

**ISLAM, MUSLIMS, SCIENCE AND
TECHNOLOGY DEVELOPMENT IN NIGERIA:
A CRITICAL APPRAISAL**

BY

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TEXT OF THE LECTURE PRESENTED AS LEAD SPEAKER AT THE 3RD INTERNATIONAL CONFERENCE ON ISLAM ORGANISED BY ISLAMIC WELFARE FOUNDATION WITH THE THEME “THE MUSLIM AGENDA FOR NIGERIA: CHALLENGES OF DEVELOPMENT AND GOOD GOVERNANCE” HELD ON 22ND TO 25TH NOVEMBER, 2015 AT NASFAT ETI-OSA AUDITORIUM, FOUNTAIN UNIVERSITY, OSOGBO.

PREAMBLE

1. I feel greatly delighted to be considered worthy as one of the Lead Speakers at the 3rd International Conference on Islam organised by Islamic welfare Foundation (IWF) with the theme “ The Muslim Agenda for Nigeria: Challenges of Development and Good Governance”
2. Kindly permit me to observe the appropriateness of the theme and to congratulate the entire membership of IWF in its efforts in the pursuance of its mandate. I note with happiness the application of intellectual approach to the propagation of Islam as opposed to emotional reactions on issues as entrenched in your philosophy. This is worthy of commendation.
3. As one of the Lead Speakers, I am to address the sub-theme “Islam, Muslims and Development of Science and Technology in Nigeria” The sub-theme neatly appropriates into the theme being a relevant issue on development and an important index of good governance.
4. Consequently, in addressing the sub-theme, I intend to address the issue as underlisted with the hope that I would succeed in laying the foundation for possible subsequent contributions by other speakers:

(i) Introduction

(ii) Islam, Science and Technology

(iii) Development of Science and Technology in Nigeria

(iv) Impediment and Solution for Development of Science and Technology in Nigeria

(v) The Way Forward

(vi) Conclusion

(vii) Recommendation

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OUTLINE:

- 1. Introduction**
- 2. Islam, Science and Technology**
 - 2.1 Evidences from the Qur'an**
 - 2.1 Evidences from the Earlier Muslims**
 - 2.2 Evidences as reflected by the establishment of Islamic Institutions**
 - 2.4 Evidences as acknowledged by Non-Muslims**
- 3 Development of Science and Technology in Nigeria**
 - 3.1 Pre-colonial Era**
 - 3.2 Colonial and Post-colonial Era**
 - 3.3 Post-Independence Era**
 - 3.4 Contributions of Nigerian Muslims**
- 4 Impediments and Solution**
- 5 The Way Forward**
- 6 Conclusion**

1. INTRODUCTION

Islam is an Arabic word derived from the verb “Salima” which means to Submit. Thus, Islam can be defined as the total submission to the will of Almighty Allah (Subhanahu Wa Ta’alaa), the Creator, Fashioner and Sustainer of the entire universe. Allah says in the holy Qur’an:

“Surely, the acceptable religion in the sight of Allah is Islam”.(Q3:19)

It is instructive to state that Islam as a religion is not restricted only to our noble Prophet Muhammad (Sallaalahu Alayhi WaSalam), it is the religion of the past Prophets, and that of anyone who submits to Almighty Allah alone. The religion of Islam is characterized by the five pillars;*At-tashadud* (the pronouncement of “Laa ilaha illallahu, Muhammada rosullullahi”), *Iqqaamati solaat* (establishing solaat) *Ittahu zakat* (payment of zakat), *As sawmu ramadan* (fasting in Ramadan), *Hijju-l-bayt* (observing Hajj).The religion was perfected by Allah for and through His last messenger, Prophet Muhammad as espoused in Qur’an:

“This day, I have perfected your religion for you, completed my favour upon you, and I have chosen for you Islam as your religion”(Q5:3)

This shows that Islam is all encompassing, and touches on every aspect of human endeavour. The Qur’an, a divine book of Islam, is an encyclopedia that gives information on many subjects including science and technology. It is an embodiment of diverse nature of the world and a comprehensive tool for development. Upholding the Qur’an in its entirety, in accordance with the teachings of the Noble Prophet was what made it possible for earlier Muslims (our predecessors) to contribute immensely to humanity which today serve as the basis for the development of science and technology.

In general, those that practice Islam are called Muslims

“It is He (Allaah) who has named you Muslims before and in this (the Qur’an)...” (Q22:78)

Muslims by virtue of their faith place high premium on educational and intellectual developments. Education, the motherboard of science and technology took its pace from Islam. Islam is known to have its base root on knowledge as exemplified by the first revelation to Prophet Muhammad in Qur’an (Q96:1-5). The verses emphasize the importance of knowledge and seeking for it. Considering the present state, Muslim educationists and intellectuals in the world including those in Nigeria have been emphasizing on and should continue to encourage the importance of educational reforms towards the development of science and technology. Increasing the priority for scientific and technological development is partly the answer to good governance in tune with the theme of the conference.

2. Islam, Science and Technology

As indicated earlier, Islam is a religion that touches on all aspects of human endeavours including the basis for science and technology as detailed in the Qur’an. The very first revelation of Allah to Prophet Muhammad was an injunction to acquire knowledge.

“Read in the name of your Lord the Most High” (Q96:1)

A scientific inquest needs further research, reflection and actions; this guidance from the Qur’an by Allaah finely correlates with the objective of science and technology. Science begins with critical thinking or reflection on a problem and proposing a solution to the problem; followed by

a systematic approach to establishing facts regarding the proposed solution to the problem. Science therefore is based on **knowledge**, its bedrock being **education**. Thus,

“Read in the name of your Lord the Most High” (Q96:1)

The astrophysicist, **Nidhal Guessoum** while being highly critical of “pseudo-scientific” claims made about the Qur’an highlighted the encouragement for sciences that the Quran provides by developing the **concept of knowledge**. He writes: **“The Qur'an draws attention to the danger of conjecturing without evidence...**

And follow not that of which you have not the (certain) knowledge of... (Q17:36).

From this verse, it is clear that Islam emphasises on the need for knowledge in whatever we do, and to always have evidences for our actions. This **“concept of knowledge” and “evidence”** is a major nexus between **Islam, Science and Technology**.

Likewise in several verses of the holy Qur’an, Allah asks Muslims to always inquire for proofs, Allaah said:

Say: Bring your proof if you are truthful(Q2:111)

This guidance applies not only to matters of theological belief but also to natural science. There are about 750 verses in the Quran dealing with **natural phenomenon**. In many of these verses the study of nature is *“encouraged and highly recommended”*. The Noble Quran states:

“We (Allah) will show you (mankind) Our signs/patterns in the horizons/universe and in yourselves until you are convinced that the revelation is the truth.”(Q41:53).

It is important to state that the Quran is a book of signs and Science and Technology is just part of it. The signs are there for people to recognize existence of Allaah and affirmed his revelation. Unlike Science, where an accepted theory or fact may be disproved or turn out to be false after re-investigation.

2.1 Evidences from the Qur'an

Scientific observation, experimental knowledge and rationality are the primary tools by which Muslims and the whole humanity in general can achieve the goals laid out for it in the Quran.

