ACADEMIC LIBRARIES AND THE ADVANCEMENT OF SCIENCE AND TECHNOLOGY EDUCATION IN NIGERIA FOR NATIONAL DEVELOPMENT

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Abstract.
This study examines the academic library and the advancement of science and technology education in Nigeria for national development. It identifies that the academic library is of great relevant. The paper provides with the assumption that science and technology education cannot effectively realize its objective of advancing the society scientifically and technically without the supportive role of academic library. The paper is purely theoretical in design, enumerates the roles of the academic library in the advancement of science and technical education and how important science and technology education have become that even politics has become so scientific that its actors have become scientifically technical in politicking. Use of oral media, information packaging and extension services are some of the methods that could be used to disseminate science and technology education materials in academic libraries. Subsequently, some of the recommendations made include adequate funding for academic libraries by government for the acquisition of science and technology information resources and alternative sources of funding by academic libraries such as NGOs, Philanthropies etc which will help in the acquisition and advancement of science and technical education in Nigeria.

Keywords: Academic libraries, advancement, science development, technical education, Nigeria.

Introduction

Nigeria is the most populous country in Africa that is geographically and well located on the West Africa Coast. It has a great diversity in the area of its natural components that comprise of varied topography, climatic conditions as well as gestational pattern. With a population of over 150 million people, Nigeria is the largest country in African and accounts for 47 percent of West African's population (World Bank, 2010).Historically speaking, libraries are key components of society's epistemic infrastructure. They are institutions of learning that strive to meet the information and knowledge needs of users. Paterson (1999) stressed that libraries are investment in humanity, in its progress, its struggles and its traditions. Libraries have been described as complex institutions with multiple roles and a host of related operations and services that have developed over the years. Yet their fundamental purpose has remained the same; to provide access to trustworthy, authoritative knowledge (cf. Uhegbu, Nwokocha and Unagha, 2012, citing Campbell, 2006).

This is in line with the popular opinion that; education is a companion which no misfortune can depress; no crime can destroy; no enemy can alienate; no despotism can enclave. Without it, what is man? Our society is in transition, in which old ways are continuously yielding place to new one. The new world in which we are today has given birth to science and technology. Education is an instrument used for anything. It is anything employed for doing one's job or arriving at an objective or achieving a goal. It is a process or an agent employed to reach a goal; it is a device to which one has recourse to realize a purpose(cf. Adamu et al., 2006, citing Adamu, 1996).

Economic survival and national stability most probably emanate from business and technical education (cf. Kutz, 2001). The National Policy on Education defines technical and business education as 'that aspect of education which leads to the acquisition of practical and applied skills as well as basic scientific knowledge'. The traditional societies that inhabited the territory now known as Nigeria must have experienced one form of technical education or another. Even during the pre-historic times and the time long before those societies came into any form of contact with western influence, it is doubtful that any societies could have survived the harsh realities of life and the environment of those times and lived on to the present times without the development of skills and expertise in the creation of tools and gadgets required for the provision of basic needs especially food, security, shelter, health care and communication.

Academic Library

The history of academic library development in Nigeria dates back to pre-independence time when the University of Ibadan and its library were established in 1948. As pointed out by Aguolu(1996) since independence in 1960, there has been an unrelenting upsurge in the establishment of educational institutions at all levels, especially university education. Nigeria has a number of Universities, Polytechnics and Colleges of Education attached with academic libraries. Nigerian university system is been supervised by the national university commission (NUC) a parastatalbody under the federal ministry of Education (FME); while the National Board for Technical Education and National commission for colleges of Education (NCCE) supervises polytechnics and colleges respectively.

The term academic library has received many definitions by experts, writers, academics and practitioners in the field of librarianship.Onwubiko and Uzoigwe (2004) citing Ahanene (1994) defines academic libraries as libraries located in academic institutions, which provide support to academic programmes and curricula of the institutions. Attama and Ezema (2015) posit that academic libraries provide enabling reading environment for recreation in a useful variety of location as well plan for the security of the information resources in the library. Academic libraries are libraries attached to tertiary institutions such as universities, polytechnics, colleges of education, college of agriculture and college of technology (cf. Akporhonor, 2005).Singh and Kaur (2009) stressed that preservation and access knowledge and information is the main mandate of academic libraries alongside supporting the mission of their parent institution which is teaching and research.

Academic libraries are therefore at the fore front of providing information service to their respective communities which comprises students, lecturers and researchers in order to support their teaching, learning and research need. Scholars have emphasized on the critical role of academic library in research and scholarship in institutions of higher learning. Many a time's academic libraries are referred to as the heart or nerve centres of institutions of higher learning where all academic activities resolved (cf. Abubakar, 2011). Olarongbe, Nwokocha and Igwe (2015) maintained that for these academic libraries to meet up with the expectations and demands of their users, cardinal resources such as financial, infrastructural, information/knowledge and human resources are expected to be in place.

