University libraries-bridging digital gaps and accelerating the achievement of sustainable development goals through information and communication technologies

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Abstract

Purpose – The purpose of this paper is to explore the role of university libraries in accelerating the achievement of sustainable development goals (SDGs) through information and communication technologies (ICTs).

Design/methodology/approach – The study adopted a descriptive survey design using a researcher developed questionnaire for data collection. In all, 103 professional librarians working in all the university libraries in Ogun State, Nigeria were surveyed. Statistical Package for Social Sciences (version 19) was used to run the analysis.

Findings – The university libraries in Ogun State, Nigeria are not lagging behind in the provision of ICT facilities for the delivery of twenty-first century library services. The paper highlights the critical role of university libraries in bridging digital gaps by taking advantage of ICTs to accelerate the attainment of SDGs. ICTs have the capacity to accelerate the actualisation of SDG in all communities. However, illiteracy, lack of political accountability and transparency, lack of financial resources and inadequate power supply were the major challenges impeding the achievement of SDGs in Ogun State, Nigeria.

Practical implications – This paper establishes the role of university libraries in bridging digital gaps through ICTs in order to facilitate the attainment of SDGs.

Originality/value – The paper originality lies in its concise articulation of the roles of university libraries and ICTs in the actualisation of SDGs. Library and information professionals who are eager to contribute their quota to the achievement of SDGs will find this article useful.

Keywords University libraries, Information and communication technologies, Nigeria, Sustainable development goals, Ogun State

Paper type Research paper

Introduction

Sustainable development was a significant theme in the 2005 review of the Millennium Development Goals, and is reiterated in other United Nations summit declarations. World Commission on Environment and Development (1987) defined sustainable development as "development that meets the needs of the present, without compromising the ability of future generations to meet their own needs" (WCED, 1987, part 1, section 2, para. 1). But Ayodele (2007) submits that sustainable development can be broadly defined as the ability of the economy to support the needs of the people of a country over a time, taking into consideration the economic, social and ecological constraints of the country. The United Nations 2030 Agenda for sustainable development emphasis economic well-being and employment, farming and sustainable agriculture, health and hygiene, digital inclusion, gender equality and empowerment of women and girls, education for all, climate change and other issues affecting the environment.

University libraries of the twenty-first century have witnessed a tremendous paradigm shift and are becoming hybrid spaces that integrate new activities supported by networked digital technologies side by side with the traditional model (Okojie, 2010; Wyatt *et al.*, 2015). Beyond serving as the "intellectual heart" of the universities (Marmot, 2014, p. 64) university libraries are technology centres (Fallin, 2016) capable of bridging digital gaps and accelerating the achievement of sustainable development goals (SDGs). University libraries as hubs or centres where people come to access resources and interact with others, can also "act as catalysts or conduits capable of connecting diverse social groups and organizations, and linking different creative and community practices" (Wyatt *et al.*, 2015, p. 9).

The application of information and communication technologies (ICTs) to library service has enhanced academic libraries capacity to unprecedented heights in knowledge management and dissemination of information beyond the physical walls of the library (Akpan-Atata and Enyene, 2014). Academic libraries play a significant role in knowledge management which is essential for the transformation of information and intellectual capital necessary for the achievement of SDGs (Wong, 2010). Academics are the best knowledge creators (Lee, 2005) while academic libraries and librarians are the leading player in knowledge management. Universities and research organisations are themselves knowledge reservoirs (Lee, 2005) but university libraries as constituents of the parent university are knowledge repositories (Mahajan, 2005). Supporting this view, Hayes (2004) opined that a university can be viewed as a knowledge factory creating new knowledge through research and by educating knowledge workers, both of which are essential for modern economy; this is made possible with the support of the librarians playing their traditional role of acquiring, organising and disseminating knowledge among the members of the university community to promote research activities and these contribute not only towards the building of knowledge society and knowledge economy but also enhances the achievement of SDGs (as cited in Jain, 2012). University libraries as knowledge centres also provide platforms for the generation, translation, and dissemination of knowledge and these are critical catalysts to accelerate the achievement of SDG agenda at all levels.

