The Woman Librarian's Roles in Developing STEM Education for Economic Growth and Sustainable Development in Nigeria

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ABSTRACT

This paper examines the role of women librarians in developing STEM education for economic growth and sustainable development in Nigeria. It discusses issues in STEM education in Nigeria, drawing from available related literature. Also, challenges in STEM education in Nigeria was examined, as well as the roles that women librarians need to play in developing STEM education. Such roles include advocating for and assist in the establishment of school libraries; training of teacher-librarians; prioritizing provision of STEM-related information; stimulating the interest of girl-child in STEM education; teach information literacy and ICT and career guide/ counselling.

Keywords: STEM education, women librarian, Economic growth, sustainable development

INTRODUCTION

Nigeria, as a developing nation, is characterized by consuming more than what she produces, especially when viewed within the context of other countries like Japan and China which they gained independence almost the same period. Science and technology lay a rock solid foundation for any country that want to thrive, be a global leader and improve her economy and development. It is evident that innovation and creativity are portent factors in staying at the fore and sustaining such position in the comity of nations. Super powers like USA, Japan, Russia and China are known to be highly developed in Science, Technology, Engineering and Mathematics (STEM) education and equally budget billions of dollars for the development of STEM education in their respective countries. It is therefore imperative for any country that aspires to be so respected to invest productively in STEM education.

STEM education cut across the three educational levels, namely: primary, secondary and tertiary levels. For a robust and effective STEM education to be achieved, therefore, there is need for information. Information is a major ingredient in engendering development. It is necessary for planning, decision making and completing any given task. Therefore, at every level of education, information is necessary for teaching, learning, research and community development. STEM education in Nigeria are faced with many challenges which decision needs to be taking on solving them as well as planning on what to do. Women librarians, by the virtue of their positon as a unifying factor in the society can combine their education and skills to play their new and challenging roles in providing access to required information to develop STEM education for economic and sustainable development of the country.

ISSUES IN STEM EDUCATION IN NIGERIA

STEM education is very important towards economic growth and sustainable development. Rothwell (2013) points out that as of 2011, 26 million jobs in the United States of America which represents about 20% of all jobs require a high level of knowledge in any of the STEM related areas. He predicts that by 2030, more than half of the jobs in the world will be STEM-based. This shows that STEM education is very important to the future and development of any nation. Similarly, Gabe (2009) affirms that STEM is grossly associated with economic growth and in turn requires the expertise of specialists with adept knowledge in the fields of Science, Technology, Engineering and Mathematics (STEM). STEM education in Nigeria, however, is still struggling to meet up with global standards, and not fully prepared to accommodate this reality.

There is proliferation of technology companies globally, so also the number of jobs requiring STEM-related skills. However, if we look at the nature of STEM education in Nigeria, vis-à-vis students' performance in general examinations on STEM, it is obvious that we are ill-equipped and unprepared for this present reality. Accordingly, BHM (2018) observes that traditional education in Nigeria is failing, with STEM education as the worst hit. Omorogbe and Ewansiha (2013) assess students' performance in STEM-based subjects and discovered that there has been decline in the number of students that passed STEM- based subjects in recent years.

There have been economic issues in the country in the last few years. This has resulted into financial cut in order to save operational costs across Ministries, Departments and Agencies (MDA's). Therefore, financial inputs that are expected to be injected into the development of STEM education has been on a dive in recent years. Financial issue is a major one as it cut across every other area that affect STEM education development. For instance, training and re-training of STEM teachers as well as procurement of teaching/ learning resources are grossly affected by the global economic challenges that many countries are just recovering from.

Another issue is lack of coordination in the development of STEM education in the country. There is need for the establishment and funding of a centre that will seek to the development of STEM education in the country, creating synergy between and among all the stakeholders. As observed by Oludimu (2018), even the Technology Incubation Centre (under the Federal Ministry of Science and Technology) which is responsible for nurturing STEM based businesses is not currently doing enough in nurturing and promoting STEM-based innovations and startups. He called for a restructuring of the centre by the federal government to enable it focus on STEM based products and services as well as the integration of indigenous development.

Quality of teaching and teachers is another issue in the development of STEM education in Nigeria. Ayodele (2016) argues that teaching of STEM has three major aspects namely: (a) learning science (that is, acquiring and developing conceptual and theoretical knowledge); (b) learning about science (that is, developing an understanding of the nature and methods of science and an awareness of the complex interactions between science and society); and (c) doing science (that is, engaging in and developing the expertise in scientific inquiry by using the methods and procedures of science to investigate phenomena and solve problems). Therefore, the right teaching method and instruction need to be engaged. However, as reassuring as this sounds, the quality of STEM teachers and teaching methods/ aids adopted have always remain a major issue. STEM teachers need to be equipped with necessary skills and teaching aids to be productive and impact knowledge positively into the learners. As Okhiku (2005) submits, teachers are never a finished product, as they need to be retrained to meet up with new developments and innovations which are major characteristics of STEM.

CHALLENGES OF STEM EDUCATION IN NIGERIA

Various studies have identified challenges facing the development of STEM education in Nigeria. Onochie (2018) points out ten main challenges facing science education in Nigeria. This include: instability of science teachers, inadequate teaching/ learning equipment and facilities, cost of teaching aids, inadequate classroom periods, lack of prerequisite knowledge, among others. Also, Ezendu, Nkokelonye and Ezendu (2013) underscore the importance of information to STEM education; pointing out that non-availability of information as to what to integrate as local contents into the STEM curricular to reflect the globalized era constitute as a major challenge to the development of science education in the eastern part of Nigeria. This shows that information is necessary as a major planning ingredient in determining the learning instructions to be passed across to the learners.

