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Expectations of Academics from the 21st Century Academic Library: Experiences from Zimbabwe

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Abstract

The study investigated the needs and expectations of academics from two academic libraries. To explore this broad question, the study sought to determine the scholarly communication, research data management, collaboration, teaching and learning, and new pedagogical needs and expectations of academics. The study also identified the social web tools used by academics for maintaining their research. The literature review is anchored in the study's objectives. A quantitative approach that deployed a web-based questionnaire is adopted. Data was collected from a combined sample of 227 academics and the response rate was 60%. The findings reinforce established studies by highlighting that academics expect their libraries to provide scholarly communication support, online information literacy sessions, teaching and learning support, and co-hosting workshops, co-teaching information literacy, co-deploying new technologies and co-publishing. In spite of these expectations, the Zimbabwean academic library is yet to fulfil its expected role of providing the necessary services and resources to academics. It is recommended that academic libraries in Zimbabwe find the means to address the demands made by academics. Further research should compare the views of both academics and the academic library.

Keywords: Academic Library, Higher Education, Zimbabwe

Introduction

The 21st Century information environment is characterised by accelerated technology development and globalised access to information (National Academies of Sciences, Engineering and Medicines, 2019). The 21st Century academic is a modern lecturer and researcher who is appointed to teach, research, engage learners and absorb new discoveries from students, other experts and sources of knowledge in institutions of higher learning (Al-Majed, Al-Kathiri, Al-Ajmi, and Al-Mamam, 2017).

Mushemeza (2016) asserts that in sub-Saharan Africa, academics operate in an environment which is characterised by political, economic, social crises that impact the operations of the higher education system. Because universities play a crucial part in national development through knowledge production (Cloete, Bailey, Pillay, Bunting, and Maassen, 2011), academics as significant contributors through teaching and research should have access to adequate and relevant academic library facilities (Klain-Gabbay and Shoham, 2019).

A 21st Century academic library prioritises the enrichment of academics' teaching, research, knowledge advancement and research output through providing resources and services that meet their needs (*Georgia Technology Library Strategic Plan 2013-2016, 2013*). The changing information landscape within the realm of tertiary institutions has impacted academic libraries; for example, technological advancement and speed of research

production have put academic libraries under intense pressure to adapt to these changes (Jaguszewski and Williams, 2013). In a bid to invalidate the "one-size-fits-all" element, academic libraries have been challenged to understand the complex ever-changing needs of their patrons with the aim of providing relevant and useful services (Mathuews and Harper, 2018). In the face of such demands, academic libraries should no-longer only observe patrons' behaviour, but are now required to find better ways of gathering library patrons' requirements. This situation has compelled academic libraries to apply methods such as usability testing, user interviews and surveys to design services from a user experience (UX) perspective (Young, Choo, and Chandler, 2020).

The main thrust of an academic library is to fully support the roles of academics as one of a group of patrons. Academics depend on academic libraries (Daniel, 2016), because the library contributes immensely towards teaching, learning and research (Kiran, 2010). Borrego and Anglada (2015) attest that the library is the main source of scholarly resources for academics, followed by free online sources. While it is important to acknowledge that the academic library faces competition from other information sources, especially online sources (Bell, 2002), academic libraries should make their resources standout from what their competitors are offering since they have a long standing history of offering credible and scholarly resources (Wilkinson and Lubas, 2016). Additionally, academic libraries offer information literacy programmes which help academics with skills to conduct quality research (Tshuma and Chigada, 2018).

Problem Statement

Academics are expected to access high quality resources and services from their academic libraries (*Research Libraries UK, 2011*). Globally, academic libraries have been prompted to "reinvent their services" (Abduldayan, Dang, Karemani and Obadia, 2016) to ensure that they maintain their long and commendable reputation of service provision (Pinfield, Cox, and Rutter, 2017). African academic libraries in Kenya and Zimbabwe have scaled up their resources through consortiums (Kasalu and Ojiambo, 2015, Chisita and Fombad, 2019). However, Research Libraries UK (2011) noted that a lack of contact with academics created a disconnection between content that academics use and content that libraries provide. Researchers have reported that the disconnection is attributed to poor marketing strategies (Mawere and Sai, 2018) and persistent economic problems in Zimbabwe's institution of higher education (Chinyoka and Mutambara, 2020). Despite these challenges academic libraries are expected to meet academics' teaching and research needs. The main objective of this research is to answer the following question: What are the needs and expectations of modern academics from the academic library? Pursuing this research is necessary, considering that a well-resourced academic library contributes significantly in assisting academics in performing their core duties. It is crucial to go beyond anecdote to understand the needs and expectations of modern academics.

The study aimed to investigate the needs and expectations of modern academics from the academic library. The attendant objectives sought to determine how the academic library can meet the scholarly communication and research needs and expectations, the research data management needs and expectations, and the teaching and learning needs and expectations of academics; the form of support required from the academic library in implementing new pedagogies; the collaboration needs and expectations of academics from the academic library; and identify social web tools used by academics to maintain and promote their research

Literature Review

The 21st Century higher education is considered through the prism of new approaches of internationalisation and trans-nationalisation, quality assurance and educational quality (Avdeeva, Kulik, Koseva, Zhilkina, and Belogurov, 2017). In the face of these developments, universities in Europe have made efforts to improve their quality of teaching and research (Fatkullina, Morozkina, and Suleimanova, 2015). Pham and Tanner (2015) reveal that academics at university are meant to teach students, conduct research, and service the university. As part of fulfilling their duties, academics are using and creating Open Educational Resources (OERs) in teaching and learning, and new pedagogies such as flipped classrooms, blended learning and mobile learning (Bell, Dempsey, and Fister, 2015). Academics

therefore expect librarians to be added in the e-learning systems to access their teaching materials and make them freely available as well as add links of articles, e-books and other licensed content (Braddlee and Vanscoy, 2019).

In Sub-Saharan Africa, specifically in Zimbabwe, institutions of higher learning are faced with economic challenges that have negatively impacted learning, intellectual output, production of knowledge, and adequate infrastructure (Chinyoka and Mutambara, 2020). Academics are challenged to deliver amid these aforementioned obstacles (Majoni, 2014). In South Africa, for example, academics presume that their academic libraries should offer better research support services (Ngibe and Lekhaya, 2016).