ICTs and the internet play crucial role in the achievement of SDGs. According to Souter *et al.* (2010, p. 5) ICTs are "increasingly fundamental to the organisation of economic production and exchange, to social dynamics and to the exchange of information and other resources". The accessibility of information resources and services through ICTs also affect both the quality and the sustainability of economic, social and environmental development. Indeed, sustainable development cannot be:

> […] conceived without global communications and knowledge exchange. The closer we consider today's communications channels, the more aware we become of the paramount importance of the Internet to the flow of information and knowledge around the world. The Internet governance debate, which includes issues of access, multistakeholder participation, openness and security, among others, is essential for global communication and knowledge exchange, in that its outcomes will affect our ability to manage the social, environmental and economic aspects of sustainable development (MacLean *et al.*, 2007, p. 1).

In Nigeria, academic libraries and librarians employ ICTs to capture, analyse, organise, store, and share internal and external information resources for effective knowledge exchange among users through the Online Public Access Catalogue thus bridging digital gaps unlike any other institution. Knowledge exchange and knowledge sharing as crucial aspects of knowledge management (Maponya, 2004) promote knowledge transfer which is indispensable in SDGs achievement. Against this backdrop, this study was undertaken to ascertain the role of academic libraries in accelerating the achievement of SDGs through ICTs. The following research questions guided the study:

RQ1. What ICT infrastructure facilities are available in university libraries in Ogun State?

RQ2. What are academic librarians' perceptions of the role of libraries in the achievement of SDGs?

RQ3. What are academic librarians' perceptions of the role of ICTs in actualising SDGs?

RQ4. What are academic librarians' perceptions of the challenges impeding the implementation of SDGs in Ogun State, Nigeria?

Review of related literature

Access to information is a fundamental human right and a strategic resource for the actualisation of sustainable development (Vijayakumar and Vijayakumar, 2004; Shafack, 2016). Libraries are the only hub in most community where people access free information that will help improve their education, acquire new skills, make informed decisions, as well gain insights on pertinent issues. This uniqueness makes libraries and information services important for bridging the digital gap and accelerating the actualisation of SDG. Libraries also provide access to information in all formats and delivery services that meet the needs of people in a dynamic and complex society (Shafack, 2016).

Libraries in every part of the world can be reliable mechanisms for supporting the delivery of SDGs and programmes (Shafack, 2016). Libraries protect the right of users to access information in a safe environment. Libraries are socially and culturally inclusive. They can help people to have access to services in public institutions and also act as gateways to new e-government services and civic participation (International Federation of Library Associations and Institutions, 2013). Makotsi (2004) stresses that libraries go beyond formal education; they encourage and sustain literacy, and support development.

Krolak (2006) opined that the libraries plays critical role in the creation of literate environments. United Nations Educational, Scientific and Cultural Organization (2000) cited by Shafack (2016) opined that libraries support a society where people from any background can learn, create and innovate. Libraries support a culture of literacy and foster critical thinking and enquiry. Through libraries, people can harness the power of ICTs and the internet to improve their lives and communities thereby accelerating the achievement of SDGs. Opoku-Mensah emphasised that information, knowledge and the use of ICTs are today indispensable tools in supporting sustainable development and improving people's lives. Furthermore, librarians as technological innovators and educators have a natural role in applying ICTs to various types of literacies and inequities such as the digital divide (United Nations Educational, Scientific and Cultural Organization, 2011). Libraries have always been custodians of the world's knowledge, and today are utilising technology to democratise access to information in ways that were unthinkable even two decades ago.

ICTs offer incredible platforms for achieving the SDGs. Every goal in the SDG agenda ranging from ending poverty and halting climate change to fighting injustice and inequality can be positively impacted by ICTs. United Nations (2015) affirmed that ICTs, as a powerful enabler of sustainable development, can make a lot of contributions towards the actualisation of the goals and targets of the 2030 Agenda.