Some of these evidences which have been discussed in the Quran are:

(a) Biology - Origin of Life:

Allaah says in the Qur'an:

We made everything from water, will they not believe?"(Q21:30)

Water is very essential for all living things, we all know that water is vital to life but the Quran makes a very unusual claim. In this verse, water is pointed out as the origin of life; all living things are made of cells. Scientific research has shown that cells are mostly made up of water; 80 % of the cytoplasm (basic cell material) of a standard animal cell is made up of water. This fact was discovered only after the invention of microscope.

(b) Astronomy – Time

The moon and the sun are very vital in the life of a Muslim, as it is used to determine the beginning and the end of the months, and also confirmation of the times of the daily prayers. The Quran contains many references to astronomy, an example is

Allah says:

And it is He who created the night and the day and the sun and the moon; each flowing in its orbit(Q21:33).

The initial theory by Scientists for over 200 years was that the sun is motionless at the centre of the solar system and that the planets revolve around it. It is now an established fact that the sun is not stationary but is moving in an orbit. A scientific fact laid out in the Qur'an before the advent of modern science. This affirms that the Qur'an is a book of signs and not just science which is subject to change.

(c) Climate - Protection and Change

We made the sky a protective ceiling. And yet they are turning away from our sign! (Q21:32)

The sky plays a crucial role in protecting the earth from the lethal rays (radiation) of the Sun. Without the sky, life would be impossible under direct Sun radiation. The sky also acts like a blanket wrapped around the earth to protect us from the freezing conditions of the outer space (~ -270 °C).

The depletion of the ozone layer by indiscriminate activities of man, has led to greenhouse effect – global warming and climate change – this adverse effect of this deviation from the guidance of Allah is apparent for all to see.

(d) Geography – Mountains and Universe

Did we not make the Earth a resting place (for you)? And the mountains (its) pegs? (Q78: 6-7)

This verse shows that the mountains have deep roots by using the word *pegs*. The Mount Everest (One of the highest peak on Earth) is approximately 9 km above ground has its roots as deep as 125 km.

And it is we, who have built the Universe and with (our creative) power and keep expanding it.(Q51:47)

The fact that universe is expanding was recently established in the last century by scientists and the discoveries of new planets, stars and heavenly bodies attest to the veracity of the above verse.

2.2 Evidences from Contributions of the Earlier Muslims

Verses from the Qur'an, and the injunctions to learn, inspired the earlier Muslim scholars to study natural phenomenon. They integrated the earlier works of the Indians, Persians and Greeks into a new synthesis which led into some new scientific discoveries. For examples;

(a) Geography

The Quran encourages people to travel throughout the earth to see God's signs and patterns. Islam requires each Muslim to have at least enough knowledge of geography to know the direction of the Qiblah (the position of the Ka'bah in Makkah) in order to pray five times a day.

Muslims were also used to taking long journeys to conduct trade as well as to make the Hajj and spread their religion. The far-flung Islamic empire enabled scholar-explorers to compile large amounts of geographical and climatic information from the Atlantic to the Pacific.

Muslim Scientists established in the ninth century that the world was round and under the Caliphate of Mamun, the first map of the globe was made. Among the most famous names in the field of geography, even in the West, are **IbnKhalidun** and **IbnBatuta**, renowned for their written accounts of their extensive explorations. In 1166, **Al-Idrisi**, the well-known Muslim scholar who served the Sicilian court, produced very accurate maps, including a world map with all the continents and their mountains, rivers and famous cities, while **Al-Muqdish** was the first geographer to produce accurate maps in colour.

(b) Mathematics

The first great Muslim Mathematician, **Al-Khawarizmi**, invented the subject of Algebra (al-Jabr). **Thabit Ibn Qurrah**: the first to solve problems with what is now known as Calculus. Muslims also excelled in geometry and the most notable **Al-Biruni** (who

excelled also in the fields of natural History, even Geology and Mineralogy) established Trigonometry as a distinct branch of Mathematics.

The Arabic system, still used today in the West, enabled the West to achieve great breakthrough in Mathematics. Arabic numerals became an intensely workable code, one so simple that literally any child can handle it, so flexible that in the hands of the Mathematicians it became a vocabulary by which the most complex relations between the most astronomical quantities can be expressed.

Arabic numerals were first transmitted and used in the West during the latter half of the twelfth century through the translation of the first part of al-Khawarizmi's "The Book of Addition and Subtraction in Indian Arithmetic" which survives as a translation only. By this time, many other important works in Arabic were well ahead of the West, including the works of **al-Karaji (c.1000)**, **Umar al-Khayyam (d. 1130)**, **as-Samaw'al (d. c. 1175)**, and **Ibn al-Haytham (d. c. 1040)**.

Jabir Ibn Hayyan (Geber): Founded Al – Kimiya (Alchemy) now known as Chemistry.

(C) Medicine

In Islam, the human body is a source of appreciation, as it is created by Almighty Allah (God). How it functions, how to keep it clean and safe, how to prevent diseases from attacking it or cure those diseases, have been important issues for Muslims.

The Prophet Muhammad himself urged people to "take medicines for your diseases", as people at that time were reluctant to do so at that time. He also said,

"God created no illness, except that He has established for it a cure, except for old age. When the antidote is applied, the patient will recover with the permission of God." (Hadith)

IbnSina (d. 1037), better known to the West as Avicenna, was perhaps the greatest physician until the modern era. His famous book, *Al-Qanun fi al-Tibb*, remained a standard textbook even in Europe, for over 700 years. He also made other significant contributions in Pharmacology, such as IbnSina's *Kitab al-Shifa'* (Book of Healing), and in public health.

Ar-Razi (Razes) applied Chemistry and Physics to medicine and wrote medical books. He was a pioneer in Paediatrics, obstetrics, and Ophthalmology; he was also a Surgeon. He explained how to remove cataract and was an expert in the management of diseases. He stressed empirical observation and clinical medicine and was unrivalled as a diagnostician. He also wrote a treatise on hygiene in hospitals.

Sa'ad al – Katib excelled in Gynaecology and **Abul-QasimAz-Zahrawi** was a very famous surgeon in the eleventh century, known in Europe for his work, *Concession* (*Kitab al-Tasrif*).

Every major city in the Islamic world had a number of excellent hospitals, some of them teaching hospitals, and many of them were specialized for particular diseases, including mental and emotional. The **Ottomans** were particularly noted for their building of hospitals and for the high level of Hygiene practiced in them.

(d) Physics and Optics

Kamaluddin examined the refraction of sun light in raindrops and actually explained the genesis of primary and secondary rainbows. The story of the invention of the pendulum

and the presentation of a water clock to Emperor Charlemagne by **Harun Al Rashid** is well known. In the field of optics, Camera Obscura was invented by **Ibn Haitham in 1038 AD.**

(e) Mechanical Engineering.

The development of science of Mechanics in Islam is an act of genius. **Musa Ibn Shakir** described one hundred pieces of mechanical equipment in his book of artifices. Other outstanding Muslim treatises included “Al Kitab Fi Marifat Al Hiya Al Handasiyya” (The Book of the Knowledge of Ingenious Geometrical Contrivances” by **Abdul Fiaz Ibn Al Raz.** He also did work on accurate weighing, determination of specific Gravity.

(f) Advances in the Industry

Spain under the Islamic rule was an industrial centre. It was one of the wealthiest and thickly populated of European countries. Muslims were leading in Weaving Wool, Silk, Home Pottery, Jewellery, Leather and Perfume Industry. In the middle ages, the world trade was commanded by the Muslims and Baghdad, Bokhara and Samarkand remained centers for world fairs until the 16th Century.

