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# Adequate Funding Panacea for Development of Science Education Programme in Nigeria Educational Institutions

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***Abstract*:** *Adequate funding plays a pivotal role in the advancement of science education within Nigerian educational institutions. This article examines the significance of funding science programs in schools across the country and its impact on effective implementation. Utilizing secondary data from online literatures and print publications, the study explores the multifaceted benefits of sufficient financial support. The findings reveal that proper funding of science programs results in numerous advantages. Firstly, it ensures the availability of necessary funds for successful execution. Secondly, it facilitates the development of vital infrastructural facilities like well-equipped laboratories and libraries, fostering an optimal learning environment. Furthermore, adequate funding enables the employment of qualified and professional science teachers, thereby maintaining the quality of education in science-related subjects. Additionally, it enables the provision of science instructional materials, promoting active student engagement. Moreover, funding facilitates effective staff training for science teachers, preventing brain-drain and encouraging them to contribute to science education in Nigeria. Lastly, it serves as a motivational factor for science teachers, empowering them to excel in their roles. Based on these crucial points, the article emphasizes the significance of adequate funding for science education in Nigeria, promoting sustainable development within the nation's schools. Recognizing the importance of funding science programs can better prepare students for a future reliant on scientific knowledge and innovation. Policymakers and stakeholders are urged to prioritize and invest in science education to secure a prosperous and progressive future for Nigeria.*

***Key words:*** *Adequate funding, Science Programme, Science Education, Instructional Materials, Professional Development.*

## INTRODUCTION

Funding of science programme in Nigeria is poor and has affected the implementation of science programme in the educational institutions across the country. Science education is a fundamental component of a nation's progress and development, serving as a catalyst for advancements in various fields. However, the state of science education in many educational institutions is often hindered by financial constraints. Ajemba, Ahmed, Ogunode and Olatunde-Aiyedun (2021) highlighted the pressing issue of inadequate funding, which significantly impacts the growth and quality of science education.

At the secondary schools, Abubakar, Ogunseye and Ogunode, (2021) noted that shortage of funding is a major problem hindering the development of science programme. Also, Ajemba, et al. (2021) noted that underfunding of science education is a very big problem facing the administration of science programme in Nigerian educational institutions. Olatunde-Aiyedun and Ogunode (2021) further noted that funds released for the implementation of science programme in public secondary schools are not adequate to implement the programme.

At the tertiary education, Ogunode & Aiyedun (2020) noted that poor funding is a challenge to the teaching and learning of science education in the Nigerian tertiary institutions. Annual budgetary allocation for the administration and management of science programme is not adequate. Also, Izunna Somadina Okwelogu, Ogunode and Abayomi (2021), stated that inadequate funding is a major problem facing the science education in Nigerian public universities.

Studies by Ogunode, Attah, & Ebute (2023) and Ogunode, Onyekachi, & Ayoko, (2023) revealed that one decade funding of educational sector in Nigeria which is below the UNESCO recommendation of 15% to 20% of annual national budget. The table below indicated the figures.

**Table 1. Nigerian Budgetary allocation to Education.**

| Nigeria Education Spending - Historical Data | | |
|---|---|---|
| **Year** | **Education Spending (% of GDP)** | **Annual Change** |
| **2021** | 5.14% | 0.01% |
| **2020** | 5.13% | -0.72% |
| **2019** | 5.86% | -0.09% |
| **2018** | 5.94% | -0.18% |
| **2017** | 6.12% | -0.53% |
| **2016** | 6.65% | -2.60% |
| **2015** | 9.26% | 0.22% |
| **2014** | 9.04% | 0.36% |
| **2013** | 8.68% | 0.13% |
| **2012** | 8.55% | 0.67% |
| **2011** | 7.88% | 1.71% |
| **2010** | 6.17% | 1.71% |

Source: https://www.macrotrends.net/countries/NGA/nigeria/education-spending/

Ogunode, Attah, & Ebute (2023).

Generally, Emeka & Ogunode (2021), acknowledged that inadequate funding is a major problem responsible for poor development of science education. Science education is very expensive and cost effective. Ezechi and Ogbu, (2017) posited that funding science programmes and science related research has been a major problem facing technological growth and self-reliance in Nigeria. Government do not adequately fund science and science related programmes and research. In addition to this, the little fund provided relapse and are embezzled by top officials in charge of its implementation.

