

"WHY DO I HAVE TO DO RESEARCH? QUESTION STUDENTS' OFTEN ASK"

A Motivational Speech Presented by Professor I.N.S. Dozie, Dean School of Health Technology, Federal University of Technology Owerri at the Occasion of the FUTO Students Research and Innovation Expo (FUTO STRIVE) Organized by the Centre for Research & International Development (CRID) held on November 2, 2016

1.0 Preamble

It is with deep humility and a sense of purpose that I stand before you today to serve as a **Speaker** at the 2016 FUTO Students Research and Innovation Expo (FUTO STRIVE) organized by the Centre for Research and International Development (CRID).

FUTO STRIVE is another platform for students to share their research with the University community, developers, private sector, government and the public. It is significant that this activity is in tandem with Students Innovation and Fairs which are part of University culture worldwide especially in the developed economies. I wish to thank the Director of CRID, **Professor Emeka Oguzie** and his team for conceptualizing this academic activity and translating it into reality and for finding me worthy to deliver this lecture in the midst of other distinguished academics who abound in our great University. This exercise is a deep testimony to keeping faith with the implementation of the mantra of the current administration, **"Driving the Culture of Excellence"** as envisioned by our cool, calm, collected and amiable Vice-Chancellor, **Professor Francis C. Eze**.

I was asked to speak on the topic; **"Why do I have to do research? Question students' often ask"**. I will attempt to discuss this topic in a "few" minutes and hope that the audience and indeed our students' representatives at this Fair will benefit from this lecture and become convinced on why they should continue to do research.

2.0 Definition of Concepts: Research, Innovation and Entrepreneurship

a. Research from a layman's perspective, is a process of careful inquiry leading to the discovery of new information. However, the Merriam-Webster Online Dictionary defines research in more details as *"a studious inquiry or examination; especially investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted*

theories or laws in the light of new facts, or practical application of such new or revised theories or laws". Taking multiple forms, research includes scholarly and creative activities that can lead to new knowledge, improve our ability to solve problems, result in new theory, and/or in the creation of new art or an artistic performance. The academic community maintains communication with the world through research and community service.

b. Innovation according to Wikipedia, the Free Encyclopedia is defined simply as a "*new idea, device, or method*". However, innovation is often viewed as the application of better solutions that meet new requirements, unarticulated needs, or existing market needs. This is accomplished through more-effective products, processes, services, technologies, or business models that are readily available to markets, governments and society. Despite the different definitions of innovations by experts, what is fundamental to all is that; innovation is about nursing an idea, executing an idea, addressing a challenge, thinking from a different perspective, adding value etc.

c. Entrepreneurship according to Wikipedia has traditionally been defined as the process of designing, launching and running a new business, which typically begins as a small business, such as a startup company, offering a product, process or service for sale or hire, and the people who do so are called '**entrepreneurs**'.

It is notable that the trio of **research, innovation and entrepreneurship** as well as **human capital** are the drivers of development in all knowledge-based economies of the world. This is captured in the theme of 2016 FUTO STRIVE; "***Promoting knowledge-based development through research, innovation and entrepreneurship***". The Asian Tigers namely Japan, China, South Korea and Taiwan are typical examples of countries that have achieved economic prosperity through research, innovation and entrepreneurship based on quality human capital. They belong to the "trillion dollar" club with the exception of Taiwan. For example, Japan rose from the ruins of the World War II to become the third leading economy in the world in terms of nominal GDP (\$4.73 trillion) and fourth in terms of GDP by purchasing power parity (PPP). China on the other hand has transformed from a centrally planned closed economy in the 1970s to a manufacturing and export hub over the years. It is the second largest economy in terms of nominal GDP (\$11.3 trillion) and first largest economy based on GDP by PPP (\$21.3 trillion) as against US (\$18.5 trillion). The solid growth and development of the economies of South Korea (\$1.4 trillion) and Taiwan (\$519.6

billion) are good lessons for countries from the developing economies of the world. From another perspective, Israel established in 1948 in an arid desert region with no oil is a major economic power because of research, innovation and entrepreneurship. With a population of about 7 million people and GDP of USD 311.7 billion, Israel is a world leader in telecommunication, software, encryption and data security, electronics, agro-technology, biotechnology, optics, internet, nanotechnology etc. Israeli as the 35th biggest economy in the world is richer than her oil-rich Arab neighbours with the exception of Iran (GDP is \$412.3 billion) and United Arab Emirates (GDP is \$375.0).