Paradigm shift in academic library services with the advent of information and communication technology (ICTs) the role and position of libraries has dramatically changed. Okon(2005) citing Etim(2004), observes that the rapid pace of development in the field of information technology and the advent of networked information services have promoted a comprehensive review of the library and information science (LIS) profession. The global trend is now characterized with a fundamental shift from traditional information environment to an e-environment where emphasis is placed more on the acquisition of e-resources such as e-books, e-journals as well as online databases. However traditional library and information services and functions are still relevant(cf. Kumar, 2009).

The phenomenon of globalization and other related expectations of the 21st century such as Millennium Development Goals (MDG), World Declaration on Higher Education, the Association of African Universities (AAU), Declaration on the African Universities in the third millennium, the internationalization of higher education in Africa etc. have brought about unprecedented changes in the way and manner libraries and information service outfits conduct the business of connecting people to information. The three dynamic forces impelling the social changes which cut across all facets of our society today-including demographic, technological, and economic have brought about trends and paradigm shifts in libraries and information science contents and delivery mechanism (cf. Nwosu, 2012). Kumar (2009) notes that academic library are changing dramatically by adopting new means of technology in all activities and from print to e-environment where a variety of manual method, are replaced by computerized system which provides opportunity for online accessibility. Libraries are now expected to provide to users a

range of ICT necessary for retrieving information quickly from both immediate and remote databases, as well as creating a need for library co-operation and consortium initiatives (cf. Okiy, 2005).

Apparently academic library services are focusing more on the area of digital, virtual or libraries without borders all of which have transformed academic library environment. The transition and the transformation are accompanied with sophistication in the changing pattern in the information needs of users which is growing rapidly. Singh and Kaur (2009) observe that there is a paradigm shift from stand alone libraries to library and information networks, from printed publication to digital documents, and from ownership to access. The transition according to them is as a result of the impact of ICTS, the internet and the web which is affecting all types of libraries. Development in the ICT have now offered academic libraries an exciting and challenging opportunities that requires them to respond positive in all facets of their services and functions if they are to remain relevant in the 21stcentury. Thus, devising means of survival becomes very imperative.

Science and Technical Education: Conceptual Analyses
The fundamental purpose of science is the accumulation and classification of experience and the systematization of such experience into a relatively small number of broad general laws and principles governing the specific categories into which phenomena can be classified. In the early stages of science, the task is to gather define, and catalogue experiences in order to obtain an understanding of their inter-relationships. In the later stages of science, the task is to reduce to a minimum the number of laws necessary to express those relationships. (cf. Osuala, 2007). Science is seen as a tool for improving the economic

development of a nation, and viewed as a process whose objective is to achieve a goal. The process is a transformational one which aims at every aspect of man's and nation personality as a whole with a view to modifying, changing, developing, re-orientating its form of original crude or natural state through exposure and assimilation of knowledge, tested experiences and new information acquired formally or informally (cf. Adamu et al, 2006).

Science education is one of the areas in the wider world which shaped and molded the character of the 21 century especially in technologies, which have revolutionized the way we live and think. Our world is a world of profound changes, new forces have been unleashed which have transformed the relationship between societies, states and communities and even between individual. Education raises man from the state of an animal and allows him to enjoy full blessings of a homo sapiens. This is because through education that one is best prepared to face the challenges of life, modifies one's consciousness as well as sharpens one's critical sensibility and awareness as well as sharpen one's personality to enable him refine and widen his horizons (cf. Schultz, 1963). The two broad views of what science is are; the static view, which says that science is an activity that contributes systematized information [fact] to the world's existing body which is known as theories, laws, principles etc. The dynamic view entails self discovery through doing or solving problems imaginatively.

On the other hand, technical/technology education is a type of education giving to individuals to enable them get useful employment or to use their skills to create employment for themselves and others. The National Policy on Education (2004) stated that technical and vocational education is used as a

comprehensive term, referring to those aspects of education processes o in addition to general education, the study of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life. Technical education is regarded as education which provides the recipient with the basic knowledge and practical skills needed for entry into the workforce.

Technical education is an integral part of general education meant to prepare an occupational field as an aspect of continuing education for the development of individual and the progress of any given society. It is the education of all about doing things with hands, limbs and brain in order to produce something or adds value to something that has been produced. Fafunwa (1979),made it clearer that African reconstruction, rebirth, development can only become a reality when Africa is prepared to place more emphasis on technical and vocational education. However, today there is a new consciousness towards achieving national stability and economic survival through technical education/business education. Right from the school level there is the introduction of Introductory Technology in the curriculum. Basically, every state in the Nigerian Federation has a good number of secondary technical schools as well as at least a polytechnic. Another interesting development is the emergence of a good number of Technical Universities and those of Agriculture. And there is even one for Military Science Technology.