**Concept of Science Education**

The science programs include Mathematics, Physics, Chemistry, Biology, Further Mathematics, Technology, Environmental Science, and Technical Drawing. Olatunde-Aiyedun and Adams (2022) noted that blending science learning with science programs in Nigerian schools are given maximum attention due to their significant contribution to the technological development of the country. Adolphus (2019) asserted that in Nigeria, science is taught and learnt as Basic Science and Technology from primary to junior secondary levels, and as biology, chemistry and physics for three years in the senior secondary (SS) classes (SS1-3). The government recognizes the importance of science to the development of its young citizenry as demonstrated in the national policy and other curricula texts, "in recognition of the fundamental importance and cost-intensive nature of science, technology and trade/entrepreneurship, Government shall provide adequate funds for science, technology and trade/entrepreneurship education" (FRN 2013).

Science programme is defined according to Ogunode and Aiyedun (2020) as programmes that are mathematical oriented. Science programme is also viewed as programme that are involved in practicals. Science programme is the programme that is very important to the social economic and technological development of a nation. The place of science programmes in the development of the social. Economic and technological development cannot be underestimate. Science education deals with sharing of science concepts and procedure with people who are not considered customarily to be individual from the empirical researchers; the people could be students, ranchers, advertiser, sales women or an entire network. Science education in Nigeria focuses on the teaching of science concepts, technique for teaching and tending to misconceptions held by learners with respect to science contents (**Ojelade, Aregbesola, Ekele & Aiyedun, 2020).** Science education is essential to the development of any nation that is the reason each nation must take it intense at all levels of learning. A significant number of the civilized world had the option to accomplish such a great amount in science and technology on account of science education (Kola, 2013; Orji, Ogar & Aiyedun, 2018).

Ogunode and Jegede (2019) and Adolphus, (2019) submitted that the purposes of science education in Nigeria are generally drawn from the national goals and philosophy of education as contained in the National Policy on Education (NPE). For instance, the goals of education in Nigeria include the Development of the individual into a morally sound, patriotic, and effective citizen; …and social abilities and competencies as equipment for the individual to live in and contribute to the development of society (FRN 2013). According to the National Policy text, the goals of science education shall be to: i Cultivate inquiring, knowing and rational mind for the conduct of a good life and democracy ii Produce scientist for national development, iii Service studies in technology and the cause of technological development; and iv Provide knowledge and understanding of the complexity of the physical world, the forms, and the conduct of life (Adolphus, 2019) cited (FRN 2004, 29).

**Importance of Funding of Science Education**

Adequate funding of science education in Nigerian educational institutions will lead to; availability of funds, infrastructural facilities (laboratories and libraries), employment of adequate science teachers, provision of instructional materials, effective staff training, prevention of brain-drain and motivation of science teachers.

**Availability of funds**

Adequate funding of science programme will make it possible for availability of sufficient funds for the management and administration of science propgramme at the schools level. Abubakar, Ogunseye, & Ogunode, (2021) observed that suggested to the government to increase the funding of science programme school education and this increment will lead to employment of more science teachers should be employed and deploy to public secondary schools where their services are needed. Olatunde-Aiyedun, Olamoyegun and Ogunode (2022) noted that investment in science education will aid delivery of quality education and prpocurement og human and materials resources for the implementation of science programme in Nigerian schools.

**Infrastructural Facilities (laboratories and libraries)**

Adequate investment in educational sector and in science education will guarantee development of infrastructure facilities in schools that will aid smooth implementation of science programme. Ogunode (2020); and Ogunode and Agwor (2021) defined infrastructural facilities as those facilities aiding delivery of academic and non-academic services in educational institutions. Infrastructural facilities include; libraries, laboratories, halls, offices, administrative blocks, hostels, roads facilities, water, electricity, and internet. The availability of adequate infrastructural facilities plays a pivotal role in ensuring the effective administration of educational institutions, while their inadequacy can hinder the institution's overall functionality (Ogunode, Jegede, Olamoyegun, Akinjobi, & Olatunde-Aiyedun, 2022). Specifically, for a successful mathematics program, the presence of mathematics laboratories and mathematics libraries is of paramount importance. These facilities are indispensable for the seamless execution of mathematics programs in schools.