(e) Architecture – Spider webs to cool shaded garden and waterfalls

The parable of those who take protectors other than Allah is that of the spider, who builds (to itself) a house; but truly the flimsiest of houses is the spider's house;- if they but knew (Q29:41)

Like every other Islamic discipline, architecture and its development was very much influenced and directed by the Holy Qur'an and its philosophy of life. From the flimsiest web of architectural design exhibited by the inherent technology built by Allah in spiders

to the ultimate expanse of gardens of paradisedescribed in very simple words in Surah Al-Imran,

"But those who fear their Lord, for them are gardens underneath which rivers flow, wherein they are to dwell forever. A gift of welcome from their Lord." (Q 3:198).

The Holy Qur'an presents the ideal architectural style which offers the maximum comforts, joy and beauty to the residents and is in complete equilibrium with the natural environment, making the maximum use of the natural factors with the least possible waste.

The Qur'an further mentions some of the additional facilities of these residential gardens in these words, ***"We shall soon admit (them) to gardens, with rivers flowing beneath, - their eternal home; and We shall admit them to shades, cool and ever deepening."*** (Qur'an 4:57).

This quality of their blissful residence is clearly described in this verse, ***"Reclining therein upon the couches, they will find there neither (heat of) a Sun nor (the Moon's) bitter cold. The shade of the (garden trees) is close upon them and the clustered fruits thereof hang low."*** (Qur'an 76:13-14).

These descriptions of ideal buildings amidst a natural environment stimulated architectural styles in the early Islamic Era and produced architectural wonders such as the Alhambra of Granada, the beautiful and massive mosques of Cordoba and Seville, Medinat al-Zehra near Cordoba, the Dome of the Rock of Jerusalem, the mosques of Istanbul, the IbnTulun Mosque of Cairo and the TajMahal of Agra. Innumerable

mosques, palaces and castles in Spain, North Africa, India, Turkistan, Iran and other Muslim countries bear evidence of the grandeur and majesty of the architectural styles and modes which sprang from the Qur'anic studies.

The massive structural beauty and simplicity of these buildings, especially of mosques remind one of the Majesty and Greatness of The Creator.

(f.) Medicine – Healing properties of honey

Allah the Almighty says;

"Your Lord revealed to the bees: "Build dwellings in the mountains and the trees, and also in the structures which men erect. Then eat from every kind of fruit and travel the paths of your Lord, which have been made easy for you to follow." From inside them comes a drink of varying colours, containing healing for mankind. There is certainly a Sign in that for people who reflect" (16: 68).

Although honey is one of the most important products of the bee, Honey has more than 80 materials of sugar vitamins and 15 materials of sugars, particularly fructose, glucose, minerals, amino acids and about 5% of unclassified materials.

- *“containing healing for mankind”* is an explicit verse indicating that honey is a **treatment** as well as a **nutrient**.

Alleviating inflammation of cornea if used locally on the eye; an antibiotic if used locally in situ of wounds and burns, and it is used for healing of wounds; antioxidant and a treatment for gastric and duodenal ulcers; a treatment for colds, flu and pharyngitis as well as chronic hepatitis

It was narrated by Al Bukhari and Moslem on the authority of Abu Saeed Al Khudari that

A man came to the Prophet Mohammad (PBUH) and said, "My brother has some abdominal trouble." The Prophet said to him "Let him drink honey." The man returned to the prophet and said: "O Messenger of Allah! I let him drink honey, but it caused him more pain." The prophet said to him; "Go and let him drink honey". The man went and let his brother drink honey, then returned back and said; "O Messenger of Allah, it did not cause him except more pains." The Prophet then said, "Allah has said the truth, but your brother's abdomen has told a lie. Let him drink honey." So he made him drink honey and he was cured.

2.3 Evidences as reflected by establishment of Islamic Institution

The strides by Muslims towards the development of science and technology were institutionalized with knowledge transfer to generations via established Schools, Institutes and Universities. The first trio of Universities in the world were established by Muslims and /or Islamic Empires.

(a) University of Al-Karaouine in Fes, Morocco, which originally was a Mosque, was founded in 859 by **Fatima al-Fihri**, a woman. It is considered the oldest continuously-operating degree-awarding university in the world by the **Guinness Book of World Records**.

(b) Al-Azhar University in Egypt, is the world's second oldest surviving degree-awarding institute founded in 970-972. Al-Azhar University concentrates on a religious syllabus, which pays special attention to the Quranic sciences and traditions of the Prophet Muhammad, while also teaching all modern fields of science.

(c) **Nizamiyya**: This series of universities was established in the eleventh century in what is now present-day Iran. The most celebrated of all the Nizamiyya schools is **Al-Nizamiyya of Baghdad**, established in 1065 and remains operational in Isfahan. Other Nizamiyyah schools were located in **Nishapur, Amul, Mosul, Herat, Damascus, and Basra**. The Nizamiyya schools served as a model for various Universities in the region.

This model was then copied by the west, years after the above trio were founded.

University of Bologna in Italy was the first higher-learning institute established in the Western world in 1088. The term, “university,” was coined at its creation and is today, considered a leader in the European university system and the **University of Paris in France** exact founding is unclear; however, teaching from this university existed since 1096. The university was reorganized as 13 autonomous universities in 1970. These were then followed by **University of Oxford in England, University of Montpellier in France, University of Cambridge in the UK, University of Salamanca in Spain, and University of Padua in Italy**.

2.4 Evidences as acknowledged by Non-Muslims

A few Western Scientists, historians and intellectuals acknowledged the contribution of Muslims in various fields of science and their effects on technological advancements and development. Some of the remarks are quoted below;

(a) Historian **Gibbons** wrote in his fifth volume of “Decline and Fall of the Roman Empire” that the science of Chemistry owes its origin and improvements to the Muslims.

(b) **Carra de Vaux** said “Arithmetic and algebra also flourished alongside of astronomy”.

This was the period of the celebrated al-Khwarizmi whose name, corrupted by the Latin

writers of the West, gave us, it so believed, the term Algorism (sometimes written Algorithm).”

(c) **Joseph Hell** “In the domain of Trigonometry, the theory of Sine, Cosine and Tangent is an heirloom of the Arabs. The brilliant epochs of Peurbach, of Regiomontanus, of Copernicus, cannot be recalled without reminding us of the fundamental and preparatory labour of the Arab Mathematician (Al-Battani, 858-929 A.D.).”

(d) **George Sarton** said “It will suffice here to evoke a few glorious names without contemporary equivalents in the West: **Jabir ibn Haiyan, al-Kindi, al-Khwarizmi, al-Fargani, al-Razi, Thabit ibn Qurra, al-Battani, Hunain ibn Ishaq, al-Farabi, Ibrahim ibn Sinan, al-Masudi, al-Tabari, Abul Wafa, ‘Ali ibn Abbas, Abul Qasim, Ibn al-Jazzar, al-Biruni, Ibn Sina, Ibn Yunus, al-Kashi, Ibn al-Haitham, ‘Ali Ibn ‘Isa al-Ghazali, al-zarqab, Omar Khayyam.**

(e) According to **Dallal**, science in medieval Islam was "practiced on a scale unprecedented in earlier human history or even contemporary human history" and **Donald Routledge Hill** expresses the view that Islam was the driving force behind the Muslim achievements.

