



Science Education in Nigerian Public Universities: Challenges and Way Forward

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ABSTRACT

Science education is faced with many problems in the Nigerian public universities and this is affecting the development of science education at the various public universities across the country. This presentation discusses the challenges facing teaching of science education in the Nigerian public universities. Secondary and primary data were sourced and used to support the points raised in the presentation. Inadequate funding, inadequate science lecturers, shortage of infrastructural facilities, Brain-drain, poor research, strike action and corruption were identified as challenges facing the teaching of science education in the Nigerian public universities. Adequate funding of science programme in the public universities, employment of more science lecturers, provision of adequate infrastructural facilities, increasing the funding of research programme in sciences, increasing the salaries of academic staff to prevent brain-drain and to motivate the lecturers, implement agreement reached with the unions in the universities and corruption in the universities should be fought using the various anti-corruption agencies in the country were recommended as the ways forward for the development of science education in Nigeria public universities.

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1. Introduction

Public universities are universities owned by the government and established to provide higher educational service to the general public. Ogunode (2020) observes that public universities are universities owned by the government. Public universities are universities established to provide post-secondary schools for Nigerian. Public universities are universities established by act of parliament to serve the interest of the general public. Public universities deal with the provision of teaching, research and communities services. The objectives of the universities in Nigerian Higher education, including professional education has the following aims: the acquisition, development and inculcation of the proper value orientation for the survival of the individual and societies; the development of the intellectual capacities of individuals to understand and appreciate environment; the acquisition of both physical and intellectual skills which will enable individuals to develop into useful members of the community; the acquisition of an overview of the local and external environments (FGN, 2014).

The universities education are designed to offered many academic programme. Some universities are specially designed for science programme, other for research purposes while other are conversional in nature offering all forms of programme. Majorities of public universities in Nigeria are offering science programme that is science education programme.

Science education in the Nigerian public universities are facing a lot of challenges (Ogunode, &Aiyedun, 2020). Based on this submission, this presentation intends to discuss the challenges facing science education in Nigerian public universities.

2. Concept of Science Education

Olatunde-Aiyedun& Ogunode, (2021) observes that Science Education is the main component of school curricula in almost every country. Hence, it is essential to maintain and develop the technical infrastructures, national securities and economic prosperities for the future. If well developed and executed, Science Education can provide a stable flow of graduates into high-level jobs that require advanced scientific knowledge and expertise (Millar, 2011). That is why some countries tend to invest significantly in the training of science teachers. Such training aims to equip them with effective skills in teaching that will enable them to —prepare and produce graduates needed to support economic growth and prosperity| (OECD, 2012). Additionally, Millar argued that Science Education should provide learners with the kind of understanding of science that citizens in a modern democracy should have. Every education system must strive in developing and promoting learners‘ scientific literacy for —active citizenship and engagement of science as a cornerstone of contemporary culture| (Millar, 2011).

3. Challenges facing Science education in Nigerian public Universities

Inadequate funding, inadequate science lecturers, shortage of infrastructural facilities, Brain-drain, poor research, strike action and corruption will be used to discuss the challenges facing science education in Nigerian public universities.

3.1. Inadequate Funding

Inadequate funding is a major problem facing the science education in Nigerian public universities. Science education drives it budgetary allocation from the general budget of the universities which have been described as inadequate by (Ogunode, 2020). Ogunode, &Aiyedun (2020) submitted that inadequate funding is one of the major problem facing the administration of science programme in the Nigerian higher institutions. Annual budgetary allocation for the administration and management of science programme is not adequate. The administration of science programme is very cost intensive. So,