Practical-oriented courses, such as Chemistry, Physics, Microbiology, and others, necessitate the utilization of well-equipped laboratories (Ogunode & Aiyedun, 2020). Without access to the appropriate apparatuses and chemicals, laboratories lose their purpose and efficacy. Unfortunately, many schools in Nigeria lack adequate mathematics laboratories and mathematics libraries due to financial constraints, as observed by Ogunode and Onize (2022), Ogunode and Murtala (2022), Olatunde-Aiyedun and Ogunode (2021a), and Ebehikhalu & Dawam (2017).

The root cause of this shortage lies in insufficient funding for science programs in Nigeria. To overcome this challenge and ensure access to essential facilities, it is imperative to allocate adequate funding to support the science program in educational institutions. By doing so, we can address the scarcity of mathematics laboratories and libraries, paving the way for a more robust and effective mathematics education across the country.

**Employment of Adequate Science Teachers**

Adequate funding of educational institutions and in particularly science programme will aid employment of qualified science teachers in all educational institutions. Science teachers are crucial for the implementation of science programme in schools. Ezechi and Ogbu (2017), states that the success of science programmes depends largely on the classroom teachers. They constitute the most important agent in the ongoing exercise to revolutionize the teaching and leaning of science. Science

teachers are key to successful implementation of science programme. Ezechi, & Ogbu (2017) observed that teachers are the pivot on which educational process hang. They can influence the teaching/learning outcomes either positively or negatively because they determine the quality of instructional delivery and also influence the quality of Education when it comes to implementation of the curriculum and educational policies. Teachers are to be considered when addressing issues such as quality assurance, qualitative delivery (teaching), quality context and quality learning outcomes (Ezechi & Ogbu, 2017; Onucha, 2002). Investment in science education will help to employ more science teachers in all educational institutions across the country.

**Provision of Science Instructional Materials**

Proper investment in science education will lead to provision of adequate science instructional resources in the various educational institutions in Nigeria. Science instructional resources are resources used by the science teachers to make teaching and learning of science programme simple and easy to understand. Ogunode and Josiah (2023) observed that instructional materials are educational resources assembled by the teachers to implement teaching programmes in the classroom. Instructional materials are special educational resources that aid the teachers to deliver the lesson. Instructional materials are used in all forms of educational institutions. The resources are influencing the implementation of teaching, research and community service in the various tertiary institutions. Ogunode, Iyabode, and Olatunde-Aiyedun (2022) emphasized that instructional materials can be utilized to effectively implement certain community service programs. For instance, in community health programs, instructional materials such as brochures, posters, and audiovisual aids can be employed to disseminate essential information on hygiene practices, disease prevention, and healthy living habits to the local population. These materials serve as valuable educational resources, promoting awareness and encouraging positive behavioral changes within the community.

Teachers in educational institutions teach well with the deployment of instructional materials. Instructional materials serve as a channel between the teacher and the students in delivering instructions. They may also serve as the motivation for the teaching-learning process. It is used to get the attention of the students and eliminate boredom. Oladejo, Olosunde, Ojebisi & Isola (2011) and Ogunode (2020) agreed that adequate funding of science programme in Nigeria will ensure full provision of the science instructional resources to all educational institutions in right proportion.

**Effective Staff Training**

Training of science teachers in educational institutions is very expensive. It is only through adequate funding of education can objective of human capital development can be achieve in the schools. Ogunode, Kasimu & Sambo, (2023) defined training as a formal process of acquiring skills and technical know-how in a specific field so as to enhance competency and expertise in the use and manipulation of modern technology and in handling technical issues in all human endeavours. Training has been conceived to be a process of acquiring skills towards improved performance. Increase in workers output and efficiency are among reasons advanced for training needs of the workers. According to Álvarez and Olatunde-Aiyedun (2023), training is a purposeful and systematic initiative intended to enhance individual skills in a particular task. It serves as an organized program aimed at elevating employee performance levels. Staff training is meticulously designed to provide employees with the essential knowledge and skills necessary for carrying out their job responsibilities effectively and to foster continuous improvement in their performance. Science teachers need training and retraining programme always to keep them abreast and updated about development in their various programme. Shortage of funds is a major problem that has affected training programme in the Nigerian

educational institution. Funds released for the implementation of staff training programme by the government through their agency to the various institutions is not adequate and this have affected the training programme implementation. Ogunode, & Jegede, (2020); Ogunode, (2020); Orji, Ogar & Aiyedun (2018) and Osuolale (2014).); recommended adequate funding of education as the only solution to the problems of poor training in the educational institutions in Nigeria.

