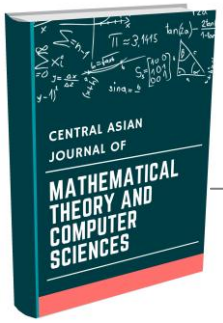

CENTRAL ASIAN JOURNAL OF MATHEMATICAL THEORY AND COMPUTER SCIENCES

http://centralasianstudies.org/index.php/CAJMTCS

02 Issue: 03 | March 2021 **ISSN: 2660-5309**

Administration of Mathematics Programme in Nigerian Higher Institutions: Issues, Challenges and Ways Forwards

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ABSTRACT

The article discussed the challenges facing the administration of mathematics programme in higher institutions in Nigeria. Secondary data was used to support the points raised in the article. The secondary data were sourced from print material and online publication by recognized institutions and individual author. There are many challenges facing the administration mathematics programme in Nigerian higher institutions. Some of the challenges include; inadequate funding, inadequate mathematics lecturers, inadequate infrastructural facilities, brain-drain and strike actions. To solve these challenges, this article recommends the following: government should increase the funding of mathematics programme in higher institutions, provide adequate infrastructural facilities, ensure stable academic programme, employment of more mathematic lecturers and motivation of lecturers to prevent brain-drain.

ARTICLE INFO

Article history:
Received 24 February 2021
Revised form 10 March 2021
Accepted 25 March 2021

Keywords:
Administration, Challenges, Mathematics Programme, Higher Education

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Introduction

Nigeria has a federal system of government with 36 states and the Federal Capital Territory of Abuja. Within the states, there are 774 local governments in total. The country is multilingual, and home to more than 250 different ethnic groups. The languages of the three largest groups, the Yoruba, the Ibo, and the Hausa, are the language of instruction in the earliest years of basic instruction; they are replaced by English in Grade 4.

Nigeria's education system encompasses three different sectors: basic education (nine years), post-basic/senior secondary education (three years), and tertiary education (four to six years, depending on the program of study). Education is administered by the federal, state and local governments. The Federal Ministry of Education is responsible for overall policy formation and ensuring quality control, but is primarily involved with tertiary education. School education is largely the

responsibility of state (secondary) and local (elementary) governments. According to Nigeria's latest National Policy on Education (2004), basic education covers nine years of formal (compulsory) schooling consisting of six years of elementary and three years of junior secondary education. Post-basic education includes three years of senior secondary education (WENR, 2017).

At the higher education level, the system consists of a university sector and a non-university sector. The latter is composed of polytechnics, monotechnics, and colleges of education. The tertiary sector as a whole offers opportunities for undergraduate, graduate, and vocational and technical education.

The National Policy on Education (FGN, 2004), defines Higher Education as the Post - Secondary Section of the National education system, which is given of Universities, Polytechnics and Colleges of Technology including courses as are given by the Colleges of Education, Advanced Teachers Training colleges, Correspondence Colleges and such Institutions as may be allied to them. Peretomode (2007) sees higher education as the facilitator, the bed rock, the power house and the driving force for the strong socio-economic, political, cultural, healthier and industrial development of a nation as higher education institutions are key mechanisms increasingly recognized as wealth and human capital producing industries. Bernett (1997) defines higher educational institutions as unique institutions which is differentiated from others in terms of research and its managers are designated as Provost, Rector, and Vice chancellor. Higher education is the education for the production of manpower and for aiding social, economic and technological development of a country.

The goals and objectives of higher education in Nigeria according to National policy on education (2004) include the following:

(a) the acquisition, development and inculcation of the proper value orientation for the survival of the individual and societies;

(b) the development of the intellectual capacities of individuals to understand and appreciate environment;

(c) the acquisition of both physical and intellectual skills which will enable individuals to develop into useful members of the community;

(d) the acquisition of an overview of the local and external environments (FGN, 2004)

The National Policy on Education (2004) again stated that higher educational institutions should pursue these goals through: Teaching, Research, the dissemination of existing and new information, the pursuit of service to the community; and by being a store- house knowledge.

The Nigerian higher education is the largest in Africa. Noun (2009) submitted that from a global perspective, economic and social developments are increasingly driving the advancement and application of knowledge. Education in general and higher education in particular, are fundamental to the construction of a knowledge economy and society in all nations. The nation looks up to higher education through its traditional functions of teaching, research and community service to develop manpower and disseminate necessary knowledge that are needed in industry and other sectors. The Nigeria higher education system comprised of universities, polytechnics, and colleges offering programmes in teacher education and agriculture. Higher education is a community of scholars, free to pursue knowledge without undue interference from anywhere.