(f) **Will Durant, Fielding H. Garrison and Bernard Lewis** held that Muslim scientists helped in laying the foundations for an experimental science with their contributions to the scientific method and their empirical, experimental and quantitative approach to scientific inquiry.

3. Development of Science and Technology in Nigeria

Development of man is strongly attached to maximum derivation of benefits from Science and Technology. While Science is a system of acquiring knowledge using

observation and experimental procedures to describe and explain natural phenomena, Technology is the practical application of knowledge which forms the basis for change in human culture and life style.

3.1 Pre-colonial Era

Before the advent of Colonialism and western education in Nigeria, the people of Nigeria's north and south of the River Niger lived their lives and had their own indigenous technology.

- (a) According to **Gilfoy**, 'Archaeological textiles, dating from the eleventh to the fifteenth century, have been found in several locations across the Sahara measuring about 14-25cm wide'. In Pre-Colonial Nigeria, the process of textile weaving, spinning and dyeing, ginning and carding had been a well-established occupation in pre-colonial town of Ilorin (Onimode, 1982).
- (b) The Iron technology of the Nok culture around Jos, Bauchi, Daima, Kano and Zaria is dated to about 500 B.C. Archaeologists have excavated iron spears and axes at Nok and iron smelting furnaces had been discovered in Taruga, and it is believed to have contributed to the development of agriculture in the region.
- (c) Also, in Great Old Oyo Empire before the arrival of white men, specialized iron mining villages were recorded to have contained 100 to 120 people engaged in iron mining, smelting and smiting. These industrial skills are important in the growth of Old Oyo Empire. The existence of iron ore locally meant early possessions of efficient weapon and tools for their craftsmanship in weaving, dyeing and carving of decorative arts.

(d) More stable and enduring towns of pre-colonial Africa developed because of the intense ritual of market activity. Oliver (1976) called these cities pre-industrial cities, which were theatres of competition for the symbols of power and material well being. In a city like Kano, group masons and other specialized trades could be found in the past, basic elements of a real building industry. From the 15th century, the mosque was one of the most prominent buildings in Hausa towns. Houses, boundary walls and roofs in the towns were built of mud. In the villages the roofs were almost always of grass and boundary walls were of matting or corn stalks. The basic house walls were often made of mud. The conclusion can then be drawn that in the Traditional Style the roofs of the houses were constructed of thatch, but quite early in the development of Northern Nigerian towns the thatched roof was replaced by the flat or dome-shaped mud roof.

These are pointers to the fact that traditionally, local science and technology in Nigeria existed long before what is today regarded as Science and technology, and Muslims in those days contributed to the ways of lives then.

3.1 Colonial and Post Colonial era

3.2.1 Colonial Era

(a) Various regions of Nigeria had at one time developed technologies that are suitable for their industrial development before colonialism, a development that was brought to an abrupt end as a result of her contact with the Europeans and the introduction of slave trade and at a later date, lucrative trade in African goods.

(b) Although there were increase in foreign trade of agricultural products like palm oil, ivory, gums and pepper, cocoa, coffee, groundnut and rubber. These developments, however, hindered the modernization of the indigenous technology in iron and crafts in the sub-region as a whole and Nigeria in particular, because rather than improve on the local skills of production, they were replaced or lost.

(c) The introduction of colonial rule and by extension ‘imperialism’ was fortuitous, transferring to the metropolitan states the wealth of the underdeveloped nations, there- by undermining them through capital and human exploitation, colonialism and contemporary neo-colonialism.

(d) Meanwhile, colonialism lasted between 1900 and 1960 without adequate and proper planning for technological development of Nigeria. In fact, the colonial welfare plan introduced by the British colonial government in 1946 to 1955 never deemed it fit to address science and technology.

3.2.2 Post-colonial Era

(a) As the British Colonialists shift interest from Slave to Commodity trade, scientific institutions in Nigeria emerged during the colonial period particularly around mid-1960s, during which National Research Councils were established. It is pertinent to note that the current S&T capability was built between the late 1960s and the 1980s, a period characterized by military rule in Nigeria. During this period, there was growing concern of some military and civilian authorities to build up the country’s S&T competence as part of a broader project of national growth and self-sufficiency.

- (b) The concern to build up scientific, technological and industrial self-sufficiency within this period however, did not receive the desired support in the productive sector. Consequently, it remained for the most part, restricted to special segments of the state bureaucracy and the academia.
- (c) For most firms, including the multinationals and state-owned corporations, the origin of technologies used in their production activities was immaterial than their cost and reliability. Furthermore, there was little or no understanding of the effective mechanisms and policies leading to technological innovation in the productive sector.

3.3 Post-Independence

- (a) The concept of science and technological development in Nigeria evolved through the years after political independence in 1960; there was the concern for economic independence. The aim was that Nigeria should gradually reduce her dependence on Britain her former colonial master that dominated the production and distribution organization in Nigeria at that time.
- (b) Economic development was to progress in an orderly manner and no dislocation to the system was to be allowed. The existing companies were to be encouraged and new ones were to be attracted to increase investment. Nigeria government was given a big boost by favorable developments in the oil industry.
- (c) From what we can see, a lot of this revenue from oil was used to build bridges, construct high ways, build vehicle assembly plants, steel plants, aluminum smelter plants, the Kanji dam and other power generating stations, universities, polytechnics, etc. It is however difficult to quantify the extent of the involvement of Nigerian Scientists and

Technocrats in this respect since there is almost no special documentation on Nigerian including Muslim innovators .

3.4 Contributions of Nigerian Muslims

3.4.1 Muslim Scholars in different disciplines

Although there are a number of renowned Muslim scholars in the field of Science and Technology in Nigeria, notable among them include some prominent Muslim Professors in the field of Medicine, Sciences, Engineering etc.

(a) Medical Sciences

Emeritus Professor Lateef Akinola Salako NNOM; CON – a renowned Pharmacologist and Therapeutics at the University of Ibadan

Professor Babatunde Lawal Salako of College of Medicine, University of Ibadan is a Professor of Nephrology and an expert in hypertension and sickle cell disease. He has trained physicians in this as well as other areas of medicine. **Professor W.R. Johnson**, the current Provost, College of Health Sciences, University of Ilorin, Ilorin is a Muslim. **Professor Katibi**, a renowned cardiologist, **Professor Kuranga**, a Urologist, the current Director of Academic Planning and former CMD, UITH and **Professor Waheed Latinwo**, the CMD, UITH among many others.

Prof. Isa Marte Hussaini, a Fellow of the Nigeria Academy of Science from Borno, a consultant pharmacologist and specialist in cancer biology and research. He is presently ranked 4th among the most cited scientists on webometrics in the country, with over a hundred publications in national and international journals. His work on developing herbal

formulations for treatment of cancer has been acknowledged and well appreciated by notable health related organizations.

Professor (Mrs.) Odunola-Bakare, a Professor of Pharmaceutical- chemistry is a Muslim woman.

(b) Biological Sciences

Professor Nurudeen Olorun-Nmbe Adedipe is a renowned professor of Plant Physiology. He has contributed immensely in the field of Agriculture. He was the pioneer Vice Chancellor, University of Agriculture Abeokuta and former Chairman, National University commission (NUC) Standing Committee on Private Universities. He also served as Consultant to the United Nations Food and Agriculture Organisation (FAO), World Health Organisations (WHO), United Nations Educational Scientific and Cultural Organisation (UNESCO), United Nations Environment Programme (UNEP), the United Nations Childrens' Fund (UNICEF).