ICTs have changed practices and processes in libraries and have also made access to relevant, accurate and timely information possible. Libraries bridge digital gap and accelerate the achievement of (SDGs) through the use of ICTs. This has topped the debate in support of linking people to the internet and opening ways for access to information in an affordable manner. Libraries are acknowledged as existing sustainable and trusted public institutions which ensure universal access to information through the internet (United Nations Department of Economic and Social Affairs, 2016).

Theoretical framework

There is virtually no universally accepted theory on which libraries, ICTs and SDGs research could be hinged. Nevertheless, the relevant theories used in this paper are basic needs approach theory and systems theory.

Basic needs approach to development are being used increasingly in discussions about development. International Labour Organisation (1976) defined basic needs in terms of food, clothing, housing, education, and public transportation. These are minimum requirements of a family for private consumption. They also include essential services provided for the community at large, such as safe drinking water, sanitation, public transport, and health, education, and cultural facilities.

A critical examination of the seventeen SDGs indicated that the goals address the following major areas: health, poverty, education, equality, climate change, environmental sustainability, partnership and so on. In fact, a key concept of sustainable development is the concept of "needs" in particular the essential needs of the world's poorest people. The basic needs approach, in its various forms, focusses on human development and the recognition that economic development does not take place in a social vacuum. Similarly, SDGs is geared towards human development that is fair, inclusive and sustainable.

Furthermore, libraries through ICTs ensure equitable access to information which is a fundamental right and a basic human need (Maitwe, 2001; Vijayakumar and Vijayakumar, 2004). Information is also a vital resource for sustainable development. Access to relevant and adequate information on food, shelter, security, democracy, health, education, gender equality and so on helps a nation to develop. Information enables people to improve their livelihood and meet their basic needs. It also helps people to become knowledgeable on how to live meaningful lives and manage their environment (Karki, 2006).

Systems theory is an interdisciplinary theory about every system in nature, in society and in many scientific domains as well as a framework with which we can investigate phenomena from a holistic approach (Capra, 1997). A system according to Bertalanffy (1972, p. 417) "may be defined as a set of elements standing in interrelation among themselves and with the environment". Systems can be found in science, in society, in an economic context, within information systems and the environment.

Systems theory is, therefore, a theoretical perspective that analyzes a phenomenon seen as a whole and not as simply the sum of elementary parts (Mele *et al.*, 2010). A fundamental idea of systems theory is its focus on interactions and on the relationships between the parts. Within the purview of system analysis development is an integrated venture and according to (Emas, 2015, p. 3) "sustainable development requires the integration of economic, environmental, and social objectives across sectors, territories, and generations". In 1987 the Brundtland Commission define sustainable development as the "[…] development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations General Assembly, 1987, p. 43). This definition of sustainable development requires that we see the world as a system-a system that connects space; and a system that connects time (Soubbotina, 2004). Since system theory indicates that the activity of any segment of the whole affects in varying degree the activities of every other segment (Thenmozhi, 2015). It implies that socio-economic activities of the past may affect the future and that air pollution in South America could impact negatively air quality in Asia.

Furthermore, systems theory is adapted for this study on the premise that the library can be regarded as a system that has various segments that are interrelated. In fact, the library is a total system with functionally differentiated but interrelated parts such as Acquisitions Department, Cataloguing Department, Readers' Services Department, Serials Department and so on. These departments work together as a system with a single goal of actualising the teaching, learning and research activities of the university.

Research method

The study adopted a descriptive survey design using a researcher developed questionnaire for data collection. This design was considered appropriate because the variables were not manipulated. In Ogun State, Nigeria, there were nine universities – one federal university, two state universities and six private universities. The study population constitutes of all the 103 professional librarians working in all the universities in Ogun State. These are Bells University (8), Covenant University (20), Crawford University (8), Crescent University (5), Federal University of Agriculture, Abeokuta (15), Mcpherson University, Seriki-Sotayo (3), Babcock University (25), Olabisi Onabanjo University, Ago-Iwoye (10), and Tai-Solarin University of Education, Ijagun (9).