3.0 Why do I have to do research? Question students' often ask.

In the Nigerian context, students usually do not see reasons why they should conduct research. Research is perceived by students as a means of fulfilling a requirement for graduation, just in the same way practical classes are perceived to be a fulfillment for passing a course. Research is usually done just to produce the final thesis/project necessary for graduation. This notion therefore, defeats the aim for research projects and makes the process an unserious one as students produce their projects/theses through several means including hiring people to perform laboratory experiments and write their thesis (which is impersonation, a gross misconduct) or copying other peoples' work (which is plagiarism, a serious offence in the academic community). Research should go beyond this vague perception, since it is a vital part of the learning process both for undergraduate and postgraduate students. This poor attitude to research especially at undergraduate and postgraduate levels is partly the reason why many of our universities do not have many innovations.

In the developed countries, where there is an entrenched research culture in the universities supported by a conducive research environment, a lot of innovations that have contributed to societal development are derived from or initiated at students' research level. Therefore, research among students is something that should be taken very seriously because at that stage there is a **lot of energy** and **the quest to discover** due to **sharpness of the young mind**, which learns quick and acts quicker.

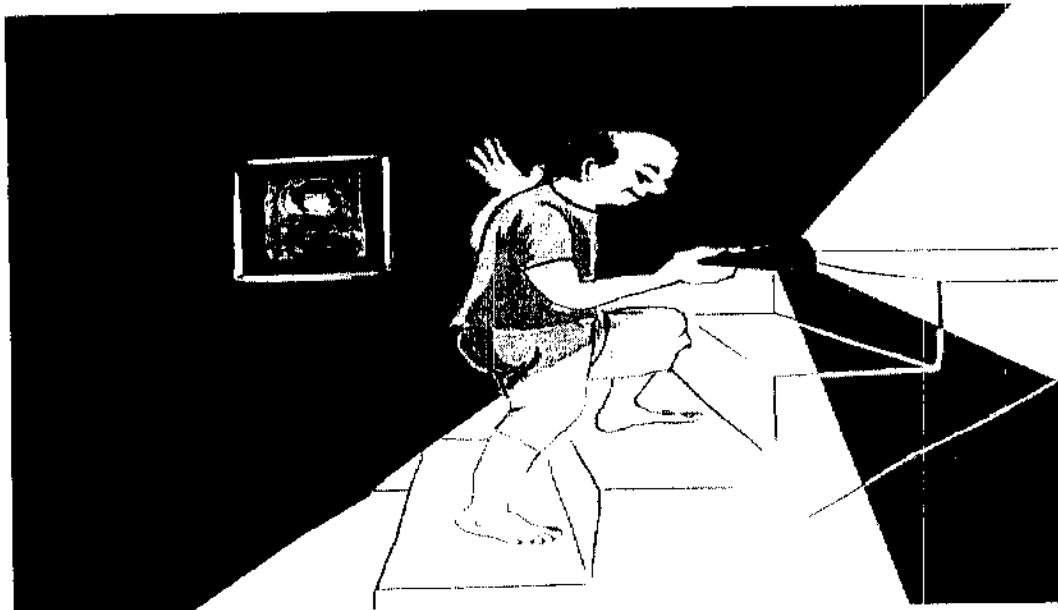
a. Some Innovations by Foreign Students

The IGNITE competition held by the National Innovation Foundation of India is a platform that gives young minds the opportunity to experiment and innovate, and come up with something extra ordinary. Having started with receiving less than 1,000 entries five years ago, the competition now receives over 20,000 entries from 301 districts in India (www.thebetterindia.com/11596/ignite-innovations).

Below are some interesting and impressive innovations by students of various schools across India are worth knowing and applauding