Technical and Business education is the ingredients of socio political stability and economic survival. For a long time now Nigeria has adopted education as the official ingredient for achieving socio-economic stabilities and political survival. Political stability and economic survival implies development in

real economic terms and also improving the quality of life of the average Nigerian. It is in this perspective that re-examination of Nigerian's place in this fiercely competitive global economy is necessary. Perhaps if we had adopted technical/technology education rather than education generally as an instrument for national stability and economic survival, the nation would have been the better for it. The classic examples of the Asian Tigers viz.: South Korea, Malaysia, Singapore, Indonesia etc not to mention the Economic Giants such as Taiwan, China and Japan, come to mind (cf. Iheanacho, 2006). Unfortunately in Nigeria many graduates of polytechnics and other technical schools rather than fulfilling the desired man-power needs of their training drift into universities just to obtain degrees. This drift is not only financially wasteful but also undermines the effective utilization of critical middle-level manpower.

Role of Academic Libraries in Advancement of Science and Technological Education in Nigeria

The realization of the enormous power of information has made academic libraries and information resources centres inevitably present in all sectors of nation's development. It is glaring that science and technical education institutions aim at endowing its recipient with appropriate skills, experiences, abilities and competences both mental and physical as equipment for the individual to live and to make meaningful contribution to themselves and to the development of the society. These institutions are engaged in harnessing knowledge of the natural and social worlds which affects society's activities and organization. It is an indisputable fact that these institutions are involved in research, teaching and learning.

However, the fact mains that science and technical education institution cannot unilaterally realized its objective without the

supporting role of academic libraries. Academic libraries have always served as a tool for educational advancement at all levels of education (cf. Akintunde, 2004). This is the crunch of the matter. Thus, the main objective of academic library is to provide information resources that will support teaching, learning and research which will now and in future best contribute to the fulfilment of the objective of their parent institutions. This juxtaposed with Daniel (2004) who asserts that library remains the power house of educational institutions and that an educational institution without a library is like a motor car without an engine and a body without a soul. Itedjere, Achuba and Sokari (2012) citing Ajayi (1995) equally maintained that the library is the life wire of academic institutions because it provides the atmosphere and materials conducive and necessary for learning, teaching and research.

The role/relevance of the academic libraries in the advancement of science and technology education in Nigeria cannot be over emphasized. The overwhelming argument is that the science and technological institutions engaged in teaching, learning and research which cannot be effectively and efficiently carried out without a library. In this era of science and technological advancement and information explosion, reliance on lectures note alone is no longer enough for a student to record a reasonable success in the field of science and technology education. To compliment lectures note the library provide the students with varieties of reading materials for his academic success both in print and non-prints format.

In spite of the Government's desire to promote science and technical education programmes in the country, there is drift away from science and technical education generally. However, the objectives of tertiary institutions would be difficult to realize

without the supporting role of the academic library. The unavoidable problem is that research work in the field of science and technology education is face with the inevitable need of consulting the work of other researchers. In other words, advance of science and technology depends on the accumulation of scientific and technological data and every scientist or technologist stands on the shoulders of hundreds other scientist or technologist. These work no doubt are better preserved in the library. Attama and Ezema (2015) state that the major aim of academic library is to provide information resources that will support teaching, learning and research. The collection of an academic library is mainly a function of the courses and programmes offered and the research being conducted in the institution.

As a result of this unique role of the academic library to institutions of higher learning that no tertiary institution including those of science and technology education in the country can be successfully accredited as one without a library house in it. Academic libraries are viewed as an important component of the massive educational effort of the Federal Government of Nigeria, without the library no meaningful academic efforts can be carried out. It is a living force in the advancement of science and technology at all level. By this, you can agree with me that academic library is a sine qua nonfor science and technological education in Nigeria.

Methods of Information Dissemination in Academic Libraries and their Impact on Science and Technical Education in Nigeria

Information is central to human existence. It is therefore the lifeblood of any organized society. Okogwu and Nnam (2013) maintained that information is required by all to address the

nagging question of what, how, where and why which prompt people to search through different information sources to satisfy their curiosity and clear ambiguity.Ugah (2014) citing Aina (2014) defines information as statements of facts that is received by human and have some worth to the recipient. It is news or fact about something that is communicated about a particular fact or circumstance, and provides new information.