Onyancha (2018) reports that in Sub-Saharan Africa, researchers "needs will extend to include knowledge of which tools to use to maximise research visibility, various types of metrics that are used to assess output and impact, … and how to interpret and use metrics". In Uganda, academic libraries are slowly embracing a culture of dissemination of research findings to ensure development of communities (Buwule and Mutula, 2017).

Although research data management (RDM) services are still in their infancy, Chiware and Becker (2018) reveal that in Botswana, Lesotho, Malawi, Namibia, South Africa, Swaziland, Zambia and Zimbabwe, the following services are offered: institutional repositories, copyright and patent advice, general statistical software, data analysis, research data awareness workshops and advice on where to archive disciplinary data.

Academics and librarians in South Africa are co-designing learning events and materials for information literacy (Fullard, 2016; Mohamed 2019; Thomas and Saib, 2013). In South Africa, there is growing collaboration between academics and academic libraries which are being used as publishing spaces (Raju, 2018).

Social web tools such as Twitter (Joubert and Costas, 2019) and ResearchGate (Onyancha, 2015) are used for sharing publications by researchers in South Africa. On a different note, academics in Nigeria demand that academic libraries offer a technological infrastructure, acquisition of e-resources for multiple and concurrent access and creating user awareness of available OERs (Echezona and Chigbu, 2018). Ocholla, Mutsvunguma and Hadebe (2016) highlight that academics in South Africa acknowledged the quality of workshops offered by their academic library.

Regardless of these pressures, African academic libraries just like their parent institutions are under-resourced because they lack funding, technological facilities and there is resistance to change by librarians (Jain and Akakandelwa, 2016). Traditionally, libraries were more concerned about building collections and benchmarking was defined by loan statistics, library usage statistics and book statistics (Hills, 2016). However, in the modern environment, the diverse user communities have become a focal point amongst academic libraries (Hills, 2016). An examination of the literature acknowledges the study's argument that academics in Africa are faced with limited resources. Therefore a study on the needs and expectations of academics from their Zimbabwean academic libraries is imperative.

Conceptual framework

The study applied a conceptual framework compiled from a review of the literature. See *Figure 1*. Each element formed the basis of the questionnaire which was used to interpret the expectations of academics from their academic libraries.

Scholarly Communication and Research Support: Scholarly communication is understood as the system through which research and other scholarly writings are created, evaluated for quality, disseminated to the scholarly community, and preserved for future use (ACRL, 2017:online). Academics expect their academic libraries to offer research support by providing information on new models of scholarship and compilation of bibliographical items (Klain-Gabbay and Shoham, 2019b: 729).

Research Data Management (RDM) Support: The drivers of RDM are the need for research data storage, security, quality, compliance, preservation and sharing (Pinfield, Cox and Smith, 2014: 28). Academics are increasingly encouraged to share their research data in order to increase citations, and because of this they require formal training in all aspects of RDM (Unal, Chowdhury, Kurbanoglu, Boustany, and Walton, 2019: online).

Academic libraries are therefore required to apply the FAIR data principles and make data findable, accessible, interoperable and reusable (LIBER, 2017).

Social Web Tools for Promoting Personal Research: Modern academics are actively using social media to interact socially and academically. In reaching out to academics, social media platforms are being used for instant service delivery in academic libraries (Mabweazara and Zinn, 2016).

Teaching and Learning Support: Academic libraries in the 21st Century offer academics online copyright clearance services, online requests for materials acquisition and selection of short-loan materials (Klain-Gabbay and Shoham, 2019b).

New Pedagogical Support: The new pedagogies is a new teaching structure based online (Wang and Zhu, 2019) and student centred learning where academics partner with students in deep learning (Fullan and Langworthy, 2014:64). Academic libraries are expected to offer online workshops, how-to guides, creating resources for self-directed guides and research activities *inter alia* to academics (Cowan and Eva, 2016).

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Faculty-Librarian Collaboration: Academic libraries are expected to co-teach information literacy programmes and offer research support to postgraduate students with academics (Atkinson, 2018).