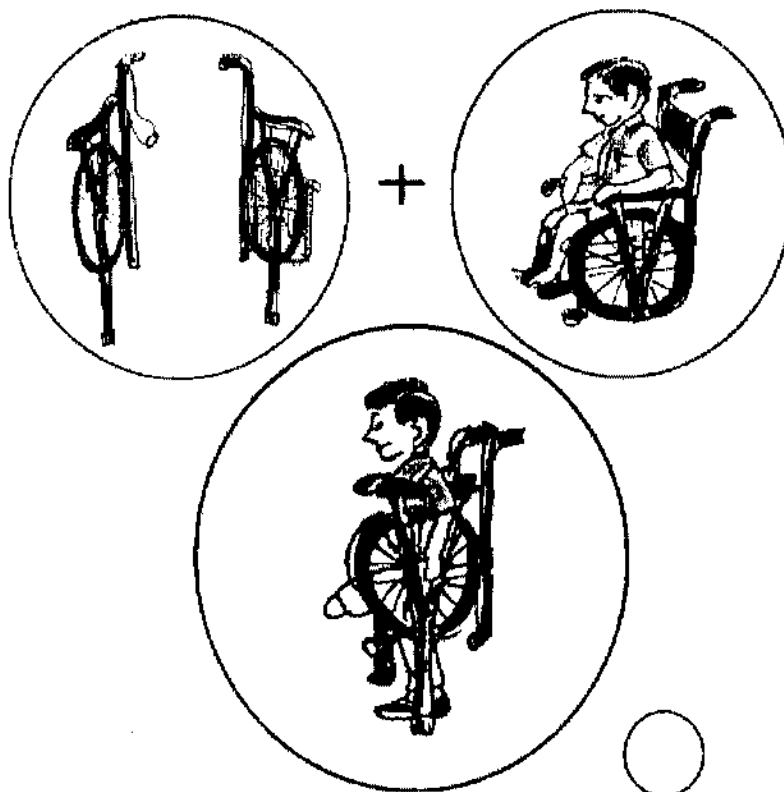
a. A torch with an additional bulb

The idea is to have another bulb below the main bulb of the torch so that light is available near the feet of user and also for people following the user. The idea was conceived by Alisher MD (Class 12, KSS College, Lakhisarai, Bihar) who once was returning home with his grandmother at night and fell into a pit. He was using his torch to show his grandmother the way and he could not see a pit himself and fell into it.



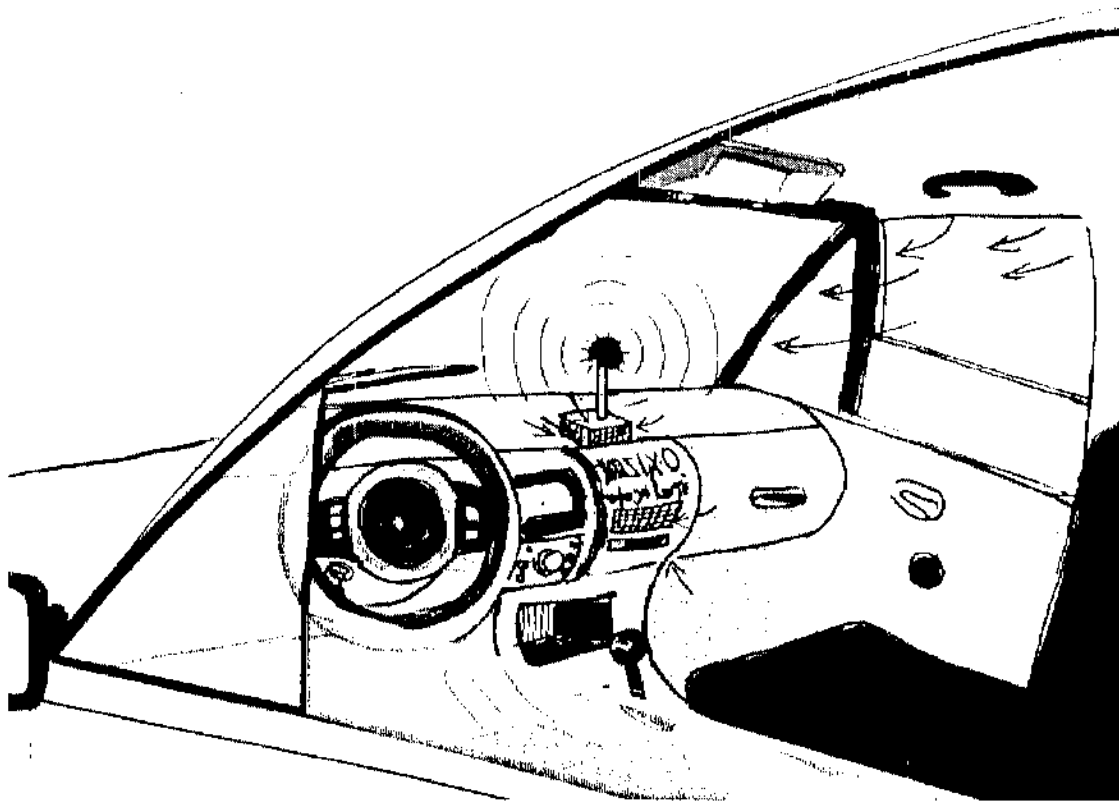
The idea was to have another bulb below the main bulb of the torch so that light is available near the feet of user and also for people following the user.

