

Redefining the Education Ecosystem in the Face of the Fourth Industrial Revolution–To Be or Not to Be?

M. U. Adikwu

**University of Abuja, PMB 117, FCT, Abuja
Paper Presented at the 5th Edition of the Digital
Africa Conference and Exhibition,
Abuja, 6th –8th June, 2017.**

Introduction

- ❖ What is the Fourth Industrial Revolution?
 - The Fourth Industrial Revolution, or 4IR, is the fourth major industrial era since the initial Industrial Revolution of the 18th century.
 - The Fourth Industrial Revolution can be described as a range of new technologies that are fusing the physical, digital and biological worlds, and impacting all disciplines, economies and industries.
 - Education is the only way to bridge the gap that exists between the Advanced Nations and the Developing Nations in terms revolutionary gaps.

Introduction Contd.

- ❑ Many people think that the life of a nation depends on the raw materials it possesses.
- ❑ That is not true as can be seen from the case of Africa.
- ❑ I heard from the grapevine that Africa has over 68 percent of the world's resources.
- ❑ Yet Africa is the poorest continent.
- ❑ The quality of every nation is dependent on the quality of its citizens.
- ❑ And the quality of a nation's citizens depend largely on the quality of its education.
- ❑ Education is a catalyst for development

Introduction contd.

- ❖ Nigeria's education system has not changed radically as it should be
- The educational environment has become very complex and dynamic
- Yet our educational system is still traditional.
- In the traditional education system, people were trained to be office clerks and interpreters to native authorities and in the churches.
- A consultant informed us that WAEC examination questions of 1927 and 1960 were repeated in 2010!

Problems with our Educational System

❑ *Knowledge Generation*

- ▶ For every academic, the number one problem is knowledge generation.
- ▶ Our curriculum at all levels is bloated with alien and western ideas that are based largely on western culture and environment.
- ▶ If our curriculum from the time of independence till date focussed on petroleum and its products, palm oil and its applications, groundnut, etc, Nigeria would not be talking about recession today.
- ▶ Many Latin American countries such as Brazil designed their curricula on the Amazonia (the Amazon forest and its products) and today, they have graduated from what used to be called Third World countries.

The Way Forward

❖ *Creativity and Originality*

“It is what we think we know already that often prevents us from learning.” *Claude Bernard.*

- ❖ Creativity is in the thinking while innovation is in practically achieving what has been thought about.
- ❖ Creativity and originality are easier when there is inspiration which comes from either God or other spiritual sources.
- ❖ In the days of Erasmus, Martin Luther, Leonardo da Vinci, George Frederic Handel, etc, the Western Intellectual Tradition was developed.
- ❖ The argument of the era was whether revelation was superior to reasoning or reasoning was superior to revelation.

The Role of Postdoctoral Fellowships in Knowledge Transfer

- ❖ Postdoctoral Fellowships are like interns but usually research is involved.
- ❖ When the fellowship is after one's PhD, it is termed postdoctoral fellowship.
- ❖ It is what the West uses to enhance knowledge.
- ❖ The United States has its Fulbright Fellowship and a host of inter-university fellowships
- ❖ The United Kingdom has its Royal Society Fellowship
- ❖ Japan has its Japan Society for the Promotion of Science Fellowship, Matsumae Fellowship, etc.
- ❖ South African and India have their Centre for Scientific Research Fellowships.

Postdoctoral Fellowships Contd.

❖ *Knowledge Inflow*

- ▶ Having original ideas is always not easy among many academics even in advanced countries.
- ▶ This has lead to academic fraud whereby people copy PhD thesis with generational gaps or one carried out in a different institution.
- ▶ In many Nigerian institutions many higher degree students wait for a year or more for their supervisors to assign topics to them.
- ▶ Some become frustrated and abandon their studies denying the academic system of very brilliant minds.

Postdoctoral Fellowships -Knowledge Inflow Contd.

- ▶ Most people supervising postdoctoral fellowships in other lands receive thousands of research proposals from all over the world every year and may accept none, or just one or two candidates depending on availability of space.
- ▶ Such research proposals become a library of knowledge that are readily assigned to higher degree students from the local environment.