Professor Musbau A. Akanji FNSBMB; FNISEB also a professor of Biochemistry at University of Ilorin who has contributed to knowledge in the areas of Parasite Biochemistry and Cellular Toxicology. He carried out research on African trypanosomiasis and the effects of food additives on the human system. He is the Foundation Vice-Chancellor of Al-Hikmah University, Ilorin and is currently the Vice-Chancellor of Federal University of Technology, Minna.

Professor Hussein O. B. Oloyede, FNSBMB; FNISEB; FSAN is a Professor of Biochemistry at University of Ilorin who has contributed immensely to the field of Food, Nutrition and Environmental Biochemistry as well as Phytomedicine. He expounded areas like the relationship between dietary lipids and cellular and tissue lipid content. He

also studied the effects of lipid deficiency on growth and cellular constituents, among others. He is the Foundation Vice-Chancellor of Fountain University, Osogbo.

(c) Physical Sciences

Professor Momodu-Jamiu Oyawoye is the first Professor of Geology in Africa. He is a Fellow of Nigerian Mining and Geological Science and Fellow Nigeria Academy of Science

Prof. Iya Abubakar from Adamawa, former Senator and renowned Mathematician and a former Vice-Chancellor Ahmadu Bello University, Zaria.

Prof. Khalil Ibrahim Umar, foremost Physicist and former Vice-Chancellor of Bayero University, Kano.

(d) Engineering

Jelani Aliyu, a young architect from Sokoto, a senior automobile creative designer for US auto giant GM motors is well known for his exotic design of the luxurious Chevrolet volt brand. He is presently the CEO of a technology driven venture and inventor of an affordable solar power laptop.

Professor Sulayman O. Adeyemi, former Dean Faculty of Engineering, University of Ilorin and former Vice-Chancellor Federal University of Technology Minna is a well known Civil Engineer.

Professor Yinusa Alaro Jimoh, Fellow of Nigerian Society of Engineer and Current Dean of Engineering, University of Ilorin is a civil Engineer

Today, we have more young Muslim scholars in Nigeria advancing the development of science and technology. Examples are **Wasiu Adeyemo Lanre** (ranked 16th on

webometrics), an Associate Professor of Oral and Maxillofacial Surgery (Consultant Plastic Surgeon) at the Lagos University Teaching Hospital as well as **Musa Toyin Yakubu** (ranked 21st), Associate Professor of Biochemistry with interest in Phytomedicine, Toxicology and Reproductive Biochemistry at the University of Ilorin.

The names are by no means exhaustive others are as indicated in the Appendix.

3.4. Establishment of Islamic Universities in Nigeria

After the setting up of a World class Islamic University, the International Islamic University, Malaysia (IIUM), which was founded in May, 1983 and prides itself as the World's best in Islamic Banking and Islamization of knowledge, Islamic Universities began to emerge on the Nigerian soil. These are;

(a) Al-Qalam University, Katsina (formerly Katsina University, Katsina) was founded by Katsina Islamic Foundation in January 2005. The university has the pride of being the first Islamic University in Nigeria. The main distinguishing feature between the university and other conventional universities is the conduct of moral and academic regulations. This is expected to raise an educated, morally sound and Allah-fearing society which is the pride of any community or nation.

(b) Al-Hikmah University, Ilorin was founded in January 2005 by Abdul-Raheem Oladimeji Islamic Foundation (AROIF) Ilorin, Nigeria and World Assembly of Muslim Youth (WAMY) based in Jeddah, Saudi Arabia. Its mission is promoting both academic and moral excellence for the good of the Nigerian nation in particular and for furthering the cause of humanity in general. The motto is "Learning for wisdom and morality" and is aimed towards promoting academic

excellence and also ensuring moral and spiritual rightness of the youth, most especially in the face of imposing vicious challenges posed to humanity at large at the wake of the 21st century.

(c) Crescent University Abeokuta, Ogun State was founded by Islamic Mission for Africa (IMA) in June 2005. The mission of the university is to ensure the delivery of university education in ways that recognize personal discipline and integrity and promote societal values. The university is out to assist in closing the widening gap between attainable potential student population and limited space in Nigerian educational system.

(d) Fountain University, Oshogbo, Osun State was founded by Nasrul-Lahi-II-Fatih Society of Nigeria (NASFAT), a leading Islamic society in Nigeria in May 2007. The main objective of the university is to provide competitive and resourceful graduates with high moral standards. The university provides high level of teaching and learning opportunity for all people irrespective of race, tribe, religion or political inclination which is being achieved through effective programmes and services based on the provision of adequate facilities as well as professionally qualified and competent staff.

4. Impediments and Solutions for Development of Science and Technology in Nigeria

Consequent upon the foregone submissions, Science and technology in Nigeria is yet to attain the desired state of development and the following are noted as part of the impediments:

4.1 Generic Impediments

(a) Inadequate Funding: Both Government and Industries need to support scientific research with appropriate funds but only play lip services. Government allocates only about 0.47 - 0.61 % of GDP to the Federal Ministry of Science and Technology (FMST), whereas Israel, Japan Germany and South Korea allocate nothing less than 3 % of their own GDP. It should be noted

that the fund allocated to Federal Ministry of Science and Technology is mainly for the payment of staff salaries and emoluments while little or nothing is allocated specifically for research. This is reflected in the low number of high quality publications and patents applied for by Nigerians. Currently, Nigeria has initiated programs for the funding of research e.g TERTFund, the success and performance of these interventions are yet to achieve the desired effects.

Both government and industries should make more funds available for research geared towards solving problems related to health, environment, infrastructure agriculture and economic development in Nigeria.

(b) Inadequate collaborative efforts among Scientists and Researchers and Industries :

Appropriate training and utilization of scientists and technologists are profitable and beneficial for social well being and advancement of science and technology to positively impact on the daily life of Nigerians. Experts in the field of science instead of collaborating with host community to solve the prevailing problems in their communities look down on others. The above attitude has made Nigerian scientists to be more irrelevant to the needs and aspirations of their society even though they are talented and adequately trained experts. Nigerian scientists are well versed in techniques and methodology of science but they failed in adapting their acquired knowledge to solve the problem facing the society that paid for their education and training.

There is need for encouragement and support for researchers via training, and utilization of home-grown expertise and indigenous technology.

(c) Inadequate support by Government: The preference which the Government gives to foreign expertise and consultants does not encourage the development of indigenous

scientists as well as their local start-ups or companies, hence retarding the development of science and technology.

There is a need for implementation of science and technology policy as well as support for local content and start-up companies borne out of research findings of our tertiary and research institutes.

(d) Lack of Collaboration between Scientist and Industries: The available conglomerate has refused not only to fund but also severe collaboration with the researchers, thereby leading to a lull in Industry-driven research and problems with translation of research findings into products as well as non-application of such findings by the industries.

The divide between the industry and academics / research needs to be bridged. Problems and challenges within the industry in Nigeria can be solved by Nigerian Scientists / Researchers with proper funding from such conglomerate and Government.

(e) Educational System: Basic ingredients of Science and Technology are not well laid out in the curriculum of Nigeria Child Education. Even when introduced, it is cumbersome that many students prefer other disciplines. Inadequate, inexperienced, lack of expertise and proliferation of unqualified science teachers in the post-basic schools is alarming and this menace grossly affects the performance of the few interested science students.