To disseminate means to spread information, knowledge, etc, so that it reaches many people. Therefore, information has to be disseminated before it is used in decision making. When information is not disseminated, it cannot reach the people or the target audience it is intended for and cannot be utilized. In other to satisfy information needs of academic community, the following are methods that could be used in disseminating information resources on science and technical education in Nigerian academic libraries:

1) Use of Oral Media: Oral means of information is the oldest means of information dissemination in human history. Many people believe one of the best oral ways of disseminating science and technical education information to academic community in Nigeria is the use of traditional associations and institutions like students unions, churches, mosques, cultural groups, women associations and the like. Oral means of disseminating of is the process of verbally transmitting information or ideas and messages from one individual to another or group of individuals by words of mouth (cf. Ugah, 2014). Some of the advantage of oral means of communication is that it is less formal and more personal than written information. It is more flexible. Different aspect of an issue on science and technology and other disciplines can be discussed and decisions are quickly reached. Student union/association or

groups command the attention and loyalty of their members and therefore are good media for information dissemination especially in science and technical education.

2) Public Enlightenment: Academic library can collaborate with the schools and departments and mount an awareness/enlightenment campaign in their institutions to enlighten the students/people on the prevailing science and technology issues, especially those that are common in the institutions of higher learning. Audio visual like videos, posters, films etc concerning innovations in sciences; technologies can be shown to the audience to make them have a vicarious experience of the subject matter. An expert can be brought in to deliver talks and give some explanations during the occasion. Well designed and colourful posters with catchy messages written in English and local languages are very good vehicles for public enlightenment and awareness campaigns.

3) Displays and Exhibition: periodically, small exhibitions of newly acquired books on one subject or on a number of related subjects are made available in academic libraries. The exhibition may also be made outside the library but around its premises. This is what is meant by library display. They can equally be made on pictures, engineering drawings, posters et cetera; or on anything that can call the attention to a given field. Library display is part of current awareness services. The aim is just to create awareness of information resources newly acquired in the library, to provoke demand and stimulate inquiry that would lead to the full exploitation of library resources and to improve the patronage of the library. Increased readership or library patronage on science and technological information resources has the effect of decreasing illiteracy and ignorance in wider society especially in the area of science and technology.

4) Information Packaging: This simply means ways of adopting information to suit the desired information need of any user or group of users. In information packaging, the librarian rearranges or repackages the contents of information in such a way that it would satisfy the information needs of the user, given his/her background. Packaging and rearranging of information can be done through many ways; language repackaging, content repackaging and medium repackaging among others.

5) Workshop, Seminar and Lectures: Another means of sharing ideas and passing information to people is workshop, seminar and lectures. Academic library in collaboration with departments, agencies, and research institutes organized workshops, seminar or lectures in the higher institutions of learning to address the science and technological problems that are peculiar to their institutions. Leaflets and pamphlets written in vernacular and English language on the subject matter can be freely distributed to the academic library.

6) Extension Services: Extension services are usually introduced especially when the library is satisfied that it has at least, met the minimum level of bibliographic services expected of it to its immediate user community. However, in order to disseminate information resources on science and technological education among academic community, academic libraries need to practice one of their major role of extending their services to nearby community. This includes mobile library services. Extension services would entails story telling services to the youth and children; film shows; visits to schools and colleges, usually to encourage reading habits, reading clubs or reading programmes. It equally includes public entertainment on library use.

7) The Internet: The internet is an informational network of computers which are physically separated. The individual computers in the network share data exchange by allowing users interconnected computers to communicate in real time. The internet is the latest entrant on the various means of dissemination of information (Nnadozie, 2014).

Conclusion and Recommendations
The world is now geared towards science and technical/technology. However, science and technical education can hardly advance without relevant information on prospects and challenges. Therefore a need for professionally managed academic libraries should be put in place if total quality is to be achieved, because apart from making the information that enables decision making timely available, library especially academic library also contributes significantly to the dissemination of information that will advance/enhance science and technical education in Nigeria and globally. Academic libraries been reservoir of knowledge, are the most reliable information reference centres where science and technical students, lecturers and researchers can seek information for professional skills and the advancement of the society.

Unfortunately, the greatest challenge militating against information provision by academic library to promote science and technical education in Nigeria are inadequate funding, poor information infrastructure, lack of skilled manpower, lack of reading culture, and inconsistency in information policy among others.

Eventually, in view of the above submission, adequate funding of academic libraries by the government, investment in human

capital development, review of the nation's information policy, adequate literacy awareness by government as well as alternative sources of funding by the academic libraries, e.g. NGOs, Philanthropies etc, are some of the recommendations made if Nigeria will join the global community in the use of academic libraries for technical and scientific development.

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