Mathematics programme is one of the major programme offered in the Nigerian higher education. Programme offer in the Nigerian universities as listed in the National Universities commission BMAS documents were produced for the underlisted academic disciplines: i) Administration; Management and Management Technology; ii) Agriculture, Forestry, Fisheries and Home Economics; iii) Arts; iv) Basic Medical and Health Science v) Education; vi) Engineering and Technology; vii) Environmental Sciences; viii) Law; ix) Pharmaceutical Sciences x) Medicine and

Dentistry; xi) Science; xii) Social Sciences; xii) Veterinary Medicine.

Mathematics programme is grouped under the science programme. Mathematics programme in recent times in the Nigerian higher institutions is facing many challenges which ranges from poor supervision to poor administration. This article is aimed to discuss the challenges facing the administration of mathematics programme in the Nigerian higher institutions.

Concept of Mathematics Programme

Mathematics programme is a special programme. Mathematics programme is aprogramme that involved calculation. Mathematics is a programme that deal with humanity. Kyari, Obed & Yalwa (2018) agrees that Mathematics holds the mirror up to civilization. It is no exaggeration to say that the history of mathematics is the history of civilization. Mathematicians can take pride in the fact that their science, more than any other's is an exact science, and that hardly anything ever done in mathematics has proved to be useless.

Mathematics is the science of measurement, quantity and magnitude. It is also refers to as the abstract science which investigates deductively the conclusions implicit in the elementary conceptions of spatial and numerical relations. It is also defined as the science of number and space. Mathematics is also called science of logical reasoning. Locke had said "mathematics is a way to settle in the mind a habit of reasoning". Here the results are developed through a process of reasoning. The reasoning in mathematics is of peculiar kind and possesses a number of characteristics such as simplify, accuracy, certainty of result, originality and verification (Kyari Obed & Yalwa, 2018).

Emmanuel, & Daniel, (2017) submitted that there is no doubt that mathematics has extensive application in life and related fields. According to observation "mathematics is a gate-way to science". Mathematics is a language. It is the language without which science, commerce, industry the internet and the entire global economic infrastructure is struck dump. It is the only "truly" universal language, and it is an essential part of our personal and working life. Mathematics is not only a language and a subject, it is also critical in fostering logical, rigorous thinking, as such, its influence is immense. Everyone recognizes that it is vital to be able to read and write basic language (English). In mathematics, the equivalence of basic reading and writing is numeracy; numbers are the sound, syllables and word of the language of mathematics.

Emmanuel, & Daniel, (2017) opines that Mathematics is more than just the science of numbers taught by teachers in schools and either enjoyed or feared by many students. It played a significant role in the lives of individual, the world and society as a whole. Mathematics is an essential discipline recognized worldwide and it needs to be augmented in education to equip student with skills necessary for achieving higher education or career aspiration, and for attaining personal fulfillment. Since mathematics encompasses all aspects of human life it is unquestionably important in education to help students and all people from all walks of life to perform daily their tasks efficiently and become productive, well informed, functional, independent individuals and members of a society, where mathematics is the fundamental component. Mathematicians create so-called models of the world, and study them. This applies even to the simplest mathematics, after the age of five and six we do not study addition by actually combining groups of object and counting them. Instead we use an abstract mathematics contraction or model known as the positive integers i.e (the numbers 3, 4, 5, 6, and so on). Once again, Mathematicians study model so as to idealize world of intangible things that we do not come across in everyday life. For example, talking of a perfect circle, this does not concern tangible worldly thing like chairs, table and so on.

Concept of Educational Administration

Kalagbor (2017), defined the educational administration as the process of identifying,

mobilizing and utilizing scarce human and material resources relevant in education for the purpose of achieving specific educational goals efficiently and effectively. Gift (2018) sees educational Administration is concerned with integrating the appropriate human and material resources that are made available and made effective for achieving the purposes of a programme of an educational institution. Nwankwoala (2016), viewed the educational administration as a broad umbrella encompassing a number of processes such as: planning, coordinating, controlling and being involved in other management processes and contribute to formulation of policies. In order to achieve these goals, the head of the educational organization plans carefully various programmes and activities. The educational organization may be a school, college or university. The head organizes these programmes and activities with co-operation from other teachers, parents and students, motivating them and co- ordinating the efforts of staff members as well as directing and exercising control over them. The head evaluates the performance and progress of staff in achieving the purpose of the educational programme, provides feedback to them and brings modification in the plans and programmes of the institution when required. The totality of these processes which are directed towards realizing or achieving the purposes of the school is called educational administration.