more funds are needed to effectively implement science programme in higher institutions across the country. Emmanuel, & Daniel, (2017) observed that the issue of funding by the government and other relevant authorities has been a major challenge to mathematics education and science education. The budgetary allocation to the education sector has been grossly inadequate as compared to funding from both developed and some developing countries. In Nigeria, education sector has not received top-most priority in budgetary allocation as it deserves over the years. Ogunode (2020) submitted that the poor funding of public universities in Nigeria is responsible for the poor quality of education and decay infrastructural facilities. The inability of the government to objectively implement the UNESCO 26% recommendation for the funding of education in Nigeria is contributing to the poor performance of the public universities in the country. The factors responsible for inadequate funding of public universities in Nigeria include lack of political will, corruption, increase in population, inflation, fall in national revenue and poor financial planning. The implications of underfunding of the public universities include; inadequate infrastructural facilities, shortage of academics staff, poor quality of education, brain-drain and strike action. Ogunode (2020) observes that the problem of inadequate teachers in public universities is caused by underfunding of the universities corruptions, brain-drain, poor motivation, unconducive working environment and lack of manpower planning. The implication of shortage of academic staff in the Nigerian public universities include high student –teacher ratio, poor learning, poor delivery of teaching, low productivities and poor quality of education.

3.2. Inadequate Science Lecturers

Science lecturers are vital to the development of science education. Science lecturers are implementer of science curriculum in the higher institutions. The place of science teachers in the development of science education cannot be underestimated. It is unfortunate that as important as science teacher to the social, economic and technological advancement and development of the society that majorities of the public higher institutions do not have adequate science lecturers in the various science departments and faculties. This problem is confirmed by Ogunode, & Aiyedun, (2020) who opines that another problem facing the administration of science programme in the Nigerian higher institutions is the challenge of inadequate science lecturers. Data from the NUC revealed that universities experience an acute shortage of teaching staff in computer science and technology-based disciplines, but teaching staff shortage is very acute in disciplines such as law, engineering, medicine and surgery. These shortages are attributed to several reasons, such as poor incentives for serving teachers, inadequate turnout of teachers in these subjects by teacher-training institutions in the country, and the exodus of lecturers to Western countries in search of greener pastures (NEEDS,2014). Ogunode (2020) concludes that inadequate academic staff is another major problem facing the administration of public universities in Nigeria. Many public universities in Nigeria are understaffed and lack the financial capacity to employ adequate staff. The Nigerian universities are faced with the problem of shortage of lecturers in many departments and faculties especially in programme like the sciences (Ogunode & Abubakar,2020). The shortage of lecturers in many departments and faculties is responsible for high teacher-student ratio in the Nigerian universities. The inadequate academic staff is preventing effective administration of public universities in Nigeria.

3.3. Shortage of Infrastructural Facilities

Shortage of infrastructural facilities is another big problem facing the teaching of science education in the Nigerian public universities. Noun (2012) observed that physical plants required for teaching, learning and researching include classrooms, laboratories, workshops, staff offices and libraries. Others include hostels (in residential institutions), staff quarters, students and staff recreational facilities, sports and games facilities. Ogunode, & Aiyedun, (2020) observed that infrastructural facilities are very

important in the administration of science programme. Infrastructural facilities are social capital that every higher institutions must have in adequate to be able to implement the science programme effectively. Ogunode (2020) refers infrastructural facilities to include classrooms, offices, exam halls, laboratories, tables, chairs, desks, power supply, water, good roads network within the schools etc. Ogunode (2020) cited Ebehikhalu&Dawam (2017) who observed that most of the laboratory furnishings are dilapidated and relevant equipment are lacking. The available thought inadequate equipment is not functional and obsolete. Sometimes, the laboratories double as lecture rooms. The library is not conducive for learning. Provision of ventilation is very poor with inadequate lighting, overcrowded and stuffy. At the main campus, there was only one central, inadequately equipped engineering workshop for eight programmes. The campus is overcrowded with a high density of activities, and the land is threatened by deep gully erosion. The authority could not connect the university to the water supply. Only two bore holes are currently functional. Electricity is one of the research resources that must be constant to aid conduct of research in the laboratories, but it is unfortunate that unstable power supply is affecting the development of research in the Nigerian public universities. Paul (2015) and Odiegwu, (2009) submitted that the prevalent epileptic kind of power supply cannot support meaningful research activities in higher institutions of learning in Nigeria. Statistics have shown that poor electricity supply in the country is endangering the growth of the critical sectors of the economy in which the education sector is not singled out. In the education sector, only a trickle of daily electricity production reportedly goes in to the country's 93 higher institutions of learning.