d. Wheel chair convertible to crutches



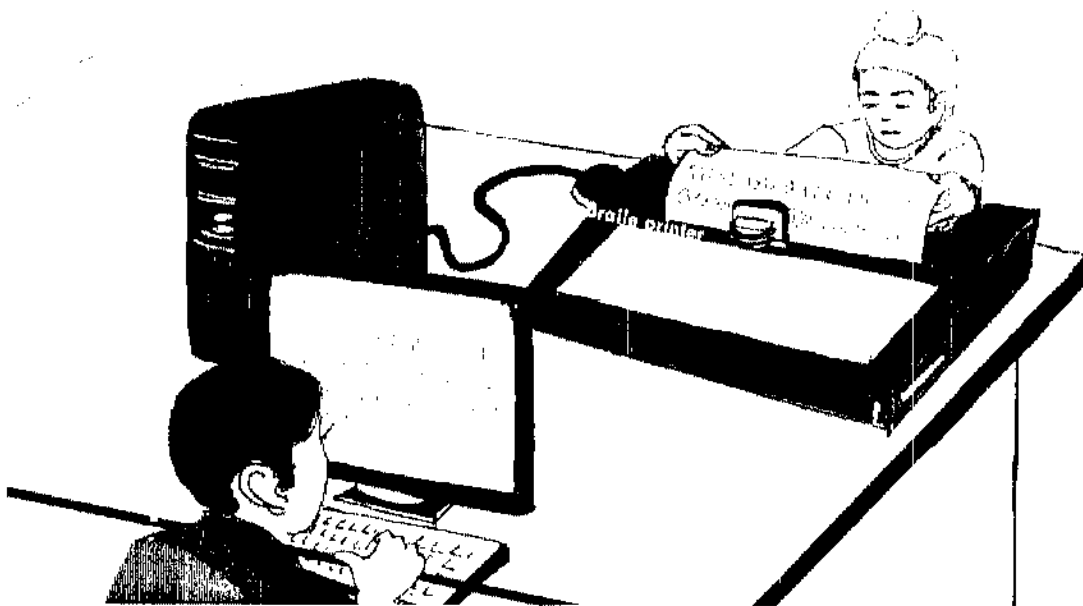
The idea developed by *S Ramakishore, Sanjay Srinivas, Tamil Selvan class 10, Maharishi International School, Chennai, Tamil Nadu* was to have a modified wheelchair that can be folded and converted into a crutch so that it is easy to take on stairs as well use on flat surface. The three friends had gone to celebrate one of their friend's birthday in an orphanage. They were moved by the plight of lower limb physically challenged.

c. Oxygen /carbon dioxide level indicators in car



This is a system designed by *S R Valava*, (Class 12, AEHSS, DAE Township, Kalapakkam, Tamil), *Nadu Pratyush*, *Kumar Sahoo* & *Bikash Kumar Mallick* (class 10, Mother Public School, Khurda, Odisha) to detect levels of oxygen/ carbon dioxide in the closed car and open windows when the oxygen level drops or carbon dioxide level rises, thereby preventing accidental deaths of children or pets locked inside the car. All the students thought about this idea after reading/hearing news about accidental deaths in cars due to suffocation.

a. Low cost Braille printer



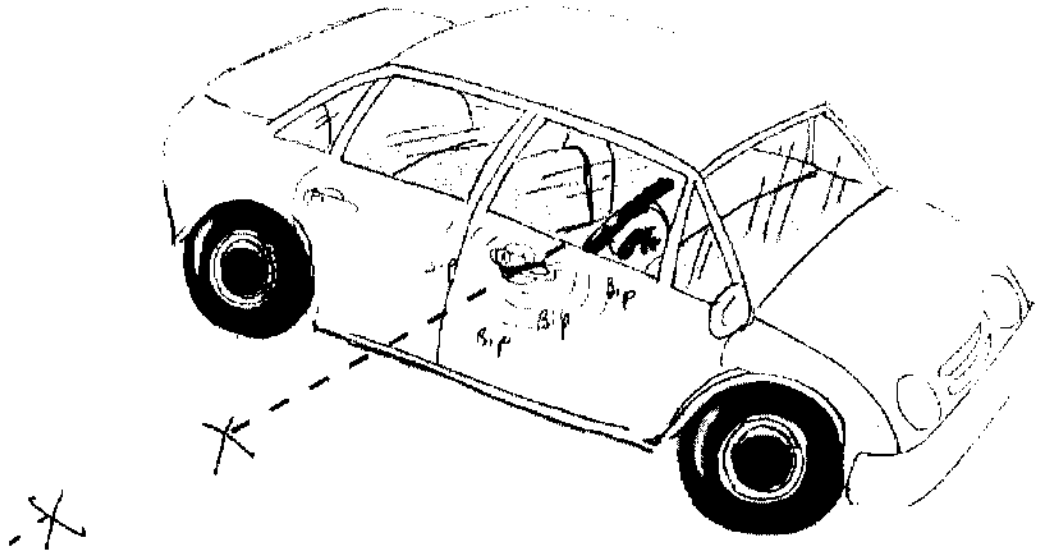
A dot matrix printer modified at a low cost to work as a Braille printer developed by *Santokh Singh and Khushwant Rai*, class 12, Police DAV School, Jalandhar, Punjab. Both the friends once visited a blind school for a school project where they saw much of the printing work done in a time consuming manual manner. Challenged by a teacher there, they came up with their own Braille printer using a dot matrix printer.