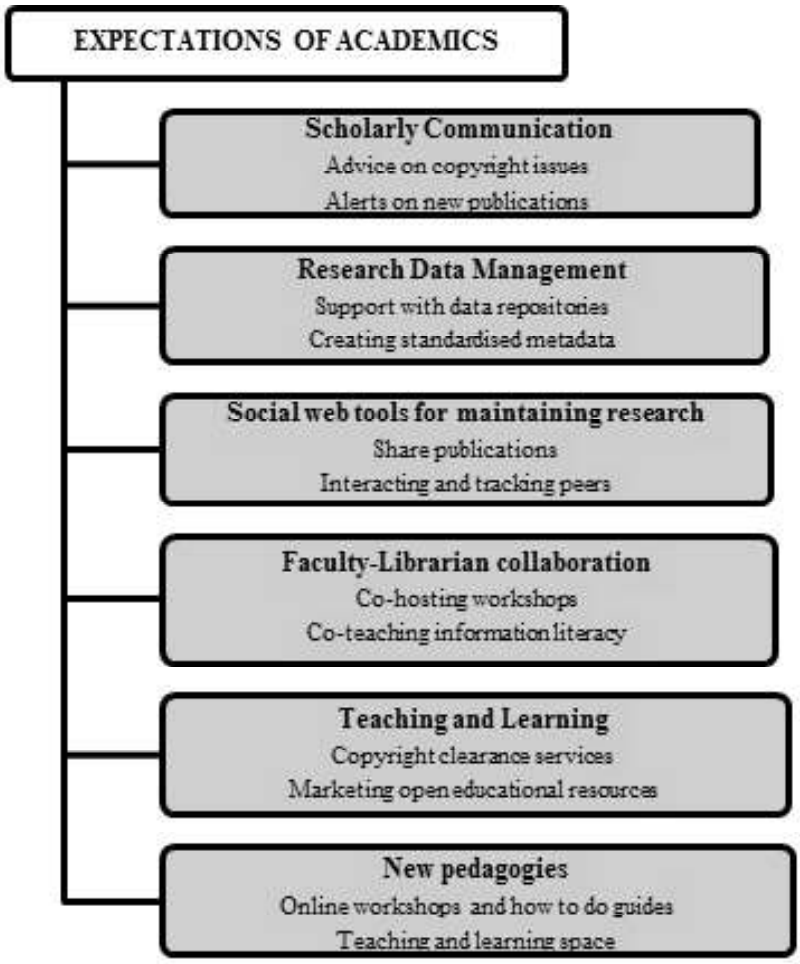

Figure 1: Expectations of academics from the 21st century academic library

Research Methodology

The study was conducted in Zimbabwe targeting two universities, namely, the Midlands State University (MSU) and Lupane State University (LSU). The MSU opened its doors in 1999, and has a total of nine faculties and enrols 20, 635 students. One of the mandates of the MSU is to ensure the "extension of arts, science and learning, the preservation, dissemination of knowledge that is relevant for the development of the people of Zimbabwe" (Midlands State University 2020: online). The LSU was established in 2005; it consists of six faculties and a student enrolment of 3,022. The LSU was established to cater for the underserved communities and one of its core values includes rural community development (*Lupane State University, 2020:* online). These two public universities were selected to provide a comparison since the two universities differ in terms of size, age and areas of focus.

The total population of academics in the two universities was 562. Using Krejcie and Morgan's (1970) sampling framework and assuming a margin of error of 5%, the recommended sample size is 228. The sample size was divided proportionately according to the number of academics in each university. This produced sample sizes of 126 MSU and 101 LSU academics.

The research adopted a quantitative research approach. Data was collected through a web-based questionnaire that included open and closed questions which was distributed via emails. The web-based questionnaire improved data quality by applying validation checks, for example, alerting respondents when they entered implausible or incomplete answers, and it automatically transformed the electronic data into an analysable format (Excel spreadsheet). Data collected from closed questions was analysed using the Statistical Package for the Social Sciences (SPSS) and Microsoft Excel. Data gathered from open-ended questions was analysed using thematic analysis, a method which allowed the identification of patterns and themes of meaning. In this study, coding and themes were guided by concepts underpinning the study. When presenting responses from open-ended questions, each respondent is anonymised and identified by a number followed by the name of institution, for example, Academic #2 MSU for Midlands State University and Academic #2 LSU for Lupane State University.

Results and discussion

This section draws attention to the survey results of the academics' needs and expectations from academic libraries in Zimbabwe. The section locates the findings of this study within the reviewed literature and the conceptual framework. The combined response rate was 136 (60%) participants, with 79 (62%) at MSU and 57 (56%) at LSU. A response rate of 60% is considered good, while a 50% response rate is considered adequate (Babbie 2007).

Scholarly Communication and Research Support

Respondents were presented with a list of scholarly communication requirements and asked to select any requirements which are applicable to their current needs and expectations. Results show that all 136 (100%) respondents either *agreed*/*strongly agreed* to expecting their academic libraries to offer information on Open Access journals and books, links to internal and external research funding, access to institutional research output and scholarly publications, information on digital research and citation management tools and research software packages. On the other hand, respondents either *agreed*/*strongly agreed* that they required flexible bookings for research training its rating was pegged at 51 (79%) LSU and 65 (82%) MSU. These results are presented in Table 1.

The results suggest that academic libraries should offer research support based on all these specified scholarly communication requirements. Pontika (2019) reports that academics in the modern environment require scholarly communication services to help them achieve their research activities.

Table 1. Scholarly Communication and Research Support (N = 136)

Scholarly Communication requirements	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	LSU	MSU	LSU	MSU	LSU	MSU	LSU	MSU	LSU	MSU
	f %	*f* %	*f* %	*f* %	*f* %	*f* %	*f* %	*f* %	*f* %	*f* %
Provision of information on specific accredited Open Access journals and books	8 14	12 15	49 86	67 85	0 0	0 0	0 0	0 0	0 0	0 0
Provision of links to internal and external research funding agencies	9 16	14 18	48 84	65 82	0 0	0 0	0 0	0 0	0 0	0 0
Access to your institutional research output statistics	11 19	15 19	46 81	64 81	0 0	0 0	0 0	0 0	0 0	0 0
Access to scholarly publications	13 23	18 23	44 77	61 77	0 0	0 0	0 0	0 0	0 0	0 0
Provision of reliable information on digital research and citation management tools	13 23	21 27	44 77	58 73	0 0	0 0	0 0	0 0	0 0	0 0
Flexible booking for research training whenever needed	8 14	8 10	43 75	57 72	0 0	0 0	6 11	14 18	0 0	0 0
Regular and instant updates on latest publications related to your field of specialty	14 25	16 20	43 75	63 80	0 0	0 0	0 0	0 0	0 0	0 0
Access to research software packages	14 25	22 28	43 75	57 72	0 0	0 0	0 0	0 0	0 0	0 0

Research Data Management Support

The study sought to find out whether academics expect the academic library to offer RDM tools e.g. RDM planning guides, research data repositories, and data processing software (i.e. R or SPSS). The results revealed that 63 (80%) respondents at MSU and 39 (68%) respondents at LSU never required or expected the academic library to offer RDM support. This finding suggests that Zimbabwean academics are not aware of or receptive to the RDM concept. Academics require RDM training sessions to create awareness and wide acceptance. This has consequences for the quality of Zimbabwean higher education as it may slow down the growth and development of research production. These findings are consonant with Renwick, winter, and Gill (2017) who noted that researchers owned data but did not have enough knowledge or experience in managing it. Tang and Hu (2019) signal that academics require training in data management plans, storage, preservation, sharing and dissemination while librarians require data service skills. Academic librarians are key players in the research data management planning process, data discovery, reuse, collection and management (Brochu and Burns, 2019). The literature is replete with evidence that academic libraries across the globe are faced with a mandate to assist academics with managing their research data through providing credible tools and services such as RDM planning, data repositories and data processing software (Chawinga and Zinn, 2019).