Postdoctoral Fellowships Contd.

❖ Solution to National Problems

- ▶ Many postdoctoral fellowship programs have both junior and senior arms for fresh PhD graduates and experienced researchers respectively.
- ▶ Senior research fellowships are targeted at solving very difficult national problems such as the power problem in Nigeria.
- ▶ Such experienced fellows are gotten and given fairly large sums of money and they in turn can hire junior fellows.
- ▶ They are given some period of two to five years in the host country and by the time they leave the problem is either completely solved or a clear road map on how to solve the problem is presented.

Postdoctoral Fellowships Contd.

❖ Building of Local Capacity

- ▶ There are lots of pieces of equipment scattered all over the country that no one or just a few have capacity to use.
- ▶ In many advanced countries certain pieces of equipment are only bought on demand by postdoctoral fellows.
- ▶ While they are using them, they simultaneously train local researchers on how to use them.
- ▶ By the time they leave the country, local capacity is already built on how to use these pieces of equipment.

Postdoctoral Fellowships Contd.

❖ Identification of Local Problems and Roadmap Development

- ▶ Some post-doctoral fellowships at the senior level may be just to identify key national problems and to define roadmaps for them.
- ▶ They could help also to make curriculum suitable for addressing such national problems through research.
- ▶ For instance, many nations build their curriculum on what they have comparative advantage in or what is abundant in their environment.

Postdoctoral Fellowships Contd.

❖ Internationalization of the Educational System

- ▶ The Nigerian education and research environment is too homogeneous and albeit local.
- ▶ This is a far cry from what happens elsewhere.
- ▶ Postdoctoral systems bring in highly talented individuals from various parts of the world.
- ▶ Many of them, if given favourable condition may continue to stay and be integrated into the Nigerian academic system.

Postdoctoral Fellowships Contd.

❖ *Economic gains*

- ▶ Many postdoctoral fellows end up making discoveries and inventions all of which belong to the host institution and as such to the host country.
- ▶ This brings in much economic gains to the country which many continue for decades, if not centuries, in terms of finance as well as job creation.

Postdoctoral Fellowships Contd.

❖ *Building a Culture of Research*

- ▶ There is a common saying that the easiest way to feed to satisfaction when one has lost appetite is to eat with others.
- ▶ The culture of research that is being gradually lost in Nigerian institutions can be regained through the introduction of the postdoctoral system.
- ▶ Many Nigerians go for study that involves research nowadays because they have no job.
- ▶ Most others do research studies on part time basis.
- ▶ When they see people from other lands who do nothing else apart from research, they too will be encouraged to take up research.

Postdoctoral Fellowships Contd.

- ❖ ***Production of High Level Manpower for the System***
- ▶ Most trainings that are geared towards building high level manpower are usually *ad hoc in* nature.
- ▶ What this means is that the people are not adequately trained or when they return home from foreign institutions do not meet proper working environment.
- ▶ It is often a common phenomenon that an American and Japanese share a Nobel Prize for work done in different laboratories.
- ▶ This is because they have been to each other's labs and when they return, the research environment is not very different.

Postdoctoral Fellowships Contd.

❖ *Scholarly Exchange of Staff*

- ▶ Most postdoctoral students, on completion, will normally invite their hosts to their institutions back home even for a short period of stay.
- ▶ These exchanges can lead to collaborations that can bring further internationalization of the local institutions.
- ❖ At the University of Abuja some interns will be coming from China to learn African drumming
- ❖ We are also working out a system to enlist postdoctoral fellows from overseas into our University.

Mentoring

- ❖ Mentor was the name of the teacher of the son of the Greek king in Odysseus.
- ❖ In Greek mythology, Mentor was the son of Heracles and Asopis
- ❖ Mentor was a friend of Odysseus who placed Mentor and Odysseus' foster-brother Eumaeus in charge of his son Telemachus, and at Odysseus' palace, when Odysseus left for the Trojan War.
- ❖ A mentor is quite necessary to help the younger ones in the following areas:
 - **Knowledge generation**

Mentoring Contd.