e. Step-lock system in bus



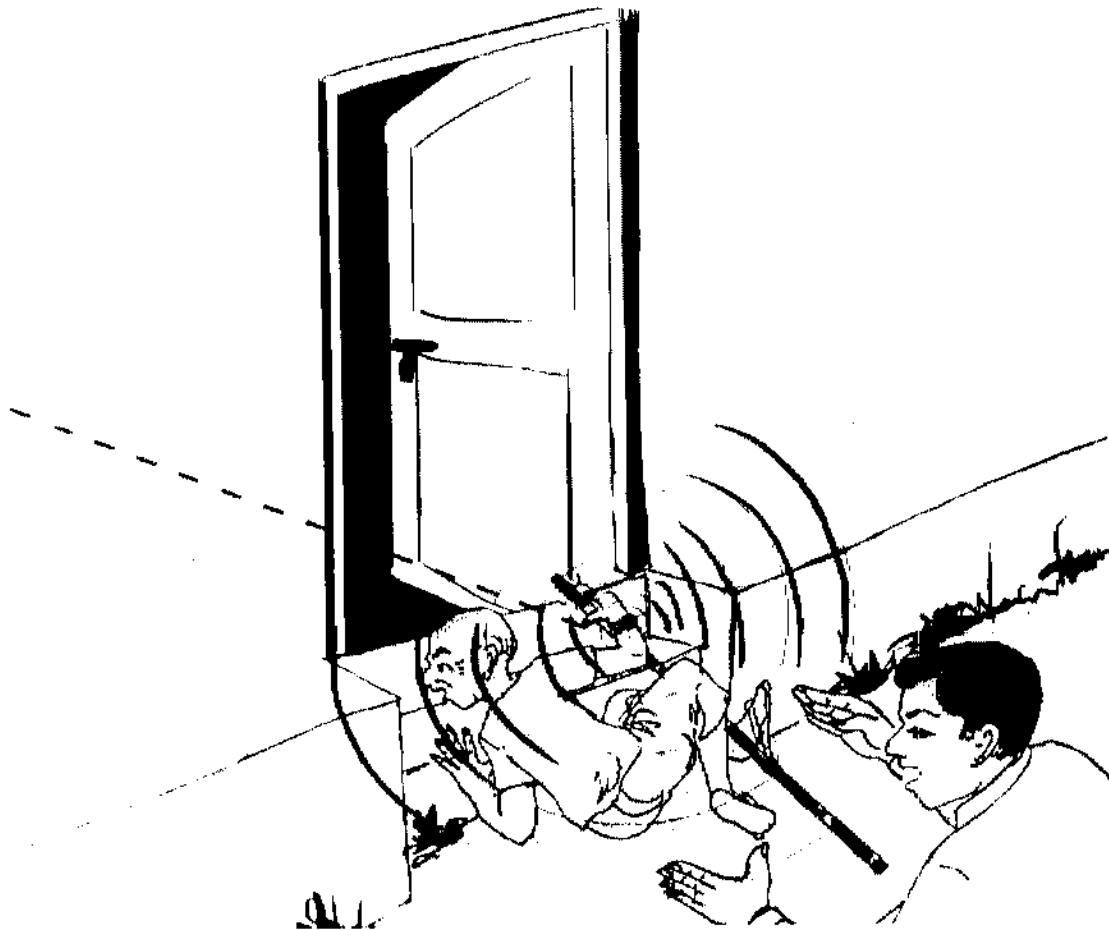
This mechanism designed by *R Santhosh, class 11, J Rajasekar, class 10, A Nivashini, class 10, K Rathna, class 10, Government Girls Higher Secondary School, Tiruvarur, Tamil Nadu* would not allow the bus to move if people are standing on its stairs, thereby preventing accidents. This was a common problem in India. Santhosh thought about this idea while commuting from his village to his school.