**Prevention of Brain-drain**

One of the major problems facing implementation of science programme in the Nigerian educational institutions is brain-drain. Ogunode, Ezema & Olugbenga (2022); and Ogunode and Aiyedun (2020) submitted that Brain-drain is one of the major factor responsible for ineffective administration of science programme in many Nigerian higher institutions. Many academic staff that are supposed to be lecturing and mentoring the students here in Nigeria are leaving every day to abroad for a better job. Ogunode and Atobauka, (2021); and Ogunode & Musa (2021) views Brain-drain as the mass movement of professionals from the developing countries to developed countries for better working conditions. Nigerian universities are facing the problem of brain drain because of poor motivation and poor working environment. Many science teachers and research have gone out of the Nigerian schools to other countries like South Africa and European countries. Few among many factors responsible for the best brain of Nigerian lecturers going abroad are poor condition of service, strike actions, poor research, poor motivation, insecurity challenge and poor funding of education. Adequate investment in education and science programme will help to tackle the problem of brain-drain in the education system in Nigeria according to (Okwelogu, Ndayebom & Ogunode, 2023; Ndayebom, & Olamoyegun, 2022).

**Motivation of Science Teachers**

Adequate funding of science programme in school will help to implement motivational packages for science teachers that will motivate them to perform their job well. Ogunode, Kasimu and Ibrahim (2023) viewed motivation as perceived as an invisible force that compel and inspire individuals towards one direction or action for greater productivity. Motivation is the force that propelled an individual to carry out specific functions without complain. Also, Josiah, Audu, and Ogunode (2023) defined motivation as that forces that influence an individual to give his or her best in an institutions and in the realization of goals. Motivation is the drive that influences an individual to achieve the maximum output for himself or an institutions. Insufficient funding in Nigerian educational institutions has been recognized as a significant obstacle to the successful implementation of motivation programs and packages in schools. Adequate financial support is essential for effectively executing motivational initiatives and cultivating a positive attitude among students within the educational system (Olatunde-Aiyedun, 2021). With limited funds, schools may struggle to provide the necessary resources and incentives that contribute to student motivation. Motivational programs, such as awards, scholarships, extracurricular activities, and recognition ceremonies, require financial investment to be fully functional and impactful. Unfortunately, when funds are lacking, the implementation of these initiatives may be compromised, leading to reduced participation and enthusiasm among students.

Adequate funding enables schools to offer conducive learning environments that promote positive attitudes among students. (Olatunde-Aiyedun, Eyiolorunse-Aiyedun and Ogunode (2021) noted that well-equipped digital classrooms, libraries, and other facilities positively influence the overall learning experience, fostering an atmosphere of motivation and eagerness to excel academically. Adequate investment in science programme in the schools will help to increase science teachers' salaries, implement promotion allowances and send them for training. Omorogbe, & Ewansiha, (2013)

submitted that teacher salary is very important as a predictor of students achievement because it has the capacity to uplift the other aspects of teacher quality. If a teacher gets a suitable salary that covers the basic living costs, he may be able to live comfortably and thus be more effective as he is motivated to use his abilities, competencies and skills.

**Conclusion and Recommendations**

In conclusion, this paper highlights the crucial role of adequate funding in driving the development of science education within Nigerian educational institutions. Insufficient financial support poses significant challenges to the effective implementation of science programs across the country. By examining the various aspects influenced by funding, the study underscores the immense benefits that come with investing in science education.

1. **Increase Budget Allocation to Education:** The government should prioritize education by improving the percentage of the annual budget allocated to the sector. Following the UNESCO recommendation of allocating 15% - 20% of the entire budget to education will provide the necessary financial foundation for enhancing science education.
2. **Invest More in Science Education:** A greater focus on investing in science education is essential to equip educational institutions with the required resources and facilities. By allocating sufficient funds, schools can develop well-equipped laboratories and libraries, which are crucial for fostering a conducive learning environment.
3. **Support Professional Development for Science Teachers:** Adequate funding should be directed towards the employment and continuous training of professional science teachers. This will ensure that schools have skilled educators capable of delivering quality science education.
4. **Provide Science Instructional Materials:** Allocating funds for the procurement of science instructional materials is vital for engaging students effectively with scientific concepts and promoting hands-on learning experiences.
5. **Prevent Brain-Drain:** Adequate funding can help retain skilled science educators within Nigeria, preventing the loss of talent to other countries and promoting a stable and skilled teaching

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