Social Web Tools for Maintaining and Promoting Personal Research

As academics are involved in research activities, they require knowledge of using social media platforms to monitor and track altmetrics for their personal research. Table 2 shows that the majority of academics at MSU and LSU used LinkedIn, Research Gate, Academia.edu and Twitter. Unlike the Zimbabwean based academics, an international survey conducted by Jaring and Bäck (2017) covering Belgium, Finland, Italy, New Zealand, and Romania revealed that only LinkedIn and Twitter were the most used for promoting personal research. The reason for the difference could be that academics in Jaring and Bäck's (2017) study preferred LinkedIn and Twitter because they had used these social media platforms for personal use for several years. However, the platforms favoured by Zimbabwean academics gained popularity in recent years due to an increase in the number of Internet service providers (Internet World Stats, 2011: online). These platforms provide a space for academics to not only promote and monitor their research, but to discuss and connect with local and global professionals in their respective fields. In Zimbabwe, all (100%) respondents at both institutions disagreed that they were signed up on a blog. It is not surprising for

macro-blogs to be less popular among academics in Zimbabwe since macro-blogging is time consuming compared to Twitter (micro-blogging) which has a limited word count. Matthews (2018: online) comments that academics spend most of their time teaching, supervising students' research, conducting personal research and conducting administrative work. Due to these commitments, they barely find time for macro-blogging.

Table 2. Social Web Tools (N = 136)

Social Media Tools	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	LSU	MSU	LSU	MSU	LSU	MSU	LSU	MSU	LSU	MSU
	f %	*f* %	*f* %	*f* %	*f* %	*f* %	*f* %	*f* %	*f* %	*f* %
Blog	0 0	0 0	0 0	0 0	0 0	0 0	57 100	79 100	0 0	0 0
Research Gate	12 21	0 0	45 79	60 76	0 0	0 0	0 0	19 24	0 0	0 0
Academia.edu	3 5	0 0	48 84	58 73	0 0	0 0	6 11	21 27	0 0	0 0
LinkedIn	10 18	6 8	47 82	59 75	0 0	0 0	0 0	0 0	0 0	14 17
Twitter	0 0	0 0	45 79	52 66	0 0	0 0	12 21	27 34	0 0	0 0

Teaching and Learning Support

A closed question requested academics to select their teaching and learning needs from a list outlined in Table 3. All 136 (100%) academics at both institutions *agreed*/*strongly agreed* that they needed support in developing, sharing and accessing Open Educational Resources (OERs), remote access to reference services, alerts on new services and resources, equipment loan (i.e. loaning of laptops) and off-campus access to e-resources. These findings suggest that Zimbabwean based academics need and expect their academic libraries to support their teaching and learning activities by designing, sharing and providing links to OERs, equipment loan, remote access to reference services and e-resources. An open-ended question required academics to mention any additional teaching and learning support expectations other than those presented in Table 4. One respondent from LSU made the following remarks: "more updated teaching and learning software" (Academic #23 LSU). This finding explains that LSU academics expect their academic library to offer updated teaching and learning software. Afebende, Ma, Mubarak, Torrens, Forreira, Beasley, Chu, and Ford (2016) believe that a deficit in technological facilities in developing countries is because of a lack of financial support, but academic libraries are using collaborative efforts to mobilise funding through national, regional and international networks.

Table 3. Teaching and Learning Support (N = 136)

Teaching and Learning support	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	LSU	MSU	LSU	MSU	LSU	MSU	LSU	MSU	LSU	MSU
	f %	*f* %	*f* %	*f* %	*f* %	*f* %	*f* %	*f* %	*f* %	*f* %
Open Educational Resources (OERs)	8 14	28 35	49 86	51 65	0 0	0 0	0 0	0 0	0 0	0 0
Remote access to reference services	14 25	74 96	45 75	5 6	0 0	0 0	0 0	0 0	0 0	0 0
Equipment loan services	7 12	19 24	50 88	60 76	0 0	0 0	0 0	0 0	0 0	0 0
Off-campus access to e-resources	12 21	29 37	45 79	50 63	0 0	0 0	0 0	0 0	0 0	0 0
Alerts on new services and resources	11 19	15 19	46 81	64 81	0 0	0 0	0 0	0 0	0 0	0 0

New Pedagogical Support

All 136 (100%) respondents require their academic libraries to offer online information literacy programmes. The reasoning behind the requirement of online information literacy sessions by academics in Zimbabwe emanates from the need to suit their busy schedules and may also help them hone their digital skills. An open-ended question required respondents to mention any other support they expect from their academic libraries. An academic from MSU commented that "More workshops on the use of new technologies (i.e. social web and citation management, RDM tools and research software e.g. SPSS and R)" are required (Academic #59 MSU). This finding points to the reasoning that MSU academics expect their academic library to equip them with skills for handling new technologies. The use of new technologies requires digital literacy skills and these skills are fundamental in ensuring the advancement in the application of new teaching methods among academic institutions in the current and future environment (Hallam, Thomas, and Beach, 2018). In this light, 21st Century academic libraries should host workshops for academics in the form of information literacy sessions to assist with technological skills and research software.

Faculty-Librarian Collaboration

In the modern academic environment, networking has become a significant requirement amongst university academics. In particular, the 21st Century information environment demands that faculties and academic libraries should collaborate on several activities (Atkinson, 2018). Table 4 highlights that all 136 (100%) academics *agreed*/*strongly agreed* that they required to partner in the acquisition of specific resources. In comparison, all 57 (100%) LSU academics and 72 (91%) MSU academics *agreed*/*strongly agreed* that they required co-hosting workshops and conferences as part of the collaboration efforts. While all 57(100%) academics at LSU required co-deploying new campus technologies, 66 (84%) MSU academics required this service. All 57(100%) LSU and 63(80%) MSU academics required collaboration in teaching information literacy in context and assessment. These findings imply that academics need and expect to collaboratively host workshops and conferences, deploy new technologies, acquire specific resources and teaching information literacy with their academic libraries. Besides the collaborative needs listed in Table 5, academics were asked to provide additional collaborative needs and expectations. An academic at MSU mentioned "collaborative research with some librarians" (*Academic #44 MSU*). This trend points to a positive mind-set among academics, which entails a requirement to partner in knowledge creation with some academic librarians. The findings of this study are supported by prior studies. Rolloff (2013) indicates that academic libraries should be a place to forge new ideas and engage academics in interactive educational workshops. In an African context, Mugwisi (2015), Fullard (2016), and Mohamed (2019) maintain that despite the negative perspectives on teaching, librarians have managed to collaborate with academics in teaching information literacy. Important to note is that collaborative demands made by academics in Zimbabwe have a positive influence on improving the quality of higher education; the academic library should pay attention to these demands.