Reforms in Education are direly required.

(f) Infrastructural facilities: This is critical for the advancement of science and technology especially at the tertiary level. Unfortunately, lack of basic research apparatus, chemicals, equipment in our tertiary institutions is a major setback for effective utilization of the

skills and transfer of technology acquired by Scientists in Nigeria. Other basic infrastructures that are generally at moribund such as power and water also affect development of science and technology in the country.

New and diverse technologies such as Nuclear Facilities, Solar Farms, More Gas Turbines should be targeted to improve power generation.

4.2 Impediments specific for Muslim Scientists

There are several factors responsible for the seeming weakness of science and technology development among Nigerian Muslims. The following points illustrate these impediments and the possible solutions to improve Muslim contributions to science and technology in Nigeria:

- (a) **Dearth of data and documentation.** Nigeria is poor in terms of statistical data and documentation. There is no single database that contains records of Nigerian Muslim scientists and their contributions. We can start from this gathering by launching this campaign. Networking with Muslim Scientists both within and outside the country is hereby encouraged. And collaboration with others as we deemed fit.

- (b) **Lack of commitment by Muslim scientists.** For instance, Nigerian Islamic universities are suffering far more than other institutions in respect of inadequate Muslim Ph.D. holders, who prefer public Universities because of the financial advantage. Muslim scientists should be encouraged to make sacrifices and contribute to the training of Muslim students who have passion for science related subjects.

- (c) **Inadequate funding of Islamic universities by Proprietors.** Muslims should show increased sense of ownership to Islamic universities by contributing to them as if they own these institutions.
- (d) **Poor mentoring.** The older and more experienced scientists are not very alive to their responsibilities of mentoring and guiding the relatively younger scientists. This has weakened the strength of science and technology in Nigeria generally and among Muslims in particular. Trainees are frustrated out of doctorate programmes by supervisors and institutions.
- (e) **Poor motivation.** The society at large and the Nigerian corporate organizations are more interested in funding street dance concerts and musical awards than providing scholarships to young and brilliant scientists. Individuals and Muslim groups should sponsor indigent but brilliant students to study science and technology disciplines.
- (f) **Lack of focus.** Islamic universities should be focused on academic programmes by designing their Curriculum to include Islamization of Knowledge. This will enhance their contribution to the development of science and technology in Nigerian and also contribute positively to the Muslim society. No Nigerian Islamic university offers Astronomy as an academic degree programme, which can unify the Muslim society in terms of moon sighting. It will also strengthen scientific learning since Astronomy cannot be studied without deep rooted understanding of the physical sciences like Mathematics, Computer Science, Physics, Chemistry and Geology. No Nigerian Islamic university also offers

Prophetic medicine as an academic degree programme, which will provide solutions to many ailments that have become mysterious to orthodox Medicine. This will also encourage the study of medicine since Prophetic medicine will rely on deep understanding of medical and pharmaceutical disciplines. Individuals and Muslim groups should provide facilities for Muslim scientists to carve a niche for themselves in these areas.

5. The Way Forward

Allah has enjoined on us, Reading (**Learning**) and has empowered us to reflect and utilise (**Science and Technology**) all He has given to us on land, in the sea and in the entire universe. Everything He has given to us is meant to be used to worship Him alone. And full submission to His will is required. Refusal to submit to Allah (Islam) is tantamount to forgetting Allah. He says “those who forget Allah forget their own souls and in the end they will be the losers. Those who do not remember Allah, Allah will make their lives to be harsh on them and the judgement day they will be raised blind” (Q17:69-71). Therefore, if we submit to Allah fully (**Islam**), He will make it easier for us to utilize Science and Technology and make our lives easier for us. Islam has greatly emphasized on the importance of education to conquer the forces and resources of nature. That is possible only through the acquisition of adequate knowledge through a well-balanced, elaborate and all-embracing system of education. It involves harnessing human potential and then to utilize external forces in subservience to the Qur’anic values for the benefit of all the mankind. This provides us “identity, self-discipline and academic pursuits - all of the highest excellence but our difficulty is that we overpower the forces of nature (Science and Technology) without being able to overwhelm the forces which lie within ourselves (submission).

7 Summary and Concluding Remarks

The foregoing submission defines Islam and briefly highlights its characteristics; it employs evidences from the verses of the Holy Quran and establishment of Islamic Institutions amongst others to address the nexus between Islam and Science and Technology. The information on the development of Science and Technology in Nigeria as portrayed by the Pre-Colonial to the Post-Independence Era were briefly documented with a view to capturing the possible contributions of Nigeria Muslims. The impediments to the development of Science and Technology are highlighted with possible solutions in particular as relates to Nigeria Muslims. It is considered that the way forward lies in the acquisition of knowledge and the complete submission to Allah-Islam.

I acknowledge and appreciate the contribution and support of Dr. A. K. Salau of Fountain University, Osogbo as well as Dr. M.O. Salawu and my Ph.D. students (Messrs Akolade Jubril, Amuzat Aliyu and Ganiyu Aderounmu) of the Department of Biochemistry University of Ilorin, Ilorin in coming up with this paper.

I appreciate Islamic Welfare Foundation (IWF) for giving me the task which has enriched my knowledge.

Jazakumllah khayran.

Appendix

List of Muslim Contributors to the development of Science and Technology in Nigeria

S/No.	Name	Field	Specialization	Institution
1	Prof. Dadari	Agriculture	Agronomy	ABU Zaria
2	Prof. Hamza mani	Agriculture	Agronomy	ABU Zaria
3	Prof. I.U. Abubakar	Agriculture	Agronomy	ABU Zaria
4	Prof. Zakari Abdulsalam	Agriculture	Agric. Econs.	ABU Zaria
5	Prof. A. U. Jungur	Agriculture	Agric. Econs.	FUT Yola
6	Prof. Rabiu Sani	Agriculture	Crop protection	ABU Zaria
7	Prof. M.I. Faguji	Agriculture	Plant Science	ABU Zaria
8	Prof. Ado Garki	Agriculture	Plant Science	ABU Zaria
9	Prof. A. L. Ala	Agriculture	Livestock Economics	UDUS Sokoto
10	Prof. B. F. Umar	Agriculture	Rural Sociology	UDUS Sokoto
11	Prof. B. Z. Abubakar	Agriculture	Agric Extension and Community Development	UDUS Sokoto
12	Prof. B. A. Raji	Agriculture	Soil Science	Unilorin
13	Prof. Maruf Adeboye	Agriculture	Soil Science	
14	Prof. H. M. Tukur	Animal Science	Animal Nutrition	UDUS Sokoto
15	Prof. W. Akin Hassan	Animal Science	Animal Production	UDUS Sokoto
16	Prof. S.A. Maigandi	Animal Science	Ruminants Nutrition	UDUS Sokoto
17	Prof. A. Abubakar	Animal Science	Poultry production	UDUS Sokoto
18	Prof. B. S. Malami	Animal Science	Pasture	UDUS Sokoto
19	Prof. Y.A. Bashar	Animal Science	Animal Biochemistry	UDUS Sokoto
20	Prof. M. Jibir	Animal Science	Animal Production	UDUS Sokoto
21	Prof. Mahmud Nyako	Animal Science		FUT Yola
22	Prof. Mohammed Baba Ardo	Animal Science		FUT Yola