f. Reminding the owner if keys are forgotten in the vehicle



A system in vehicle, which intimates the driver through a phone call if the keys have been forgotten in the vehicle; also prevents theft. This was developed by *Chandramouly K Kandachar, class 12, RV PU College, Bangalore, Karnataka*. Chandramouly's sister often forgot the keys in the car. He read about incidents where owner by mistake left the keys in the car, which got stolen subsequently; hence this idea.

- g. Device to indicate sudden fall or onset of convulsions /seizure..



This is a wearable device that alerts if user falls suddenly; useful for old people, and those suffering from fits, convulsions, seizures etc. This will help keep an electronic eye (if integrated with mobile) on one's loved ones to track if they were okay or not. The idea struck Soumya Ranjan, *Behera, 7, BTTS Upper Primary School, Jagatisinghpur, Odisha* when one of his friends with epileptic attack fell down.

The above examples citing innovations developed through research by students in India is one of the reasons why students should do research. Several other examples of research based innovations abound from other climes
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<https://www.youtube.com/watch?v=vRVFFNF8rUc>

b. Some Innovations by FUTO Students

It is notable that our students in FUTO have taken part in a number of innovative projects. For example, **FUTO Formula 1**, the first made in Nigeria sports car was produced from locally sourced materials by the Groups A and B Class of 2007/2008 graduating students of Mechanical Engineering under the close supervision of Professor O.M.I. Nwafor (then Head of Department), Engr. S.U. Ehujuo (Chief Technologist) and Engr. Johnson Igbokwe and Engr. G.O. Onuoha (then Senior Lecturers) all of the Department of Mechanical Engineering, FUTO.

Similarly, **FUTO "Africar" (ACar) project** is an international collaboration with the Technical University, Munich where our students from the Department of Mechanical Engineering are playing pivotal roles in the project. The **ACar** when completed will be affordable, adaptable to the environment and will compete favourably with existing cars. The prototype was unveiled at the Technical University Munich on May 22, 2014.

Furthermore, staff and students of the Department of Agricultural Engineering built a **kerosene-powered dryer** for speedy extraction of moisture from detoxified cassava for livestock feed and for export. The locally fabricated dryer can process 200kg of wet cassava in 12 hours on 8 litres of kerosene.

Besides creating innovations, there are numerous other benefits for undergraduate and postgraduate students who get involved in research.

Firstly, research experiences give students an opportunity to gain deeper knowledge of research techniques and processes, apply classroom learning into real practical contexts, explore academic literature, and form meaningful relationships with Faculty members and professional researchers.

Secondly, research experience can impact the future career choices of students. Through exposure to research, many students can discover their passion for research in an area of interest and enroll for graduate studies and may gain Faculty positions in the future. In this instance therefore, the earlier students become involved, the more experience they may gain which becomes vital for a successful career in an area of interest.

Thirdly, through direct involvement in research, students find it easier to understand the rationale underlying other people's studies and the implications of their results as it affects development. For example, only after forming one's own hypotheses does one truly understand the differences and difficulties associated with research designs and better conceptualize research as an activity.

Fourthly, undergraduate research can provide students with an ongoing source of one-on-one mentorship that is alien to undergraduate curriculum but very fundamental for success in life.

Fifthly, a less direct benefit, and one that is more difficult to teach in the classroom, is the balance between independence and collaboration. Research is often performed in teams, and one must learn to balance a collaborative effort in the laboratory with what one is capable of accomplishing independently. Interdisciplinary work is difficult to teach in the classroom, and on-hands experience with teams is a bonus for any workplace environment. The nature of research today is such that interdisciplinary teams are becoming the norm, and gaining firsthand experience in teamwork should be promoted through students' research.

Sixthly, exposure to research as students can also increase the likelihood of becoming successful researchers in the future. Some undergraduates, unsure of what to do upon degree completion, proceed to graduate school with the ill-gotten idea that it is the next logical step after undergraduate studies. If they had undergraduate experience in research, they are more likely to know if they actually enjoyed research. Usually, however, undergraduate students discover a passion for research they did not know existed. Therefore in sustaining students' research interest, institutions of higher education must have a way of attracting the most curious minds. Asking questions and finding answers is a calling that many students discover only after they first tested the research waters.