Table 4. Collaboration support for academics (N = 136)

Collaboration requirements	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	LSU	MSU	LSU	MSU	LSU	MSU	LSU	MSU	LSU	MSU
	f %	*f %*	*f %*	*f %*	*f %*	*f %*	*f %*	*f %*	*f %*	*f %*
Co-hosting workshops and conferences	10 18	9 11	4782	63 80	0 0	0 0	0 0	7 9	0 0	0 0
Acquisition of specific resources	13 23	16 20	4477	63 80	0 0	0 0	0 0	0 0	0 0	0 0
Teaching information literacy	12 21	0 0	4579	63 80	0 0	0 0	0 0	16 20	0 0	0 0
Co-deploying new technologies	11 19	0 0	4681	66 84	0 0	0 0	0 0	13 16	0 0	0 0
Information literacy requests for students	13 23	11 14	4477	68 86	0 0	0 0	0 0	0 0	0 0	0 0

Conclusion and Recommendations

The findings of this study have revealed that modern academics in Zimbabwe expect their academic libraries to offer scholarly communication services (access to latest scholarly publications, research training, and information on research funding agencies, citation management tools, research software packages and institutional research output statistics). These are considered to assist academics in achieving their research endeavours. However, Zimbabwean academics were not yet receptive to RDM tools, as the service was fairly new. The study, therefore, recommends that academic libraries in Zimbabwe should offer all the required scholarly communication support as well as awareness and training in RDM tools, or risk being shunned by the 21st Century academic. To remain relevant in the current environment, academic libraries should assist academics to embrace the culture of effectively using social web tools for research. This is crucial since Zimbabwean academics require new pedagogical support such as online information literacy programmes on the use of new technologies. In order for Zimbabwean academics to carry out their teaching duties without being short-changed, academic libraries should offer updated teaching and learning software. Academics need to co-publish, co-deploy new technologies, co-teach information literacy and co-host workshops and conferences with their academic libraries. Fulfilling academics' collaborative demands may increase the visibility of the library and improve its image and value amongst academics. All expectations identified in this study are fundamental requirements for modern academics to adequately contribute towards the advancement of Zimbabwean higher education.

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Influence of Awareness and Utilisation of Agricultural Information on the Livelihood of Plantain Farmers in Ikenne Local Government Area, Ogun State, Nigeria.

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Abstract

The influence of awareness and utilisation of agricultural information on livelihoods was investigated among 250 plantain farmers who were purposively selected in three communities in Ikenne Local Government Area of Ogun State, Nigeria. It was found that the plantain farmers had a high level of awareness of many of the listed information sources. The utilisation of agricultural information improved their livelihood. There was a significant combined influence of awareness and utilisation of agricultural information on the livelihood of the plantain farmers. It was suggested that efforts should be made to increase the plantain farmers' awareness of agricultural information through the listed information sources so as to improve their livelihoods.

Key Words: Awareness, Utilisation, Agricultural Information, Plantain Farmers, Livelihoods

Introduction

Literature reveals how several aspects of the farmer's life like their productivity and livelihood have been improved by being exposed to agricultural information (Aminu, Falola, Ayinde and Sanusi, 2017; Mgbenka and Mbah, 2016; Kamau, Margret and Hilary, 2018). Agricultural information is required to bring about a change in the way people do farming as well as in other dimensions of farm production. It refers to all forms of data that meets the needs of farmers and keeps them well informed about issues that affect their productivity. It encompasses innovations, advice, techniques, skills, technologies and regulations on environmentally safe practices. Key stakeholders like the government, non-government organisations, agricultural institutions and mass media play significant roles in disseminating agricultural information to farmers. The dissemination of agricultural information through various media has made technical know-how accessible to farmers as well as increased their knowledge about production, processing, transportation and other marketing dimensions of agriculture (Ayawale, Fatunobi and Ojo, 2016; 2018). But without the awareness, agricultural information cannot be accessed when needed by farmers in the rural communities.

Awareness of agricultural information reveals that farmers know about something by showing their understanding of the subject or situation at the present time based on information or experience. This is expressed in their views, interpretation of factual information or technical knowledge and skills required to do something. Efforts are made to create awareness of agricultural information among farmers through the provision of extension services (Ayawale, Fatunbi and Ojo, 2016). The overall objective of any awareness process is the hope that any information shared will be utilised to solve problems and make life easier for the user. Although awareness of agricultural information keeps farmers abreast of the resources they can access, information utilisation is needed to bring about a change in the way people do farming as well as in other dimensions of farm production. Information utilisation refers to the proper

application of acquired information to farming activity. It involves interactions such as reading, viewing and touching to extract relevant information in order to meet a perceived need or accomplish a particular task. It begins when the farmer becomes aware of a need to gather information and analyses the relevance of such information to the problem at hand before attempting to utilise it. Thus, awareness of and subsequent utilisation of agricultural information are fundamental factors for improving farming in rural communities in Nigeria. Looking at the critical role that agricultural information plays in productivity, it is important to have a good understanding of the impact of awareness and utilisation on the livelihood of farmers in rural communities.

Problem Statement

Over the years, plantain farmers have been continuously threatened by challenges like climatic changes, pests and diseases, bureaucracy, exploitation by middlemen, and a lack of financial capacity that limits them to a subsistence level of production (Ayawale, Fatunbi and Ojo, 2016; 2018; Ojo and Ayanwale, 2019). These obvious challenges are devastating to the productivity of plantain farmers as well as their livelihood. These challenges may be attributed to the level of awareness and utilisation of agricultural information by plantain farmers. Research on the influence of awareness and utilisation of agricultural information has focused more on productivity. But there has been little work exploring the influence of awareness and utilisation of agricultural information on the livelihood of plantain farmers in the rural communities in Nigeria. Addressing this research gap will have practical benefits as well as inform future policy objectives in the provision of extension services to plantain farmers in the rural communities. It would contribute empirical evidence on the impact of awareness and utilisation of agricultural information on the livelihood of plantain farmers in Nigerian rural communities.

Scope of Study

The study was carried out in Ikenne Local Government Area of Ogun State in the South-West of Nigeria. This local government area is located between 6p 52N and 3p 43E. It has an average annual temperature of 28 degrees centigrade with rainfalls from March to October. Its land area covers about 179km^2 with a density of 923.8/km^2. The projected population of the inhabitants is approximately 165,700 (NBS, 2016: NPC, 2016). Ikenne local government area was selected in this study because it falls within one of the four agricultural zones listed in the Ogun State Agricultural Development Programme (OGADEP). Farming is a key economic activity of the inhabitants. Plantain is one of the major crops produced in Ikenne local government area. Other crops include cocoa, cassava, pepper and among others. Aside farming, the inhabitants are also known for trading, artisan and craft.