23	Prof. M. D Magaji	Crop Science	Crop Production	UDUS Sokoto
24	Prof. A. I. Yakubu	Crop Science	Weeds Science	UDUS Sokoto
25	Prof. N. D. Ibrahim	Crop Science	Crop Protection (entomology)	UDUS Sokoto
26	Prof. L. Abubakar	Crop Science	Agronomy- Plant Breeding	UDUS Sokoto
27	Prof. Ibrahim umar	Crop Science	Crop Protection	FUT Yola
28	Prof. Abdullahi Sajo	Crop Science	Crop Protection	FUT Yola
29	Prof. A.M. Shinkafi	Forestry and Enviroment	Siviculture	UDUS Sokoto
30	Prof. A. G Bello	Forestry and Enviroment	Forest Management	UDUS Sokoto
31	Prof. A. U Dikko	Soil Science and Engineering	Soil Chemistry	UDUS Sokoto
32	Prof. S. S. Noma	Soil Science and Engineering	Pedology	UDUS Sokoto
33	Prof. M. A. Akanji	Biochemistry	Toxicology and Phytomedicine	Unilorin
34	Prof. H.O. B. Oloyede	Biochemistry	Food, Nutritional and Enviromental Biochemistry	Unilorin
35	Dr. M. T.Yakubu (Reader)	Biochemistry	Reproductive and Toxicology	Unilorin
36	Prof. M.N. Shuaibu	Biochemistry	Biochemical Parasitology	ABU Zaria
37	Prof. Sani Ibrahim	Biochemistry	Biotechnology	ABU Zaria
38	Prof. I.A. Umar	Biochemistry	Medical Biochemistry	ABU Zaria
39	Prof. H.M. Inuwa	Biochemistry	Plant Biochemistry	ABU Zaria
40	Prof. M. K. Abubakar	Biochemistry	Spectroscopy	UDUS Sokoto
41	Prof. M. Lawal	Biochemistry	Spectroscopy	UDUS Sokoto
42	Prof. R. A. Shehu	Biochemistry	Protein Biochemistry	UDUS Sokoto
43	Prof. M. J. Ladan	Biochemistry	Clinical Biochemistry	UDUS Sokoto
44	Prof. L. S. Bilbis	Biochemistry	Enzymology	UDUS Sokoto
45	Prof. M. G. Abubakar	Biochemistry	Toxicology	UDUS Sokoto
46	Prof. R. A. Umar	Biochemistry	Mol. Biology	UDUS Sokoto

47	Prof. Y. Saidu	Biochemistry	Nutritional Biochemistry	UDUS Sokoto
48	Prof. S. W. Hassan	Biochemistry	Pharmacological & Toxicological Biochemistry	UDUS Sokoto
49	Prof. Abdullahi U. Wurochekke	Biochemistry		FUT Yola
50	Prof. A.K. Adamu	Biological Sciences	Parasitology	ABU Zaria
51	Prof. Qamar Majeed	Biological Science	Entomology	UDUS Sokoto
52	Prof. Usman Abubakar	Biological Science	Parasitology	UDUS Sokoto
53	Prof. Bashar Ladan Aliero	Biological Science	Ecology	UDUS Sokoto
54	Prof. Tukur Adamu	Biological Science	Parasitology	UDUS Sokoto
55	Prof. Sanusi Muh'd	Biological Science	Plant Pathology	UDUS Sokoto
56	Prof. A. A. Aliero	Biological Science	Plant Genetic /Physiolog/Phytomedicine	UDUS Sokoto
57	Prof. Abubakar Kotos	Biological Science	Fisheries	FUT Yola
58	Prof. Uzairu Adamu	Chemistry	Physical Chemistry	ABU Zaria
59	Prof. A.A. Zuru.	Chemistry	Physical Chemistry	UDUS Sokoto
60	Prof. F. A. Adekola	Chemistry	Industrial Chemistry	Unilorin
61	Prof. L.G. Hassan	Chemistry	Organic Chemistry	UDUS Sokoto
62	Prof. S. M. Dangoggo	Chemistry	Renewable Energy	UDUS Sokoto
63	Prof. U. A. B/Yauri	Chemistry	Analytical Chemistry	UDUS Sokoto
64	Prof. A. I Tsafe	Chemistry	Analytical Chemistry	UDUS Sokoto
65	Prof. B. B. Usman	Chemistry	Renewable Energy	UDUS Sokoto
66	Prof. U. Z. Faruk	Chemistry	Natural product	UDUS Sokoto
67	Prof. Buba Aliyu	Chemistry		FUT Yola
68	Prof. D.D. Yusuf	Engineering	Agric. Engineering	ABU Zaria
69	Prof. R.A. Abubakar	Engineering	Agric. Engineering	ABU Zaria
70	Prof. S.Z. Abubakar	Engineering	Agric. Engineering	ABU Zaria
71	Prof. M.L. Sulaiman	Engineering	Agric. Engineering	ABU Zaria

72	Prof. D.D. Yusuf	Engineering	Agric. Engineering	ABU Zaria
73	Prof. A.A. Ramalan	Engineering	Agric. Engineering	ABU Zaria
74	Prof. M.A. El-okene	Engineering	Agric. Engineering	ABU Zaria
75	Prof. M.A. Oyeboode	Engineering	Agric. Engineering	ABU Zaria
76	Prof. Shehu Iya	Engineering	Agric. Engineering	FUT Yola
77	Prof. Oyeboode	Engineering	Agric. Engineering	
78	Dr. S. A. Raji	Engineering	Civil Engineering	Unilorin
79	Prof. Abdulganiyu Bakare	Engineering	Electrical Engineering	
80	Prof. Y.S. Aliyu	Engineering	Met. Engineering	ABU Zaria
81	Prof. M.A. Ibrahim	Engineering	Met. Engineering	ABU Zaria
82	Prof. AbdulKabir Radicals	Engineering	Met. Engineering	FUT Yola
83	Prof. Mohammed E. Ibrahim	Engineering	Met. Engineering	FUT Yola
84	Prof. Ibrahim Jaro Musa	Geography	Geomorphology	ABU Zaria
85	Prof. Abdullahi Liman Tukur	Geography		FUT Yola
86	Prof. Mala Galtima	Geography		FUT Yola
87	Prof. Abba Bashir	Geography		FUT Yola
88	Prof. Ibrahim Garba	Geology	Mineral exploration	ABU Zaria
89	Prof. Danbatta Umar Adamu	Geology	Mineral exploration	ABU Zaria
90	Prof. Nura Muhammad	Geology		FUT Yola
91	Prof. B. Sani	Mathematics	Statistics	ABU Zaria
92	Prof. G.U. Garba	Mathematics	Statistics	ABU Zaria
93	Prof. S.B. Junaidu	Mathematics	Computer Science	ABU Zaria
94	Prof. A.A. Tijjani	Mathematics	Computer Science	ABU Zaria
95	Prof. A. A. Ibrahim	Mathematics	Abstract Algebra	Unilorin
96	Prof. H.S. Isah	Medicine	Surgery	ABU Zaria
97	Prof. A.H. Rafindadi	Medicine	Surgery	ABU Zaria