3.4. Brain-drain

Many academic staff that are supposed to be lecturing and mentoring the students in mathematics education here in Nigeria are leaving every day to abroad for a better job. Oni (2000) observed that many experienced and young lecturers are fleeing from the frustration of university life into more rewarding and more challenging sectors of the economy and even migrate to other countries. The result of the faculty exodus is observed in the quality of graduates that our universities produce. There is diminishing scope of mentoring junior researchers by seasoned and senior lecturers in Nigeria due to brain drain. Brain drain has led to decline in research outputs from institutions of higher learning in Nigeria vis-à-vis the disappearance of research centers in Nigerian universities. Ogunode (2020) submitted that the Academic Staff Union of Universities (ASUU) has warned the Federal Government against encouraging brain drain with a lingering strike and nonchalant attitude towards the yearnings of ASUU. Prof. BiodunOgunyemi, the President, ASUU, said Ethiopia has already recruited 200 professors from Nigeria while South Africa, Ghana, Egypt, etc have a sizeable number of Nigerian professors. In 2006, Ethiopia engaged the services of 600 professors, according to OlusegunAkinsanya, the former Nigeria's Ambassador to Ethiopia. Akinsanya added that over 3,000 Nigerians were living in Ethiopia and that most of them were professionals who were doing very well in their chosen career. A few months ago, Ethiopia came to recruit 200 professors from Nigeria. "I don't want to talk of South Africa. Go to Ghana, Egypt, you will see them there. We treat our scholars with discontent. Each time they step out, they are highly valued and highly-priced (Tribuneonline, 2020). The mass movement of academicians from the Nigerian public universities is affecting the administration of the universities because academic staff are very important for the implementation of universities' programme. Factors responsible for Brain-drain in the Nigerian public universities include; poor motivation, unconducive working environment, insecurity, underfunding and political interferences. The implication of brain-drain in the Nigerian public universities include; shortage of lecturers, poor quality of education and high student-teacher ratio.

3.5. Poor Research

Research according to Bako (2005) is a systematic search and investigation for increasing the sum of knowledge; and research and development (R&D) as the search and application of this knowledge for the development of improved products, services and industrial processes of capital development. Research is seen by Ajoku(undated) as the search for knowledge, truth, similarities and relationships, and finding solutions to problems through the systematic collection, analysis and interpretation of data. Ogunode, Jegede, Adah, Audu, Ajape (2020) observed that inadequate research fund is a major problem facing research programme in the Nigerian public universities. The budgetary allocation for the administration of research programme is not adequate. Udida et al. (2009) observed that the inability of the Nigerian government to accept and implement the 26% funding formula for education recommended by the UNESCO impact negatively on the performance and sustainability of higher education. Thus, it has become obvious that Nigeria's neglect of the funding formula is detrimental to higher educational institution performance and development aspiration as quality performance is the veritable instrument for sustenance of education system. Ogunode, et.al. (2020) identified; inadequate research funding, unstable academic calendar/strike Actions, inadequate infrastructural facilities, brain-drain, insecurity, corruption, poor technological advancement/poor ICT literacy. Others are poor participation of private sector in research development and lack of conducive working (research) environment as problems facing the administration of research programme. To address these problems, this article recommends adequate funding of research, provision of adequate infrastructural facilities, ensure stable academic staff, fight all institutions in the universities, ensure adequate security in the universities, encourage private participation in the development of research, provision of conducive research environment and Soften of the conditions attached to research Grant.