Purpose and Objectives of the Study

The purpose of this study was to find out if the awareness and utilisation of agricultural information could improve the livelihood of plantain farmers in Ilishan, Irolu and Ijesha communities in Ikenne Local Government Area of Ogun State, Nigeria. The specific objectives of this study were to find out the level of:

- awareness of agricultural information among these plantain farmers
- utilisation of agricultural information among these plantain farmers
- income from various sources among these plantain farmers
- Three hypothetical statements tested in this study include:
- the awareness of agricultural information has no significant influence on the livelihood of these plantain farmers
- the utilisation of agricultural information has no significant influence on the livelihood of these plantain farmers
- the awareness and utilisation of agricultural information has no significant influence on the livelihood of these plantain farmers

Literature Review

Unlike other studies that have investigated the awareness and utilisation of agricultural information, this study followed the line of thought of the information utilisation capacity theory (IUCT) due

to its novel aspect of technology in contributing to literature. The information utilisation capacity theory developed by Curras in 1984 informed the basis for explaining how the awareness and utilisation of agricultural information could directly or indirectly influence the farmer's livelihood. Curras explained information utilisation in terms of access which largely depends on awareness. Farmers' awareness of agricultural information can be seen in their ability to identify a range of information sources that exist as well as their understanding of the information presented at the time based on experience. This includes the relevance of the information to solve the problem at hand, the appropriateness of the information source used for dissemination, and the characteristics of the information provider. Information utilisation is determined by the capacity of the user to physically and intellectually access information from various sources (Curras, 1984). Thus, awareness and utilisation of agricultural information would be seen in their understanding, and appropriately applying information extracted or acquired from information sources like extension agents, books, radio, banks, cooperative societies, internet, libraries and online databases, as well as others for the purpose of farming. The utilisation of the right agricultural information at the right time gives farmers the capacity to make informed decisions that could have significant influence on their livelihoods (Yearbook, 2013).

Nigerian economy has its base in agriculture which provides the main source of livelihood for most of her citizens. Livelihood is the particular job and others source of income that provides the money to buy the things an individual needs. The livelihood of a people expresses how they perceive their lives and living conditions. It is an indication of how persons perceive their living conditions pertaining to their income. Income is a source of livelihood (Ikudayisi, Babatunde and Yusuf, 2019). Sustainable income sources translate to better a livelihood which is fundamental to the socio-economic development of a Nation (Khatiwada, et al, 2017). Socioeconomic changes have greater impact on poorer persons, because these persons sustain their livelihoods through subsistence socioeconomic practices. These persons do not have a sustainable source of income and rely on a number of different activities or sources to provide income. It follows that each source of income is important to them because it contributes to the total amount of income obtainable. Farming is one remarkable source of livelihood. It involves the cultivation of plants and rearing of animals for food, shelter and other products to sustain and enhance life. If farmers are to earn a fair return for their hard work, the farming occupation has to be improved so as to enrich the livelihood of everyone involved.

In countries across the world, especially in Africa, plantain farming is the notable form of livelihood among people living in rural communities. In Nigeria, plantain is produced in large quantities in Edo, Delta, Ogun and Ondo states. Other producing states are Rivers State, Cross River, Imo, Anambra, Lagos, Kwara, Benue, Plateau, Kogi, Abia and Enugu (Yearbook, 2013; Map of world, 2016). Plantain farming is a significant economic activity for income generation for both large scale and small scale farmers (Idumah, Owombo, Ighodaro and Mangodo, 2016). Studies put the current annual production in Nigeria above 2.4 million metric tons (Yearbook, 2013; Ayanwale, Fatunbi and Ojo, 2018). About 94% of plantains produced by Nigerian farmers are for market consumption (Ayanwale, Fatunbi and Ojo, 2018) and this accounts for more than 30% of total farm income (Okoroafor, Achike and Mkpado, 2013). The crop offers lucrative farm products that provide a viable prospect for the socioeconomic development of rural communities. Plantain farming holds prospects for wealth creation and improved livelihood of everyone involved. Unfortunately, the livelihoods of these plantain farmers are ceaselessly threatened.

Farmers all over the world want to enjoy good livelihoods. Like other farmers, the plantain farmers in rural communities in Nigeria appear not to be enjoying this because they still face challenges like unfavourable weather conditions, technological advancement, infrastructure and market conditions that are beyond their control. These challenges are devastating to the productivity of farmers as well as their livelihood. Across rural communities in Nigeria, the farmers barely enjoy the good livelihood needed to raise a healthy family. These farmers have no option but to continue working even in ill-health because for them, farming is their means of livelihood. Their productivity is ceaselessly challenged by climatic conditions, pests and diseases, bureaucracy, exploitation by middlemen and a lack of financial capacity that limits these farmers to a subsistence

level (Ayawale, Fatunbi and Ojo, 2016; 2018; Ojo and Ayanwale, 2019). These challenges have been attributed to the level of awareness and utilisation of agricultural information which in turn contributes to the productivity of the farmers. Several efforts have been made by government and development partners to promote a commercial scale of plantain production in Nigeria. For instance, the International Institute for Tropical Agriculture launched large scale awareness on improved agronomic practices, sucker multiplication and post-harvest techniques to smallholder plantain famers through a network of agricultural development programmes across eleven states in the year 2000. To achieve its objectives, this agricultural development programme (ADP) used both farmer participatory and community based technology delivery approaches (Coxhead and Buenvista, 2001) believing these approaches would lead to the spread of information on these technologies to other plantain farms in subsequent years. ADP has since been adapted in many states following the withdrawal of funding by the World Bank in Nigeria (Adebayo and Idowu, 2001).

The agricultural development programme (ADP) still plays significant roles in disseminating agricultural information to farmers with the aim of improving productivity and livelihoods. Improving the productivity as well as the livelihood of plantain farmers would be impossible without creating the necessary conditions for improving agriculture. Among the identified conditions for improving agriculture are creating awareness and utilisation of information on modern practices. Creating awareness is a necessary because many farmers lack knowledge of the existence of relevant information. For instance, various financing opportunities provided by the federal government through the central bank of Nigeria (CBN) are not fully utilised by farmers due to their lack of awareness (Ojo and Ayanwale, 2019). Plantain Farmers need to be aware of all relevant agricultural information so as to benefit from the access to funds, the changing techniques and innovations in farming as well as other dimensions of agricultural production.