According to Kalagbor (2017), the following activities and programmes come under the scope of educational administration at the institutional level: (a) Deciding the purposes of the institution or school,(b) Planning for academic or curricular and cocurricular activities,(c) Preparing the time table and the time schedules for various activities,(d) Assigning duties and responsibilities to the staff members,(e) Organizing curricular and co-curricular programmes, (f) Directing and motivating the staff of the institution, (g) Coordinating by efforts of people to achieve the purpose. h. Exercising control over the staff,(i) Conducting periodical reviews about the progress, achievements and failures of the institution,(j) Taking measures for staff development,(k) Maintaining order and discipline,(l) Management of materials(m) Management of finance(n) Maintaining records and registers up to date, (o)Maintaining human relationships,(p) Supervision of the work of teachers and other employees(q) Giving feedback to the teachers performing well and taking remedial measures for teachers not performing well.

Mathematics programme administration is the systematic ways of arranging science resource to implement science programme with the objectives of actualizing the objective of science programme in the educational institutions.

Challenges facing the Administration of Mathematics Programme

There are many challenges facing the administration of mathematic programme in Nigerian higher institutions. Some of the challenges include; inadequate funding, inadequate lecturers, inadequate infrastructural facilities, brain-drain and strike actions.

Inadequate Funding of Mathematics Programme

Inadequate funding is one of the major problem facing the administration of mathematics programme in the Nigerian higher institutions. Annual budgetary allocation for the administration and management of mathematics programme is not adequate. The administration of mathematics programme is very cost intensive. So, more funds are needed to effectively implement mathematics 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. 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. All these challenges notwithstanding, mathematics

education has a lot of potentials and prospects to offer to our teeming youths. Okoli, Ogbondah & Ewor,(2016) submitted that one of the major challenges facing the management of this sector of education is inadequate funding. The budgetary allocation devoted to education has been considered to be grossly inadequate considering the phenomenon increase in students' enrolment and increasing cost, which have been aggravated by inflation. A serious problem confronting Nigerian public university education today is that of scarcity of fund. Government financial policies on education have therefore been subjected to constant review with the intention of allocating more resources to university education. Udida, Bassey, Udofia, & Egbona, (2009) observed that the major issue in educational development is shortage of funds. One of the most serious problems threatening the survival of the educational systems is that of dwindling level of public funding in the face of rising demands and hence rising cost of higher education. This shortage of funds affects job performance and the growth of the institution. Higher educational institutions cannot perform optimally without funding. This situation calls for increased fund initiative from both the government and educational stakeholders so as to sustain the tempo and growth of education industry. The inability of the Nigerian government to objectively accept and implement the 26% funding formula for education recommended by the UNESCO impact negatively on the performance and sustainability of higher education. Many institutions of higher learning in Nigeria were unable to build lecture halls, students' hostels, equip laboratories and workshops and payment of staff salaries, research grants, allowances and medical bills (Romina ,2013, Ivara and Mbanefo cited in Asiyai 2005)

Inadequate Lecturers

Another problem facing the administration of mathematics programme in the Nigerian higher institutions is the challenge of inadequate mathematics lecturers. In the tertiary level, the subsector of colleges of education experiences a very acute teaching staff shortage in disciplines such as special education and early childhood development, while the polytechnic subsector reported a very acute shortage of teaching staff in health technology. 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). Shortage of qualified teachers in Nigerian universities is also well articulated in the reports of the Federal Government's needs assessment of Nigerian public universities carried out in 2012. According to the reports, only about 43 per cent of university lecturers have PhD qualifications. The remaining 57 per cent have qualifications below PhD. Only seven universities have up to 60 per cent of their teaching staff with PhD qualifications. There are universities with fewer than five professors. For instance, the Kano State University of Science and Technology, Wudil, established 11 years ago and has been turning out graduates, has only one teaching staff with a professor ranking and 25 lecturers who are PhD degree holders. Similarly, the Kebbi State University of Science and Technology, established in 2006, has only two teaching staff in the professor category and five lecturers who have PhD qualifications. The understaffing of universities in Nigeria has serious implications for quality instruction and academic productivity in the institutions. The situation has led to an increasing culture of visiting lecturership in the system. The few available qualified lecturers are recycled as visiting, adjunct, sabbatical and contract lecturers to work in many universities at the same time. Many of them are always on the road travelling from one university town to another and unable to meet their

primary obligations with their tenure-employer (Federal Ministry of Education, 2012).