98	Prof. A.G. Bakari	Medicine	Endocrinology	ABU Zaria
99	Prof. B.G. Sani	Medicine	Surgery	ABU Zaria
100	Prof. N M A Jiya	Medicine	Paediatrician	UDUS Sokoto
101	Prof. I. A. Mungadi	Medicine	Professor of Surgery	UDUS Sokoto
102	Prof. S.O. Bello	Medicine	Professor of Pharmacology	UDUS Sokoto
103	Prof. M.T.O. Ibrahim	Medicine	Professor of Community Medicine	UDUS Sokoto
104	Prof. B.B. Shehu	Medicine	Professor of Neurosurgery	UDUS Sokoto
105	Prof. Hamidu Ahmed	Medicine	Paediatrician	UDUS Sokoto
106	Prof. W. B. R. Johnson	Medicine	Child Health and Paediatrics	Unilorin
107	Prof. A. A. Akande	Medicine	Chemical Pathology and Immunology	Unilorin
108	Prof. A. B. Okesina	Medicine	Chemical Pathology and Immunology	Unilorin
109	Prof. I. A. Katibi	Medicine	Medicine	Unilorin
110	Prof. A. K. Salami	Medicine	Medicine	Unilorin
111	Prof. A. O. Mahmoud	Medicine	Ophthalmology	Unilorin
112	Prof. S. A. Kuranga	Medicine	Surgery	Unilorin
113	Prof. A. W. O. Olatinwo	Medicine	Ophthalmology and Surgery	Unilorin
114	Prof. A. Sanni	Microbiology	Environmental Microbiology	Unilorin
115	Prof. Ado Saleh	Microbiology	Computer Science	ABU Zaria
116	Prof. S. B. Manga	Microbiology	Medical/Pharmaceutical Microbiology	UDUS Sokoto
117	Prof. Aliyu Ahmad Alkali	Microbiology		FUT Yola
118	Prof. U.U. Pateh	Pharmacy	Clinical	ABU Zaria
119	Prof. M.S. Abubakar	Pharmacy	Pharmacognosy	ABU Zaria
120	Prof. I. Hajara	Pharmacy	Pharmacognosy	ABU Zaria
121	Prof. A.E. Muktar	Pharmacy	Pharmacognosy	ABU Zaria
122	Prof. Y.K.E. Ibrahim	Pharmacy	Clinical	ABU Zaria
123	Prof. Agunu	Pharmacy	Pharmacognosy	Unilorin
124	Prof. Mrs	Pharmacy	Pharmaceutical chemistry	Unilorin

	Odunola			
125	Prof. S. U. Gulumbe	Statistics	Apply Statistics	UDUS Sokoto
126	Prof. B. L. Adeleke	Statistics		Unilorin
127	Dr. A. W. Yahya	Statistics		Unilorin
128	Prof. Nasiru Rabi	Physics	Nuclear Physics	ABU Zaria
129	Prof. Adam Usman	Physics	Physics	FUT Yola
130	Prof. Balogun	Physics	Nuclear Physics	
131	Prof. I.A. Babatunde	Textile	Polymer Tech.	ABU Zaria
132	Prof. Y.M. Kabir	Textile	Polymer Tech.	ABU Zaria
133	Prof. A.I. Abdulkadir	Veterinary medicine	Veterinary medicine	ABU Zaria
134	Prof. S.U. Abdullahi	Veterinary medicine	Veterinary medicine	ABU Zaria
135	Prof. G.S.A. Muhammad	Veterinary medicine	Veterinary medicine	ABU Zaria
136	Prof. M.Y. Fatihu	Veterinary medicine	Veterinary medicine	ABU Zaria
137	Prof. N.D.G. Ibrahim	Veterinary medicine	Veterinary medicine	ABU Zaria
138	Prof. M. Mamman	Veterinary medicine	Veterinary medicine	ABU Zaria
139	Prof. A. I Daneji	Veterinary Medicine	Veterinary Medicine	UDU Sokoto
140	Prof. A. A. Magaji	Veterinary Medicine	Veterinary Public health	UDU Sokoto
141	Prof. M. A. Umaru	Veterinary Medicine	Veterinary Therigenology	UDU Sokoto
142	Prof. A. U. Junaidu	Veterinary Medicine	Veterinary Public health	UDU Sokoto
143	Prof. B. M. Agei	Veterinary Medicine	Veterinary Pharmacology	UDU Sokoto
144	Prof. U. M. Chafe	Veterinary Medicine	Veterinary Medicine	UDU Sokoto
145	Prof. G. H. Sharubutu	Veterinary Medicine	Veterinary Medicine	UDU Sokoto
146	Prof. Abdulkadir Alhaji	Veterinary Medicine	Vet. Medicine	
147	Prof. Aliyu Otaru	Veterinary Medicine	Vet. Pharmacology	
148	Prof. Gbaji Abdularahman	Veterinary Medicine	Vet. Anatomy	

149	Prof. Mamman	Veterinary Medicine	Vet. Pharmacology	
150	Prof. Kazeem H.	Veterinary Medicine	Vet. Virology	
151	Prof. Hassan Zoaka	Veterinary Medicine	Vet. Surgery	
152	Prof. Lawal Saidu	Veterinary Medicine	Vet. Medicine	
153	Prof. N. D. G Ibrahim	Veterinary Medicine	Vet. Pathology	
154	Prof. S. O Salami	Veterinary Medicine	Vet. Anatomy	Unilorin
155	Prof. Jinad Kabir	Veterinary Medicine	Vet. Public Health	
156	Prof. M. A Raji	Veterinary Medicine	Vet. Microbiology	
157	Prof. S. U. Abdullahi	Veterinary Medicine	Vet. Medicine	
158	Prof. U. S Abdullahi	Veterinary Medicine	Vet. Medicine	
159	Prof. S. F Ambali	Veterinary Medicine	Vet. Toxicology	Unilorin
160	Prof A. G Ambali	Veterinary Medicine	Vet. Medicine	Unilorin
161	Prof. A. A Baba	Veterinary Medicine	Vet. Virology	
162	Prof. J. D Ameen	Veterinary Medicine	Vet. Medicine	UniMaid
163	Prof. Ribadu	Veterinary Medicine	Vet. Parasitology	
164	Prof. Oduye	Veterinary Medicine	Vet. Pathology	
165	Prof. Agaie	Veterinary Medicine	Vet. Surgery	
166	Prof. Ahmed	Veterinary Medicine	Vet. Parasitology	
167	Prof. Sharubatu	Veterinary Medicine	Vet. Medicine	

References

Akinrinade A 2003. Osogbo, Field Work.

Olaoye R A 1990. Indigenous Technology in Nigeria. *The Chronicler, Journal of the Students' Historical University of Ilorin*, 7: 2-4.

Onimode Bade 1982. *Path to Nigeria Development*. Ibadan.UPL.

Onipede Kayode 2003. Technology Development in Nigeria; An Assessment. *Paper Presented at a seminar of the Department of History, University of Ilorin*. April 4, 2003.

Onipede Kayode 2004. The Challenges of Industrialization in Nigeria. *Working papers*.

Onipede K.J. (2010). Technology Development in Nigeria: The Nigerian Machine Tools Industry Experience *J Economics*, 1 (2): 85-90

Stride G T, Ifeka C 1975. *People and Empires of West Africa; 1000-800AD*. Lagos. Nigeria.

UNDP (2013). Human Development Report <http://hdrstats.unpd.org/en/tables/>

World Bank (2011): List of Countries by GDP Per Capital:

<http://data.worldbank.org/indicator/NY.GDP.PCAP.KN>

Tomori O. (2011). Under- developing Nigeria: The conspiracy of Science Society and Nigerian. *Academy of Science Quarterly Lecture*.