The study adopted a total enumeration technique in the choice of its population. This was because of the small number of the population of professional librarians in these libraries. The total number of questionnaire distributed was 103, while 77 were retrieved resulting to 74.76 per cent. The researchers made use of descriptive statistics such as percentage, frequency and mean for data analysis. Statistical Package for Social Sciences (version 19) was used to run the analysis.

Descriptive statistics, such as frequency counts and percentages, were used to analyse *RQ1*. For the analysis of *RQ2* and *RQ3* mean was used. To facilitate the analysis of the responses, values were assigned to the responses, in a 4-point scale. A cut-off point of 2.5 was used to determine which of the items was regarded as accepted or in agreement with the statement. Items on the questionnaire with a score less than 2.5 was regarded as not being accepted or not in agreement with the statement in the questionnaire, whereas any item with a mean of greater than 2.5 was regarded as being accepted or in agreement with the statement in the questionnaire. For the analysis of *RQ4* a three-point Likert scale was used to determine the respondents' perception of the critical challenges raised. The cut-off point was obtained by adding the values in the scale $(1+2+3=6)$ and dividing by 3 to obtain a mean of 2.0. Any item ranked greater than 2.0 was regarded as being accepted, whereas any one less than 2.0 was regarded as being rejected.

Demographic information of respondents

The background data collected from the respondents revealed that majority of the respondents 64.9 per cent were females as against 35.1 per cent male counterparts. The age distribution indicated that majority (42.9 per cent) of the respondents were between ages 41 years and above; 19.5 per cent were between 31-35 years; 16.9 per cent were between 36-40 years; another 16.9 per cent were between 26-30 years, while 3.9 per cent were below 26 years. The educational qualification of the respondents showed that 54.5 per cent of the respondents were MLS degree holders, 23.4 per cent were BLS degree holders, 13.0 per cent were PhD degree holders, while 9.1 per cent had various degrees. The work experience showed that majority (37.7 per cent) had 6-10 years work experience, 24.7 per cent had 11-15 years' work experience, 20.8 per cent had 1-5 years work experience, 11.7 per cent had 16-20 years' work experience, while 5.2 per cent had 21 years and above work experience. As regards status/designation of respondents, majority (32.5 per cent) were librarian 11, 28.6 per cent were librarian1, 18.2 were assistant librarians, 13.0 per cent were senior librarian while 7.8 per cent were principal librarian and above.

Empirical results

RQ1: What ICT infrastructure facilities are available in university libraries in Ogun State?
Details of finding on availability of ICTs in university libraries in Ogun State are presented in Table I.

The findings in Table I show that the university libraries in Ogun State are not lagging behind in the provision of ICT facilities. However, the libraries need to provide more video conference tools, radio frequency identification (RFID) facilities, barcode facilities as well as key into the use of smartcard technologies.

ICTs	Available		Not available	
	F	%	F	%
Photocopiers	77	100	0	0.0
Printers	77	100	0	0.0
Laptops	77	100	0	0.0
Wireless internet access (WIFI)	76	98.7	1	1.3
Computers	76	98.7	1	1.3
Mobile phones	76	98.7	1	1.3
Online databases	75	97.4	2	2.6
Internet	74	96.1	3	3.9
E-learning facilities	74	96.1	3	3.9
Scanners	71	92.2	6	7.8
Tablets	71	92.2	6	7.8
CD-ROM databases	71	92.2	6	7.8
Online Public Access Catalogue (OPAC)	70	90.9	7	9.1
Digital cameras	65	84.4	12	15.6
Mobile phones with WAP wireless application protocol	61	79.2	16	20.8
Video conference tools	48	62.3	29	37.7
Radio	44	57.1	33	42.9
Television	44	57.1	33	42.9
Projectors	40	51.9	37	48.1
Intranet	40	51.9	37	48.1
RFID facilities	39	50.6	38	49.4
Barcode facilities	38	49.4	39	50.6
Electronic theses and dissertations	37	48.1	40	51.9
Smartcard technologies	5	6.5	72	93.5
Fax machines	5	6.5	72	93.5

RQ2: What are academic librarians' perceptions of the role of libraries in the achievement of SDGs?
The academic librarians' perception of the role of libraries in accelerating the achievement of SDGs is presented in Table II.