Inadequate Infrastructural Facilities

Infrastructural facilities are very important in the administration of mathematics programme. Infrastructural facilities are social capital that every higher institutions must have in adequate to be able to implement the mathematics 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. Ochuba, (2001) observed that it is worrisome to note that Nigerian universities are fast decaying. All the resources required for education production process are in short supply. Lecture halls, laboratories, students' hostels, library space, books and journals and office spaces are all seriously inadequate. Moja (2000) submitted that the existing buildings are in a state of decay due to lack of maintenance and repair. The present conditions of buildings impact negatively on the quality of education offered. Such conditions have encouraged a brain drain of teaching and administrative personnel out of education to other sectors of the economy or out of the country. Dilapidated school environments contribute to the high dropout of learners from school. The amount of funding needed for new buildings is high and the estimated cost of the rehabilitation of the existing infrastructure is even higher. 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. They also include roads, electricity and water supplies (Noun,2012 cited UNESCO, 2006). According to Noun,(2012) some infrastructural facilities include:

Lecture Rooms: A classroom or lecture room is referred to as a geographical space that has furniture (that is, table and chairs) where a class of students are taught. For the sake of effective teaching and learning process, there is need for well ventilated classrooms.

Laboratories: Practical-oriented courses demand the use of laboratory. Disciplines like Chemistry, Physics, Microbiology, and so on, require the use of well-equipped laboratories. Apparatuses and chemicals meant for practical have to be made available because a laboratory without the expected apparatus amounts to no laboratory.

Workshops: Courses such as Electrical Electronics, Mechanical Engineering, Wood Work, and Metal Work involve hands-on (practical) experience. Thus, universities, polytechnics and colleges of education offering these courses need functional workshops where theoretical aspects that are taught are complemented with practical.

Office Accommodation: Lecturers, instructors and non-academic staff have to be accommodated in offices. The offices have to contain essential tools that will make them function properly. A functional computer system is one of the tools required by academic staff to deliver quality instruction. They is the need for them to have access to Internet facilities. They require printers, scanners and other stationery in their offices.

Functional Library: Webster's (concise edition) Dictionary and Thesaurus (2002) view library as a collection of books, tapes, records, photographs, etc for reference or borrowing, a room, building or institution containing such a collection. Infrastructural facilities support the administration and management of science programme. Their availability aid the realization of educational objectives and their inadequacy affects the implementation of teaching, learning, researching and delivering of other education services. It have been observed that inadequate infrastructural facilities is one of the problem facing the entire educational system in Nigeria. The infrastructure and facilities remain inadequate for coping with a system that is growing at a rapid pace. The working environment is therefore generally not conducive for delivering of services

due to the physical condition of most offices and lack of working resources (Noun,2012).

Brain-Drain

Brain-drain is one of the major factor responsible for ineffective administration of mathematics programme in many Nigerian higher institutions. 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 oversea 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. Smah (2007) submitted that Professor Joseph Stilglitz, 2001 Nobel Prize winner in Economics, who, while delivering a lecture at the first Dr. Pius Okadigbo memorial lecture series in Enugu said that there is a particular university in the U.S. that has over 25 Nigerian professors. He submitted that the above pointer is instructive for any serious-minded government that wants to address the issue of brain-drain. Odetunde (2004) submitted that, there was mass exodus of many brilliant lecturers to the business world and others left Nigeria for better services.

