of Chokoneze, Ezinihitte-Mbaise LGA), both of blessed memory. His father was a carpenter specialized in building of lorries while the mother was a peasant farmer.

Prof. Nwaogazie finished his primary school in 1966 at Lorji Central School. Due to the Nigerian Civil war His entry to secondary school was delayed. However, he attended win the war school briefly and completed his secondary education at Ife Grammar School, Ezinihitte-Mbaise LGA in 1974. He

obtained his West African School Certificate (WASC) in Division one in 1974.

Prof. Nwaogazie entered Alvan Ikoku College of Education, Owerri to study Maths-Physics Education in 1974. Shortly afterwards, he obtained Federal Government Scholarship to study BS Water Resources Engineering overseas. He commenced his undergraduate programme in Civil Engineering at University of Kansas, Lawrence, Kansas in October, 1976 and graduated in January, 1979 and equally completed his MS programme in Water Resources in Oct., 1980. Thereafter, he commenced his PhD programme in October, 1980 and graduated at Oklahoma State University in Stillwater in July 1982. Apparently, he got all his degrees within six years period in the USA.

As an erudite scholar in mathematical modelling of engineering systems, Prof. Nwaogazie was the first to develop Finite Element software for flood predictions in 1982 in USA and this was published in American Society of Civil Engineering, hydraulic division in 1984. He was appointed as a Research Associate/Assistant Professor in Civil Engineering Department, a position he held from July 1982 to September 1983.

Prof. Nwaogazie joined the services of University of Port Harcourt on October 1<sup>st</sup>, 1983 as a Lecturer-I. Having been interviewed in New York with Late Professor Chi U. Ikoku as one of the interviewers who influenced his coming to UNIPORT as against FUTO that sponsored the interview. As a pioneer staff of Civil Engineering Department, they were 2

lecturers Dr. Arumala and Dr. Nwaogazie both were lecturer 1 at that time that began the development of the undergraduate program. Professor Nwaogazie rose through the ranks and became Senior lecturer in 1986 and Professor of Civil Engineering in 1996. In effect, he became Professor at age 42. He was privileged to benefit from British Council three months research sponsorship at the University of Newcastle-Upon-Tyne in 1986. Also, he was a beneficiary of research grants by Royal Society of London to carry out a twelve-month research study at the University of Newcastle-Upon-Tyne in 1989-1990. Prof Nwaogazie had held various positions in the course of his duty here at the University of Port Harcourt, namely:

- (i) Member, Department of Civil Engineering Committee on Curriculum Development, undergraduate program first draft (1983 –1984), revised programs (1987 and 1996) and post-graduate programs (1997);
- (ii) Acting Head of Department of Civil Engineering, (1987 –1989);
- (iii) Coordinator, Faculty Post-Graduate Programs: Masters of Engineering Management, (1991–1994) and Masters of Environmental Engineering (1998 – 2000);
- (iv) Member, University Senate, (1986 – 1995 as Faculty Rep.; and full Senate Member, from 1996 to 2024);
- (v) Member, University Science and Engineering Workshop Committee, (1986 –1988);
- (vi) Member, University Time-Table Committee, (1984 – 1987) and Chairman (1987 – 1988);
- (vii) Member, University Graduate School Board, (1986 – 1987; 1991 –1994 and 1998 – 2002);
- (viii) Dean, Faculty of Engineering, (2000 – 2002);

- (ix) Director, Science and Engineering Workshop, SEW, (1994 –1996) and
- (x) Member, Development Committee (1994 – 1997; 2000-2002).

Professor Nwaogazie served as a pioneer Director of Centre for Occupational Health Safety and Environment (COHSE) between 2010-2015. Inspired with the vision of Centre sustainability, he was able to design and construct a 14-room office and classroom building for the Centre by direct labour. This is a model for Centre Directors to emulate in the spirit of sustainability and to be less dependent on external support that can expire unannounced.

Through Research & Development, Professor Nwaogazie has contributed to knowledge in the areas of teaching and learning in general Civil Engineering and more particularly in Water Resources. As a supervisor and mentor, Prof. Nwaogazie has supervised over 50 undergraduate projects in Civil & Environmental Engineering; 105 Masters Dissertation in Civil, Environmental, MEM and COHSE programs and about 40 PhD Thesis research work. In the area of publications, Prof. Nwaogazie has to his credit over 200 Journal articles, 3 text books, inaugural lecture on “Water Supply for All – Who Cares” and 21 chapters in books published by Book publishing of Science Domain International, UK and few conference proceedings. On PhD oral defence and Professorial assessment, Prof. Nwaogazie has examined over 20 PhD candidates in 4 universities and 21 Readership/Professorial assessment from 12 universities Nation-wide. Professor

Nwaogazie's research interest cuts across many disciplines including Engineering, Physical Sciences, Occupational Health, Safety & Environment, Pharmacology/Toxicology, etc. His varied interest in research and development is anchored on his background in mathematical modelling and data analyses expertise.

Prof. Nwaogazie is a fellow of the Nigerian Society of Engineers since 1999; he is a fellow of Institute of Safety Professionals of Nigeria since 2014; and a fellow of Institute of Petroleum Studies (IPS) since 2015. Prof Nwaogazie is a member of Chi Epsilon Association - National Civil Engineering Honours Society, USA (1978); member, Tau Beta Pi Association, National Engineering Honours Society, USA (1978). He is a consultant to many local and multi-national organizations in EIA & erosion studies, flood mitigation, water supply, coastal protection, wastewater treatment plant design, modelling and establishment of climate change existence in Niger-delta & other parts of Nigeria.

Professor Nwaogazie is a born again Christian and an Evangelist, involved in organizing Evangelism, Crusades and in training of Christians on Community Deliverance and Demonology. He is happily married to Dr. Mrs Anne Nwaogazie and they are blessed with five children – Engr Anyi, Dr Uche, Amara (HR consultant), Engr Uzo and Somto (Data analyst), and five grandchildren to date.

**Professor Owunari Abraham Georgewill**  
**Vice Chancellor**