Seventhly and very importantly, exposure to research as students can increase the likelihood of becoming successful entrepreneurs of the future. The ability to start businesses, grow them and create jobs on graduation is the fundamental recipe for success in today's world especially in the face of lots of uncertainties. The members of the student elite club, **Enactus (formerly Students' in Free Enterprise [SIFE])** are eloquent examples of those, whose exposure to research prepared them adequately to become successful

entrepreneurs. Professor O.T. Ebiringa, the Faculty Advisor of FUTO Enactus can bear testimony to this assertion. Research therefore, should be at the core and must be instrumental in generating a major interface with the academic and business world.

Eighthly, research allows students to develop professionally and personally in ways not possible through traditional lecture and laboratory courses and research has the potential to enhance the consultancy capabilities of the researcher.

4.0 Attributes to Become a Successful Researcher.

Some attributes are necessary in the quest to become a successful researcher.

a. The Pursuit of Excellence

Excellence simply means possessing good qualities. Excellence as a synonym is defined by the following: superiority, pre-eminence, perfection, worth, goodness, purity, greatness. Many scholars will describe excellence as: going far beyond the call of duty and going the extra mile, doing more than others expect, ensuring best practices and highest standards, taking note of the smallest details, putting your best in everything you do etc. Excellence therefore is an important attribute in one becoming a successful research.

b. The Need for Teamwork

In any research activity, team work is important for the achievement of the set objectives. Team effort is an efficient and effective of managing tasks or projects. According to the Vice-Chancellor, Professor F.C. Eze, a team is a group of willing and trained individuals who share common goals; are dependent on one another to achieve their goals; structured to work together; share responsibility for their goals and empowered to implement decisions. And Rory Burke simply defines a team as "a number of people who work closely together to achieve shared common goals and through interaction they strive to enhance their creativity, innovation, problem-solving, decision-making, moral and job performance".

The word team can be aptly described as:

T	-	Together
E	-	Everyone
A	-	Achieves
M	-	More

It is important that you know your role(s) in the research team and play/adhere to it very passionately and effectively. Always walk your talk in team efforts.

c. The Place of Leadership

Leadership as described by Myles Monroe is the capacity to influence, inspire, rally, direct, encourage, motivate, induce, move, mobilize, and activate others to pursue a common goal or purpose while maintaining commitment, momentum, confidence and courage. Indeed leaders are those looked upon by others to show the way. Leadership generally is all about excellence. A School of Thought sees leadership as the ability to do or say or manage things in a way that no one else can, or has done or said or managed. Leaders have the ability to employ better ways to achieve anything. They do ordinary things in extraordinary ways to achieve results. It is notable that good leadership is characterized by qualities such as vision, mission, passion, confidence, determination, persistence, image building, role modeling and external representation. Since leadership roles characterize research efforts, you should demonstrate quality leadership if you become a research team leader.

d. The Role of Mentorship

Mentorship is about teaching and counseling. Mentorship plays a significant role in research both for the mentor and the mentee. Success in any human endeavour including becoming a successful researcher is significantly associated with mentorship. The duty of the mentor is to ensure that you avoid all the "booby traps" on the way or road and guide you safely and quickly to your research destination. However, it is very disturbing that mentorship activities appear to be on a rapid decline in our society. And the big question is, who to blame; the mentor or mentee? I need not gainsay the fact that for you to be a successful, productive and result-oriented researcher, you must be either a mentor or a mentee. Either way, the benefits are numerous.

f. Strict Adherence to Research Ethics and Preserving Sanctity of Research Findings

Ethics are the morals of any industry – the rights and wrongs, the good and bad. It refers to the standards that govern the conduct of a person, especially a member of a profession or a research team. Often times, research ethics are contained in a Policy document. Every institution including FUTO has policies governing the conduct of research. It is important to recognize and respect research ethics of any institution as articulated in their policies. Most importantly, every researcher must respect the sanctity of his or her research findings and refrain from copying other people's work which is, "plagiarism" or academic fraud, a gross misconduct in the academic community.

5.0 Productive Research and Successful Career - Other Matters Arising

In addition to the issues discussed above, a lot more are needed in life's journey towards engaging in productive research aimed at attaining a successful career. Templar in the Rules of Work summarized a few of these issues as shown below:

a. You must enjoy your career.