The result of the analysis in Table II revealed that all the items listed attracted mean scores greater than 2.50 which proved that libraries play significant role in the actualisation of SDGs. Libraries role in building strong knowledge society through effective service delivery attracted the highest mean score of 3.77; digitisation of local content and building institutional repositories had a mean of 3.74; facilitating easy access to development information and data dissemination also had a mean of 3.71; organising of conferences/seminars/workshops on sustainable development and creating awareness and disseminating information on SDGs had a mean of 3.69. None of the items in Table II were rejected by the respondents.

RQ3: What are academic librarians' perceptions of the role of ICTs in actualising SDGs?
The findings on ICTs role in the achievement of SDGs are presented in Table III.

The result in Table III showed that all the items listed attracted mean scores greater than 2.50 which proved that ICTs play a crucial role in SDGs implementation. As regards health information ICTs play significant role in facilitating collaborative health research, this had a mean score of 3.70. This is followed by facilitating increased access to current medical books and journals which had a mean score of 3.68. In the area of gender empowerment, opens up new frontiers for professional development had a mean score of 3.69 while increase women's level of confidence and independence attracted a mean score of 3.68. Similarly, as regards poverty reduction, enable farmers to participate in advocacy and cooperative activities and

Libraries Roles	SA	A	D	SD	Mean	SD	Decision
Building strong knowledge society through effective service delivery	62	12	3	0	3.77	0.510	Agree
Digitisation of local content and building institutional repositories	62	10	5	0	3.74	0.571	Agree
Facilitating easy access to development information and data dissemination	59	14	4	0	3.71	0.559	Agree
Organising of conferences/seminars/workshops on sustainable development	57	16	4	0	3.69	0.568	Agree
Creating awareness and disseminating information on sustainable development goals	59	13	4	1	3.69	0.634	Agree
Exhibition and dissemination of research output	56	18	3	0	3.69	0.544	Agree
Provision of health information for disease control and prevention	57	15	5	0	3.68	0.595	Agree
Promoting learning and reading culture for national development	58	13	6	0	3.68	0.616	Agree
Connecting researchers through ICT resources and facilitating cross fertilisation of ideas for sustainable development goals actualisation	55	18	4	0	3.66	0.576	Agree
Provision of access to diverse information resources for sustainable development	51	22	4	0	3.61	0.588	Agree
Creating learning hubs and inspiring the construction of new knowledge	54	17	5	1	3.61	0.672	Agree
Participating in capacity building through information literacy for the actualisation of sustainable development goals	52	20	4	1	3.60	0.654	Agree
Bridging gender gap by non-discriminatory provision of access to ICT facilities	50	22	4	1	3.57	0.658	Agree
Facilitating knowledge exchange and networking among community of practice	49	23	5	0	3.57	0.616	Agree
Provision of access to information and creating awareness of poverty alleviation programmes	49	22	6	0	3.56	0.639	Agree
Support development information generation and management	47	25	5	0	3.55	0.619	Agree
Promotion of unlimited access to economic information and innovations	50	16	11	0	3.51	0.737	Agree
Translation of sustainable development goals into indigenous languages	51	14	11	1	3.49	0.788	Agree
Repackaging of sustainable development goals into diverse formats	44	27	5	1	3.48	0.681	Agree

opens up new vista for upskilling and expansion of capabilities had mean score of 3.58, respectively. While promotion of increase in productivity had a mean score of 3.57, facilitating access to government policies and services had a mean score of 3.57. This implies that ICTs role in the actualisation of SDGs is not in doubt.