Creating awareness involves communicating ideas, innovations and techniques to farmers through an appropriate medium to improve productivity and livelihoods (Ayawale, Fatunbi and Ojo, 2016). Agricultural information encompasses innovations, advice, techniques, skills, technologies and regulations on environmentally safe practices. Access to content specific agricultural information are often made available through various sources like books, posters, Internet, TV and radio programmes. Despite this, many farmers in Nigeria lack awareness and are not personally able to use information these sources because of their level of literacy (Mgbenka and Mbah, 2016). Although the utilisation of agricultural information is often hindered by the farmers' education status and level, acquisition of formal education by many rural farmers is an indication that they will quickly understand and make appropriate use of agricultural information on new farming techniques (Sanusi, Oyedeji and Akerele, 2017).

Farmers also need to be aware and utilise relevant agricultural information on funding to improve production. Studies show that the range of productivity of small scale farmers in Nigeria is between 1-10 hectares and this may be because many of these farmers have limited access to credit facilities to expand (Mgbenka and Mbah, 2016). Aminu, Falola, Ayinde and Sanusi (2017) found that income was significantly determined by a large farm ownership. However, scholars like Idumah, Owombo, Ighodaro and Mangodo (2016) believe that farmers in Nigeria are poor not because of growing small scale, but because they lack capacity to utilise valuable information to enhance their productivity. Their awareness and utilisation of agricultural information can be improved through extension programmes.

Large volumes of agricultural information are disseminated through agriculture extension services in form of informal education or training that introduces farmers to new knowledge and technology that can boost their crop yield when properly utilised. Although social networks appear to be a persuasive source of information about new products and resources, governments in developing countries continue to rely on extension officers to communicate with farmers about new technologies (Kamau, Margret and Hilary, 2018). Scholars like Soyemi and Haliso (2015) argued that the provision of agricultural extension services by various governments enhanced the use of information by farmers to increase their farm size, access credit and inputs; increase production and revenue as well as reduce the rigors of farm work.

Since farmers out number available extension workers, a trickle-down effect had been adopted to share information to farmers in rural communities. It was assumed that through the training of a group of model contact-farmers, the agricultural information would be further shared with other farmers (Mgbenka and Mbah, 2016). Agricultural information was often shared through the training of a group of farmers whom are members of cooperative societies. Literature shows that the use of agricultural information by members of cooperative societies has contributed to improved productivity and livelihoods. Aminu, Falola, Ayinde and Sanusi (2017) indicated that income was significantly determined by membership of cooperative societies.

Today, agricultural information is widely disseminated with the aid of information and communication technology (Ayanwale, Fatunbi and Ojo, 2016). Extension services now reach many rural farmers as agricultural information is now shared using technology across various media platforms. Since, most of the farmers are residing in rural communities in different regions, agricultural information is made available in form of audio and video messages in their local languages. The acquisition of formal education by rural farmers is an indication that they will quickly understand and make appropriate use of agricultural information on new farming techniques (Sanusi, Oyedeji and Akerele, 2017) in areas such as fertilizer application, pest management and disease control that might be introduced to them.

Studies have shown that the use of agricultural information relating to improved technologies and management practices has contributed to improved productivity and livelihoods. For instance, agricultural information on improved technologies and management practices like plantain processing contributed to improved productivity and livelihoods (Aminu, Falola, Ayinde and Sanusi 2017; Ayanwale, Fatunbi and Ojo, 2016). Aminu, Falola, Ayinde and Sanusi (2017) examined the determinants of income from plantain value addition. It revealed that a decrease in cost of input of processing will increase income and vice versa. The study also revealed that frying to chips, slicing and sun-drying, frying to flour, roasting and frying to dodo were forms of plantain processing.

Methodology

The study used a cross-sectional survey research design. The population surveyed was drawn from the OGADEP list of farmers in Ikenne local government area of Ogun State. A four-stage sampling was used to select the study sample. At the first stage, cluster sampling was used to group the farmers according to the major crops cultivated. Purposive sampling was used in the second stage to select plantain because it was a common cultivated crop among the farmers. Plantain farming appeared attractive to the farmers because it can be cultivated along with other crops, requires relatively low inputs like fertilizer and labour. At the third stage, three rural communities; Ilishan, Irolu and Ijesha were purposely selected because these were notable plantain producing communities. At the fourth stage, a purposive sample of 250 plantain farmers were selected from OGADEP list of farmers in these communities. These plantain farmers were identified with the assistance of extension agents and key informant members. These farmers received informal training, and regular context specific information from extension agents. A questionnaire was used to collect data from the entire sample. The return rate was 99.2%. Data collected was coded and analysed with the aid of the IBM Statistical Product and Service Solution Version 21 to generate descriptive and inferential statistics. Descriptive statistics such as such as frequency count and percentage were used for demographics. Mean was used to test the level of income, level of awareness and level of utilisation of agricultural information. Inferential statistics from the linear regression model was used to test the influence of awareness of agricultural information on livelihood, the influence of utilisation of agricultural information on livelihood and the combined influence of awareness and utilisation of agricultural information on livelihood.

Results

Table 1 presents the demographic data of the responding plantain farmers in Ilishan, Irolu and Ijesha communities in Ikenne Local Government Area of Ogun State, Nigeria. It shows that 52.4% of the respondents were male and 47.6% were female. About 51% of the respondents were below the age of 45years. This implies that majority of these

respondents were within the youthful age. Also, majority of the respondents had formal education. The education spread of the respondents shows that 60.8% of them had educational level below the tertiary education. The table also shows that many plantain farmers in the communities operated at a small scale. Only 5.6% of the plantain farmers cultivated above nine hectares of farmland.