Just as the saying that "**there is no shame in tears**", there is no shame in admitting that you enjoy your career. Do not be afraid of being labeled a workaholic because you enjoy working or performing your experiments. According to Templar, once you acknowledge that work is fun – and for you, it is even more fun than anyone else – you will find your steps lighten, your stress levels decrease and your whole demeanour lightens. By admitting that work is fun, you are trading in a secret bit of knowledge that only really successful people usually have. Work is fun – engrave it on your heart.

b. Always develop the right attitude

It is always important to develop the right attitude to work (including research) and to general issues in life. The right attitude means giving it your best shot every single day and in all instances and in all situations. The right attitude means going the extra mile, making extra effort even when the enabling environment is unfriendly.

c. Show hundred percent (100%) commitment

Showing a 100% commitment in your research or at work means working harder than others, not losing sight of your long-term goals, making no slips, no mistakes etc. President Obama would always say, "***Do not take your eye off the ball***". And Templar likened this situation to master criminals who lead incredibly law abiding lives because they can't risk breaking a tiny law in case it draws attention to them and the really big crimes get revealed.

d. Learn from others mistakes

Learning from others' mistakes makes you a **wise man** as against learning from your mistake which simply makes you a **clever man**. We cannot gainsay the fact that the fewer mistakes you make, the more likely you will become a successful researcher and earn the admiration of colleagues.

e. Act one step ahead

A careful observation of your superiors (or mentors as the case may be) in the office or in the research team etc can show what they do differently from the other members of the team or colleagues in the office as the case may be. This helps put you one step ahead of your contemporaries or juniors.

f. Think one step ahead

Thinking one step up is about thinking expediently. It is likened to thinking like a boss or leader and less as a worker or follower. This broadens your perspective to see the big picture, see the entire picture, picture the picture rather than your own personal life.

g. Never pay "eye service" or "lip service" to any productive activity

Always do your work and your bit in any endeavour. Walk the work. The only one who rewards your labour is God and no one else.

h. Pray always

The import of daily prayer in life's journey and achievement of successful careers including productive research cannot be over-emphasized. My father always told me that two basic rules are the recipe for success in life endeavours namely: *"Pray hard as if it depends on God"; "Work hard as if it depends on you"*.

6.0 Conclusion

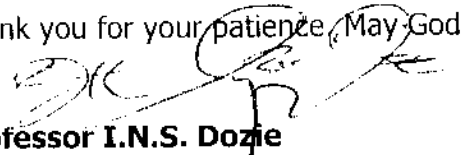
Research is an important aspect of education that should thread its way through students' experiences from first year to graduation and through postgraduate studies. Research assists students to develop skills they will use throughout their lives and in the eventual choice of future careers. Involvement in research sharpens students' leadership and teamwork skills as well as the ability to collaborate with others. Participating in research also teaches students how to effectively communicate their ideas and how to analyze and critique the work of others. While classroom learning is an important aspect of education, it is essential too to entrench and/or sustain an academic culture where students have the ability to participate in a hands-on fashion. This helps in the attainment of complete education for students and preparation for future life endeavours including becoming successful scientists, innovators, entrepreneurs, policy makers etc. Students, therefore, must do research.

Additional efforts should be made by authorities to continue to improve the learning environment and infrastructure necessary for research such as provision of quality and steady electricity, recruitment of additional qualified laboratory staff, equipment of laboratories with modern facilities, review of teaching curricula with infusion of relevant laboratory/practical courses, setting up of laboratories to stimulate interest in new areas of endeavour such as a central laboratory for basic molecular studies etc.

The sustenance of Students and Innovation Expo or Fairs such as FUTO STRIVE with adequate reward systems will continue to engender students' interest in research. In addition, institution of annual awards at Departmental, Faculty and University levels may help stimulate students' drive and interest in research.

In summation, the Nigerian economy is in deep recession. There are lots and lots of clamour for diversification of the economy as a way of solving our economic problems. Areas of interest in this diversification mission include agriculture, energy, solid minerals, transportation, ICT, health etc etc. Success in solving our economic problems lies on research and innovations. The establishment of medium and small scale industries that will create jobs and revive the economy depend on research and innovations. This was the success story of the Asian Tigers. This is the success story of Israel and many other developing economies of the world, Malaysia, Singapore, Hong Kong, South Africa, Egypt etc. The Indian students have demonstrated the possibility of innovations as articulated above. This can be our success story too. This is part of the reason for the institution of FUTO STRIVE by the current administration, not only to engender a culture of excellence but drive innovations for the task of self actualization and for revival of an ailing economy. I challenge you all present and your friends to be part of this effort by adjusting your thinking cap. Nigerians are ingenious by nature. I am optimistic that if we continue to push and pray, something positive will happen.

Thank you for your patience. May God Bless Us All.



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