3.6. Strike Actions

Ogunode, &Aiyedun, (2020) submitted that strike action by different union groups in the Nigerian higher institutions is another problem preventing smooth administration of science programme across the Nigerian higher institutions. Ogunode (2020) observes that Strike actions in the Nigerian public universities is another problem facing the administration of public universities in Nigeria. The Nigerian public universities are known for continuous strike actions by different union groups in the public universities. The continuous strike actions by these different union groups are frustrating the administration of public universities in Nigeria. The reasons for the strike actions by different union groups include; underfunding of the public universities, inadequate infrastructural facilities, poor implementation of agreement reached with union groups and poor working condition. The implications of the continuous strike actions on the public universities include; disruption in the academic programme, poor quality of education, bad image for the universities, poor ranking internationally and poor patronage of public universities in Nigeria

3.7. Corruption

Ogunode (2020) opines that corruption in the public universities in Nigeria is another problem preventing effective administration of public universities in Nigeria. The high rate of corruption in the Nigerian public universities has hindered effective administration of the universities. Many public universities are in the present condition because of the corruption in the system. Ogunode, et.al. (2020) submitted funds release by the government for the administration and development of research programme in the public universities have been mismanaged and misappropriated. Some funds are been looted by the researchers or lecturers. Ogunode &Abubakar (2020) submitted that corruption has penetrated the Nigerian higher institutions. The limited funds made available by the government for the development of programme, research and infrastructural facilities end up in private hands or are been

diverted for personal use. Ogunode, et. al. (2020) cited Premium Times (2020) who submitted that the Tertiary Education Trust Fund (TET Fund) has accused lecturers across the country's public tertiary institutions of diverting research grants to build homes, purchase cars, and engage in other frivolous activities. This is coming days after an allegation of personnel budget inflation leveled against some academic and healthcare institutions including the University of Ibadan, by the Independent Corrupt Practices and other Related Offences Commission (ICPC), was made public. He said: "It is sad to note that public funds made available to lecturers to conduct groundbreaking and demand-driven researches towards solving Nigeria's socio-economic, and even political challenges, are misappropriated by those who are expected to be above board. I mean the beneficiaries of our grants. Lamido (2013), submitted that the level of corruption in the country has assumed a threatening dimension which is also dangerous and destructive to the economy. This definitely has negative effects on education and research.

4. Way Forward

To solve these challenges, the presenters hereby recommended the following; Adequate funding of science programme in the public universities, employment of more science lecturers, provision of adequate infrastructural facilities, increasing the funding of research programme in sciences, increasing the salaries of academic staff to prevent brain-drain and to motivate the lecturers, implement agreement reached with the unions in the universities and corruption in the universities should be fought using the various anti-corruption agencies in the country were recommended as the ways forward for the development of science education in Nigeria public universities.

- A. Adequate Funding:** The government should increase the funding of public universities in the country. More funds should be challenged to the development of science education.
- B. Employment of more Science Lecturers:** The government should give the school management to employ more science lecturer in the faculties and departments where there is needs of lecturers.
- C. Provision of Adequate Infrastructural Facilities:** The government should provide adequate infrastructural facilities in all the public universities across the country. Infrastructural facilities like this: Stable internet services, electricity, water supply, gas and modern laboratories, workshops, research apparatus should be ensured and provided.
- D. Increase the funding of Research programme in Science:** The university management should increase the research funding in all public universities and more funds should be allocated to science researches.
- E. Increase in the salaries of Lectures:** The government should increase the salaries of science lecturers. This will help to prevent brain-drain in the public universities.
- F. Implement Agreement Reached with Unions:** The government honour and implement all agreement reached with different unions in the universities to prevent strike actions in the public universities across the country.
- G. Fight Institutional Corruption:** The government and the various higher institutions management team should fight all the academic corruption and institutional corruption in the public universities across the country through the use of the anti-craft agencies.

Conclusion

In conclusion, this presentation discussed the challenges facing the teaching of science education in Nigerian public universities. Inadequate funding, inadequate science lecturers, shortage of infrastructural facilities, Brain-drain, poor research, strike action and corruption were identified as

challenges facing the teaching of science education in the Nigerian public universities. To address the challenges identified, the presenter recommended adequate funding of science programme in the public universities, employment of more science lecturers, provision of adequate infrastructural facilities, increasing the funding of research programme in sciences, increasing the salaries of academic staff to prevent brain-drain and to motivate the lecturers, implement agreement reached with the unions in the universities and corruption in the universities should be fought using the various anti-corruption agencies in the country were recommended as the ways forward for the development of science education in Nigeria public universities.

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