- Many mentorees will generate new knowledge from the research area of the mentor.
- ▶ **Creativity**
- Many mentors can help mentorees to be creative in their thinking
- ▶ **Dynamic and complex system of research**
- Many mentors can help mentorees to fit into the current dynamic and complex system of research.
- ▶ Many of the experienced researchers die without passing their knowledge to future generations.
- ▶ This will not happen if there are mentorees.

Leadership in Our Educational Institutions

- ❖ In Nigeria, the leadership of our educational institutions is based largely on ethnicity.
- ▶ The headship of a university, polytechnic, monotechnic or college of education must be occupied by someone from the immediate environment of the institution independent of whether he has the capacity to lead or not.
- ▶ That is because leadership is tied to what an individual will get and not what he will contribute.
- ▶ That portends a lot of danger to our educational ecosystem.

Promotions

- ▶ Closely related to the issue of leadership is the issue of promotions.
- ▶ “Village” vice chancellors or rectors, or provosts will usually concentrate on promoting people from the local environment of the institutions independent of quality.
- ▶ Others from other places are made to either be frustrated or wait for longer than necessary.
- ▶ There is no serious parameter in ensuring that only high quality persons with evidence of track records are promoted.
- ▶ There is no uniformity in terms of the “yellow” book (promotion guidelines) that can be applied nationally.

Homogeneity of our Educational Ecosystem

- ▶ Our educational system is too homogenous in terms of students and staffing.
- ▶ I was told that in one Ghanaian University there were over five thousand (5,000) American students.
- ▶ There is no culture that has the prerogative of hatching knowledge.
- ▶ Knowledge is best if it is hatched and incubated upon by people from different cultures.

Homogeneity of our Educational Ecosystem

Contd.

- ▶ In the 1960s and 1970s up to the 80s, our educational standard was equal to anywhere in the world because we had various lecturers from different parts of the world.
- ▶ Many Nigerians who went overseas never did a masters before their PhD
- ▶ I know two people who had certificate in textile technology in the 70s.
- ▶ Certificate in textile technology is less than OND.
- ▶ They went to the United Kingdom and did a postgraduate diploma, followed by a PhD!

Lack of Interest in Local Research by Certain Classes of People

- ❖ In Nigerian there are lots of inventions and discoveries by people who may not be well-lettered.
- ❖ As the National Coordinator of a World Bank-assisted Science and Technology Education Project I met a lot of these people.
 - ▶ A boy made a fan that had two faces and could fan in all directions at the same time.
 - ▶ Another one made a model aeroplane that could fly very clearly.
 - ▶ Another man said he could generate electricity without following the principle of the conservation of energy.
 - ▶ Many showed that they could cure various diseases such as cancer, diabetes, hypertension, etc.

Lack of Interest in Local Research by Certain Classes of People Contd.

- ▶ Some of these people were illiterates.
- ▶ Others were just secondary schools leavers.
- ▶ Some devolved into fields that were not their areas of specialisation.
- ▶ To be able to harness the benefits of such inventions or discoveries, Government should set a unit or department in the Ministry of Education or Ministry Science and Technology for this purpose.

The Role of Lecturers

- ❖ Well trained and exposed lecturers are needed to bring in the changes that the nation needs to fit well into the Fourth Industrial Revolution.
- ❖ Universities are the main contributors to national economies in other climes.
- ❖ In many schools in Nigeria, people do not finish their PhD and master's degrees in less than 5 years.
- ❖ There is both a waste of time and resources.
- ❖ This is seriously affecting those national bodies who may want to sponsor candidates for a stipulated period of time.
- ❖ Our educational system needs complete overhauling!

Conclusion

- ▶ For Nigeria to benefit in this era of the 4IR, the educational ecosystem needs a radical change.
- ▶ There must be “modern” teachers to teach the new ways in the physical, digital and biological worlds, to impact all disciplines, economies and industries.
- ▶ There must be new ways to enhance knowledge inflow through postdoctoral fellowship.
- ▶ Our reward systems through promotions must be strengthened and made uniform.
- ▶ There must be good mentoring systems.
- ▶ Local inventions and discoveries must be streamlined through deliberate efforts.

Conclusion

▶ **Thank you.**