Similarly, it has been observed that there is a huge gender disparity the male – female interest in STEM related fields. This gender inequality is engendered by a lot of factors. Akinsowon and Osisanwo (2014) attribute the imbalance to a general stereotype that STEM is strictly for male due to *high level of intelligence and physical ability* it requires. They also point out that many women felt they could not progress career-wise in STEM because of the male dominance in the fields, thereby making others to lose interest in STEM. This often leads to unpreparedness for the opportunities and challenges of the 21st century. Also, other factors that can be attributed to lack of interest in STEM include individual and environmental factors. While some students, naturally, do not have interest in STEM education, some were affected by their environments as there were nothing to encourage or stimulate their interests in STEM. Such environmental factors include attitude of teachers as well as home background.

Non - availability of teaching aids in schools is another major challenge. In many public schools in Nigeria, there are no functional school libraries. This can be attributed to dwindling financial resources, lack of manpower (teacher-librarians), poor maintenance culture among others. Therefore, media resources on STEM are lacking. According to Aboyade and Amusan (2013), Aremo (2012) and Dike (2003), use of media resources in teaching and learning are very potent and makes teaching and learning to be effective thereby stimulating learners interest as well as being a contributory factor to academic performance. Having access to media resources on STEM will enhance the teaching and learning of STEM-related subjects and will also stimulate the interests of both the learners and the students.

Therefore, it is very pertinent to note that the place of availability of information, its accessibility and use are germane to the development of STEM education for economic growth and sustainable development in Nigeria. At every stage of planning and implementation, there is need for information. Without information, it will be extremely difficult to achieve or engender the desired development.

The Woman Librarian

There have always been gender issues in librarianship. Niles-Maack (1998) while tracing the history of librarianship, noted that librarianship in United States has always been dominated by women. However, on the contrary, there is really no gender disparity in librarianship in Nigeria, compared to other professions like teaching and nursing that are female dominated. Sheer (2014) observes that the role of librarians is often seen as a *helping* role; which they need to care for and nurture others who have problems that require information to be solved. Therefore, they are expected to use their natural ability as home and peace makers to solve other people's problems by connecting them to information that can enhance their planning and decision making processes.

A woman librarian is a professionally trained woman in charge of managing library information resources. Her roles in the library may include selection, processing and organization of information materials for easy accessibility. Women librarians combine their qualifications with their personal role as women to provide information services that can enhance people's lives. However, as society and technology change, women librarians are picking up new and challenging roles. Such roles have made them to assume the position of and function as instructors, mediators and even in most cases guidance and counselor.

Women librarians, as central figures in the society, play a crucial role in the provision of information that can transform and build the society. Information needs of people are as diverse as reasons for needing them. While some information users, such as students, may be confused, as to the choice of career, it is the duty of librarians to supply information that may guide them. Therefore, with the significant role that women play in the society, it is expected that they use their charisma as nation builders to develop the society by serving as mediators between the information users and the information they need that can transform their lives and as well benefit the society.

Roles of women librarians in developing STEM education

Women librarians play crucial roles in the society. Such roles are needed to transform the STEM education, especially as it affects the female gender. Therefore, roles of women librarians in developing STEM education in Nigeria include the followings:

- **Advocate for and assist in the establishment of school libraries:** Women librarians need to advocate for the establishment of school library/ media resource centres. School library/ media resource centre stocks various information materials that are significant to the teaching and learning of STEM-related subjects. In addition, women librarians need to throw their support to the establishment of school's libraries by championing the drafting of proposal and policies for such development.

- **Training of teacher-librarians:** There is need for training, re-training and re-skilling of teacher-librarians to enable them function effectively. Therefore, it is the duty of women

librarians to assist in facilitating such training. Such training will focus on school library development, organization of information resources and provision of information services to the users.

- **Prioritizing provision of STEM-related information:** There is need for various association of women librarians to prioritize provision of STEM-related information across boards. STEM has been identified as a pillar for economic growth and sustainable development and need information to thrive. Therefore, it is part of the women librarians' roles to assist in the provision of STEM-related information, in different formats that can be useful for the economic and technological transformation of the country.
- **Stimulating the interest of girl-child in STEM education:** Due to the dwindling interest of female gender in STEM related subjects, it is apt for the women librarians to device programmes stimulate their interests in the subjects. Such programmes may include organizing debates, symposia, exhibitions, training or workshops and excursions on STEM-related areas. They can seek partnership with other corporate bodies or stake-holders to make the such sensitization campaign a successful one.

- **Teach information literacy and ICT:** Information literacy focuses on having the ability to identify information needs, seek for information from reliable sources and use such in an ethical manner to complete a given task. It is building of one's confidence to be an independent and life-long learner. Therefore, as part of the new roles of women librarians, they teach information literacy skills to users to enable be independent learners. Such will assist them to be champions of innovation and creativity which is key to entrepreneurship/ economic growth and sustainable development.

- **Career guide/ counselling:** Also, another important role of women librarians is assisting in the area of career guide and counselling. Women librarians can offer career talk or counselling to the female gender to stimulate their interests on STEM related fields. This can be done by equipping them with necessary information on how to build their career in STEM and be like other important female figures that have achieved tremendously in STEM-related fields.

Conclusion

Science, Technology, Engineering and Mathematics (STEM) related fields are crucial to economic growth and sustainable development of any nation. As a corollary to this, developed nations expend a huge financial resources in developing capacity in STEM related fields. It is also evident that STEM fields are male dominant because it is usually assumed that such fields require adept physical strength. This has resulted into making many female gender not to develop interest in venturing into such fields. Similarly, there are various challenges bedeviling the development of STEM education in Nigeria which need to be tackled to put Nigeria on the global map of technologically advanced nations. Therefore, women librarians, who are professionals, need to play crucial roles in developing the STEM education in Nigeria for economic growth and sustainable development.

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