RQ4: What are academic librarians' perceptions of the challenges impeding the implementation of SDGs in Ogun State, Nigeria?
Details of the result of academic librarians' perceptions of the challenges impeding the implementation of SDGs are presented in Table IV.

The result on challenges impeding the implementation of SDGs is presented in Table IV. It showed that illiteracy and lack of political accountability and transparency had the highest mean score of 2.78, lack of financial resources had mean score of 2.74, and inadequate power supply had mean score of 2.70. The least challenge is non-involvement of key players in policy implementation which had a mean score of 2.55. This finding supports the assertion of the UNESCO Institute for Lifelong Learning (2015) that "sustainable development cannot be realized without educated people". The government therefore needs to urgently develop policy on the achievement of the Sustainable Development by promoting a transformative and holistic approach to the empowerment of disadvantaged individuals, families and communities (UNESCO Institute for Lifelong Learning, 2015). Similarly, the findings support the call by Ofor

ICTs Roles	SA	A	D	SD	Mean	SD	Decision
Health information							
Facilitate collaborative health research	59	14	3	1	3.70	0.608	Agree
Facilitate increased access to current medical books and journals	56	18	2	1	3.68	0.595	Agree
Support translation of technical health information into indigenous languages	60	11	4	2	3.68	0.697	Agree
Facilitate knowledge exchange and networking among health workers	55	18	4	0	3.66	0.576	Agree
Facilitate ease of health communication and data dissemination	52	21	4	0	3.62	0.586	Agree
Promote just-in-time access to current health information	46	27	3	1	3.53	0.640	Agree
Provide faster access to health information at a reduced cost	48	24	2	3	3.52	0.736	Agree
Facilitate repackaging of health information in diverse formats	47	24	5	1	3.52	0.681	Agree
Promote increased monitoring and information sharing on diseases	51	12	14	0	3.48	0.788	Agree
Gender empowerment							
Opens up new frontiers for professional development	56	18	3	0	3.69	0.544	Agree
Increase women's level of confidence and independence	55	19	3	0	3.68	0.549	Agree
Promote women's self-development, self-dignity, and a better life	56	16	5	0	3.66	0.598	Agree
Promote global partnership	57	15	4	1	3.66	0.641	Agree
Enhance knowledge acquisition and political empowerment	53	21	2	1	3.64	0.605	Agree
Break social and cultural boundaries	54	17	4	2	3.60	0.712	Agree
Encourage knowledge sharing	52	20	4	1	3.60	0.654	Agree
Promote effective integration of resources and services of network partners	47	27	3	0	3.57	0.572	Agree
Bridge digital gap	47	27	3	0	3.57	0.572	Agree
Enhance gender networking	46	27	4	0	3.55	0.597	Agree
Give women wider exposure to best practices	47	26	2	2	3.53	0.680	Agree
Expand economic and job opportunity among women	44	27	5	1	3.48	0.681	Agree
Promote competence and effectiveness in service delivery	48	25	3	1	3.56	0.639	Agree
Ensure access to and control of knowledge and material resources	47	25	3	2	3.52	0.700	Agree
Promote the acquisition of multiple skills	44	22	11	0	3.43	0.733	Agree
Poverty Reduction							
Enable farmers to participate in advocacy and cooperative activities	53	16	8	0	3.58	0.676	Agree
Opens up new vista for upskilling and expansion of capabilities	52	18	7	0	3.58	0.656	Agree
Promote increase in productivity	54	15	6	2	3.57	0.751	Agree
Facilitate access to government policies and services	50	20	7	0	3.56	0.659	Agree
Bridge rural-urban divide	53	14	9	1	3.53	0.754	Agree
Increase broad and real time access to market information and reduce transaction cost for poor farmers and traders	51	17	8	1	3.53	0.736	Agree
Increase transparency and accountability of government	53	14	6	4	3.51	0.853	Agree
Facilitate job search and job mobility	49	19	9	0	3.51	0.700	Agree