Strike Actions

Strike action by different union groups in the Nigerian higher institutions is another problem preventing smooth administration of mathematics programme across the Nigerian higher institutions. Romina (2013) submitted that a big challenge to quality higher education in Nigeria is the incessant staff union disputes and subsequent closures of the institutions. Closure of the institutions affects staff productivity and the realization of educational aim and objectives. Okoli, Ogbondah & Ewor,(2016) also observed that it has become a known fact that students across various universities in Nigeria are constantly faced with industrial actions embarked upon by the Academic and Non-Academic Staff Unions of various institutions. The disagreement or lack of understanding between government and unions arising from non-implementation of agreement reached, often results in deadlock that usually disrupts academic calendar. As academic activities are suspended for a long period, the students reading abilities fell. Even the previous knowledge acquired is even forgotten by some students. This mostly turns some students into certificates seekers than knowledge seekers. Romina (2013) cited Asiyai (2005) who provided a catalogue of strikes by the Academic Staff Union of Universities (ASUU) and the Senior Staff Association of Nigerian Universities (SSANU) within fourteen years. She revealed that they were too many strikes, some of which lasted up to six months. Romina ,(2013) cited Asiyai (2006) that identified the variables inducing the frequent trade union disputes as poor conditions of service of staff, non implementation of ASUU/FGN or SSANU/FGN agreements, lack of autonomy and academic freedom and poor funding. The universities in Nigeria are presently closed down since July 2 2013 as a result of failure of the federal government to implement the agreement reached with the academic staff union of universities since 2009, despite all assurances and memorandum of understanding between the two parties. The disruption of academic programmes of institutions of higher learning affects students learning outcomes, since lecturers find it difficult to complete the course work. The frequent disputes and strike galore by university staff and students leave students with little or no time to complete both their theoretical and practical work. In most cases a semester's course work is sandwiched to few weeks during which lectures are rushed to accommodate the time lost to strike. This type of

academic rush is a big threat to attainment of quality in higher education in Nigeria (Romina,2013). Mathematics programme needs a stable and conducive environment for effective administration to take place.

Ways Forward

The following were put forward as solutions to the problems: government should increase the funding of mathematic programme in higher institutions, provide adequate infrastructural facilities, employment of more science professional lecturers and motivation of lecturers to prevent brain-drain.

Adequate Funding of mathematics Programme

For effective administration of mathematics programme in the Nigerian higher institutions to possible, the government should increase the funding of science programme. Romina (2013) recommended that the government of Nigeria should place high premium on education by meeting up the recommended 26% educational spending prescribed by UNESCO, to help revitalize the higher education system. Enabling environment should be created for staff through improved conditions of service, provision of basic infrastructures, virtual libraries and information communication technologies and internet connectivity. Institutions of higher learning in Nigeria should set up internal quality assurance and monitoring of lecture units to enhance good quality delivery.

Adequate Infrastructural Facilities

More infrastructural facilities like modern laboratories for physics, chemistry, Biology and computers etc should be provided. If quality is to be enhanced in our nation's universities, the infrastructural base of the system needs to be improved upon. The government should make available enough funds for the rehabilitation of existing facilities. Government should intensify efforts in providing more physical facilities. Corporate bodies, philanthropists and alumni associations should assist in the provision of these facilities to aid effective teaching learning activities. There is need for a serious expansion of physical facilities and equipment to meet the increasing student population. There is need to take serious look at the maintenance culture, which is lacking in Nigeria, as this will go a long way to reduce the rate of decay of the existing facilities (Noun,2011).

Employment of more Academic Staff

The government should direct school administrators to employ more mathematics lecturers in all the higher institutions in the country.

Motivation of Lecturers

To prevent brain-drain among the Nigerian academic staff, the government should increase the salaries of lecturers, provide conductive teaching environment and improve on their welfares packages. Romina (2013) observed that to improve quality, lecturers and non lecturers should be motivated to make them more dedicated, devoted and committed and effective in their jobs. Institutions of higher learning in Nigeria should employ more lecturers to match the students' population. Institutional policies should be revised to ensure that more emphasis is paid on teaching effectiveness of lecturers for better quality education.

Stable Academic Calendar

Maintaining stable academic calendar is very important for the realization of mathematics programme in all educational institutions. It promote the image of the educational institutions and help to reduce educational wastage in the system. The government and school administrators should always ensure that agreement reached with different unions groups within the educational institutions are well implemented as agreed to avoid strike actions in the educational institutions.

Conclusion

Mathematics programme is one of the programmes Nigerian higher institutions are offering. There are many challenges facing the administration mathematics programme in Nigerian higher institutions. Some of the challenges include; inadequate funding, inadequate professional teachers, inadequate infrastructural facilities, brain-drain and strike actions. To solve these challenges, this article recommends the following: government should increase the funding of mathematics programme in higher institutions, provide adequate infrastructural facilities, ensure stable academic programme employment of more science professional lecturers and motivation of lecturers to prevent brain-drain.

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