Table III.
ICTs roles in the achievement of sustainable development goals

Challenges	Very critical	Critical	Not critical	Mean	SD
Illiteracy	58	13	2	2.78	0.476
Lack of political accountability and transparency	57	15	1	2.78	0.448
Lack of financial resources	55	16	2	2.74	0.497
Inadequate power supply	52	19	2	2.70	0.515
Lack of reliable data	49	22	2	2.66	0.528
Lack of technical capacity to implement programmes	49	21	3	2.65	0.556
Neglect of libraries and information centres	48	21	3	2.64	0.559
Lack of national commitment and political will	46	26	1	2.64	0.511
Dearth of ICT infrastructures/facilities	44	26	3	2.58	0.570
Non-involvement of key players in policy implementation	41	29	3	2.55	0.575

Table IV.
Challenges impeding the implementation of sustainable development goals

and Ofole (2014) on the need to implement policies that will promote transparency and accountability; overcome institutional constraints; promote pro-poor growth; bring about structural change; enhance distributive equity; engender social and cultural re-orientation; engineer political transformation and promote human development in Nigeria.

Discussion

Interestingly, the respondents were young in the profession but highly educated. Level of education is strongly linked to ICT adoption and usage. Studies revealed that young professionals and well educated people are highly confident in their ability to use sophisticated ICTs tools (Brancheau and Wetherbe, 1990; Olatokun, 2009). Findings from this study also revealed that university libraries in Ogun State were sufficiently equipped with ICTs for service delivery. However, the libraries need to procure and adopt RFID technologies, smartcard technologies, and barcode technologies for more effective and efficient services as well as for security of the library. Most libraries around the world are using these technologies for circulation management, inventory and security of library collections (Singh and Mahajan, 2014) and university libraries in Ogun State cannot be left behind.

Role of libraries in the actualisation of SDGs

As regards the role of libraries in the actualisation of SDGs, the result indicated that librarians in Ogun State, Nigeria are well informed that university libraries have a vital role to play in making SDGs a reality in the State. It is evident from these findings that the library as a major source for information, serving a wide spectrum of information seekers, is not only critical but also central to the facilitation of knowledge generation and building of knowledge society (Tise, 2009) which is fundamental to the actualisation of SDGs. The findings affirm libraries role in the provision of timely access to information for all which is vital to eradication of poverty and inequality, improvement in agriculture, provision of quality education, and support for people's health, culture, research, and innovation (International Federation of Library Associations and Institutions, 2014).

Furthermore, the findings of this study also confirm that sustainable development could be realised with greater success if libraries play their roles in information provision and dissemination. Libraries role must be seen against the backdrop of the fact that the development of the society and individuals can only be attained through the ability of well informed citizens to exercise their democratic rights and to play an active role in the society (Drotner, 2005). Shafack (2016) also stressed that information drives the knowledge economy of the society, transforms the human minds for development, and enhances capacity building which is all fundamental for the achievement of sustainable development.

The finding in Table IV shows librarians perception of the role of ICTs in the achievement of SDGs. According to Souter *et al.* (2010) ICTs have radical impact on economic and social change at global, national and local levels and therefore are critical to the attainment of SDGs agenda. The findings is in agreement with International Federation of Library Associations and Institutions (2014) declaration that libraries and other information intermediaries can use ICTs to bridge the gap between national policy and local implementation to ensure that the benefits of development reach all communities.

ICT and health information

SDG 3 aims at ensuring healthy lives and promoting well-being for all at all ages. The result of this study indicates that facilitating collaborative health research and increased access to current medical books and journals emerged as significant role of ICTs. This finding is consistent with the assertion of Toussaint *et al.* (2004) that collaborative work among healthcare professionals is enhanced by most applications of ICT. Similarly, access to accurate, timely, reliable and relevant health data and information is the most fundamental

step towards the actualisation of SDG 3. The Federal Republic of Nigeria Revised National Health Policy (2004) recognises the role information has to play in achieving healthcare objectives.

ICT and gender empowerment

Gender equality and empower all women and girls is SDG 5. ICTs are powerful tools for advancing gender equality and women empowerment. Access to ICTs can promote sustainable socio-economic development and bridge the gender digital divide (Wamala, 2012). The result of this study reveals that ICTs opens up new frontiers for professional development and increase women's level of confidence and independence. This finding is in agreement with the study conducted by Karan and Raj Mathur (2010) which also gives an impression that ICT leveraged information and knowledge can create digital opportunities, increases level of confidence, enhances technical skills and makes a difference in the lives of Indian women, and over time, helps bridge the digital divide.

ICT and poverty reduction

Ending poverty in all its forms everywhere by 2030 is SDG 1. One of the five targets of this goal is to double the agricultural productivity and the incomes of small-scale food producers, particularly women, indigenous people, family, farmers, pastoralists and fishers. The result of this study indicates that ICTs enable farmers to participate in advocacy and cooperative activities, opens up new vista for upskilling and expansion of capabilities, promote increase in productivity, facilitate access to government policies and services among others. This is in agreement with the remarks of Food and Agricultural Organisation (2016) that ICTs could help agricultural cooperative members to increase their efficiency, improve food security, achieve poverty reduction, and fulfil social development goals.

Conclusion and recommendations

From the study results it is obvious that the university libraries in Ogun State are not lagging behind in the provision of ICT facilities for the delivery of twenty-first century library services. However, the libraries need to provide more video conference tools, RFID facilities, Barcode facilities as well as key into the use of smartcard technologies. The findings clearly indicated that libraries play significant role in the actualisation of SDGs. Similarly, ICTs are widely seen as opportunities to bypass historic development constraints. They have the capabilities to facilitate the actualisation SDGs agenda at all levels in Nigeria if they are adequately provided. ICT offers an acceleration of technology uptake in all health, education, financial services and infrastructure sectors. They do so by reducing the unit costs of service delivery; expanding the range of services that can be offered; and economising on scarce resources. The result indicates that there is need to tackle illiteracy, lack of political accountability and transparency urgently in Nigeria in order to achieve SDGs. Sustainable development is widely seen a challenge that must be met by all nations. Nigeria in general and Ogun State in particular must not be left behind in the attainment of SDGs like the Millennium Development Goals. Information and knowledge is fundamental in the transformative agenda of the SDGs and these must be optimally harnessed. Librarians as purveyors of development information must become key agents in supporting the national implementation processes through the provision of information for SDGs actualisation. The following recommendations are made based on the findings of this study:

(1) Each university library system should be developed into virtual learning centre facilitated by ICTs. This will enable the libraries to function effectively as hubs connecting creative minds for knowledge creation as well as enable the libraries to contribute to the actualisation of SDGs.

(2) The university management should deploy the TETFund (Tertiary Education Trust Fund) allocation for equipping and maintaining cutting edge ICT infrastructures in each university. This could encourage increased use of ICTs for knowledge management which is crucial to the implementation of SDGs.

(3) The university libraries should embark on outreach programmes aimed at combating illiteracy aggressively through effective participation in information literacy programmes for increased access to quality information that will enhance education, health and socio-economic needs especially among socially marginalised communities in order to achieve SDGs.

(4) Libraries should acquire and disseminate SDGs information resources to library users and other categories of stakeholders for increase awareness and sensitisation. Awareness must also be created during library workshops and conferences to ensure that librarians understand emerging ICT enabled platforms such as chat-rooms, weblogs, wikis library websites and their capabilities in facilitating the actualisation of SDGs.

(5) Universities libraries and librarians as knowledge managers should spearhead the actualisation of SDGs by providing twenty-first century services such as e-reference services, e-books services, laptop loan services and inclusive e-services not only to staff and students but also community users.

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