Table 1: Demographic data of respondents

Classification		Frequency	Percentage
Gender	Male	131	52.4
	Female	119	47.6
Age	25-34	69	27.6
	35-44	60	24
	45-54	57	22.8
	55+	64	25.6
Educational Level	Primary School	52	20.8
	Secondary School	60	24
	Technical Education	42	16.8
	Tertiary Education	66	26.4
	No Education	30	12
Size of farm (hectares)	Less than one	72	28.8
	One to three	68	27.2
	Three to six	55	22
	Six to nine	41	16.4
	Above nine	14	5.6

Research objective one: To find out the level of awareness of agricultural information from various sources among these plantain farmers

Table 2 shows the plantain farmers' level of awareness of agricultural information from various sources. From the table, the plantain farmers indicated a high level of awareness of agricultural information from important sources like schools, extension services, other farmers, newspaper, Banks, radio, friends, among others since these were above the criteria weighted mean score set for low level of awareness. On a rank order, the plantain farmers indicated a high level of awareness of agricultural information from extension services; extension posters; farmers and newspaper/magazines with equal mean scores of 2.60. Their next indication was schools with a mean score of 2.58. This was followed by banks, online/internet and family members with equal mean score of 2.52. The table also shows that other agricultural information sources like agricultural institutions, library, farmer cooperatives societies, Non-governmental organisations (NGOs), television, film show, extension posters, bulletin/newsletters and customers were above the criteria weighted mean score set for low level of awareness. This implies that the plantain farmers had some awareness of agricultural information from all the listed information sources.

Table 2: Plantain farmers' level of awareness of the listed sources of agricultural information

Sources of agricultural information		HL	ML	LL	Mean
Extension services		150	100	0	2.60
Agricultural institutions		135	8	107	2.11
Library		100	45	105	1.98
Farmer cooperative societies		137	12	101	2.14
Banks		150	80	20	2.52
Schools		172	50	28	2.58
Non-governmental organisations (NGOs)		114	45	91	2.09
Electronic sources	Radio	114	100	0	2.60
	Television	135	8	107	2.11
	Mobile phone	130	65	55	2.30
	Film shows	137	12	101	2.14
	Online/internet	150	80	20	2.52
Print sources	Newspapers or magazines	172	50	28	2.58
	Extension manuals	114	45	91	2.09
	Extension posters	150	100	0	2.60
	Bulletin/newsletters	135	8	107	2.11
	Government circulars	80	65	105	1.90
Other farmers		150	100	0	2.60
Village heads		135	8	107	2.11
Customers		100	65	85	2.06
Friends		147	32	71	2.30
Family members		150	80	20	2.52

Key: HL= High level; ML= Moderate level; LL= Low level.
Criteria weighted mean score for low level of awareness is 1.00 on a scale of 3.0.

Research objective two: To find out the level of utilisation of agricultural information among these plantain farmers

Table 3 shows the level of utilisation of agricultural information by the plantain farmers. From the table, the level of utilisation of agricultural information for choosing good soil for planting, selecting good sucker for planting, treating sucker, measuring planting space and depth, fertilizer application, diseases and pest control, harvesting, storage and buying suckers as well as selling bunches/suckers/other products were high since these were above the criteria weighted mean score set for low level of utilisation. On a rank order, the plantain farmers indicated the highest level of utilisation of agricultural information for both choosing good soil and selling bunches/sucker/other products with a mean value of 2.60. These farmers indicated controlling diseases and pest next with a mean value of 2.58. On the other hand, the plantain farmers indicated a moderate level of utilisation of agricultural information for buying suckers with mean value of 1.98. This implies that the plantain farmers utilise less agricultural information for buying suckers compared to other uses.

Table 3: Plantain farmers' level of utilisation of agricultural information

Utilisation of agricultural information for	HL	ML	LL	Mean
choosing good soil for planting	150	100	0	2.60
selecting good sucker for planting	155	14	81	2.30
treating plantain suckers	120	45	85	2.14
measuring planting depth and spacing	137	12	101	2.14
applying fertilizer and manure	150	80	20	2.52
controlling diseases and pests	172	50	28	2.58
harvesting bunches	114	45	91	2.09
storing of bunches	135	8	107	2.11
buying suckers	100	45	105	1.98
selling bunches/suckers/other products	150	99	1	2.60

Key: HL= High level; ML= Moderate level; LL= Low level.
Criteria weighted mean score for low level of utilisation is 1.00 on a scale of 3.0.

Research objective three: To find out the level of income from various sources among the plantain farmers

Table 4 shows the level of income from various sources among the plantain farmers. From the table, the plantain farmers indicated that they earned high level of income from wages/salary/pensions/other income, the sale of bunches, the sale of suckers/ other products and lease of farmland since these were above the criteria weighted mean score set for low level of income. The plantain farmers earned the highest level of income from the sale of suckers/ other products ranked with a mean value of 2.49. They also earn high level of income from the lease of farmland with a mean value of 2.44 and wages/ salary/pension/other income with a mean value of 2.23. However, the least level of income came from the sale of plantain bunches with a mean value of 2.14 which is above the criteria weighted mean score set for low level of income. This implies that the plantain farmers make less income from the sale of plantain bunches compared to other incomes sources.

Table 4: Plantain farmers' livelihood from various income sources

Source of income	HL	ML	LL	Mean
Wages/salary/pension/other income	135	38	77	2.23
sale of plantain bunches	120	45	85	2.14
sale of suckers/other products	150	87	27	2.49
lease of farmland	136	73	27	2.44

Key: HL= High level; ML= Moderate level; LL= Low level.
Criteria weighted mean score for low level of income source is 1.00 on a scale of 3.0.

Research hypothesis one: The awareness of agricultural information has no significant influence on the livelihood of these plantain farmers

Table 5 shows that the livelihood of plantain farmers is significantly predicted by their awareness of agricultural information sources ($F_{(1, 248)}$ =8172.176, p<0.05). The linear regression model demonstrates that the awareness of agricultural information sources could explain 97.1 % (R^2=0.971) variation in the livelihood of plantain farmers. In addition, their awareness of various agricultural information sources has a strong positive correlation coefficient (r=0.985) which suggests that when their awareness of various agricultural information sources were considered, the plantain farmers' livelihood significantly improved. This implies that any increase in the plantain farmers' awareness of various agricultural information sources will lead to a relative improvement of their livelihood. Therefore, the hypothesis stating that the awareness of agricultural information had no significant influence on the livelihood of these plantain farmers is rejected.

Table 5: Influence of the awareness of agricultural information on the livelihood of plantain farmers

Model		**Sum of Squares**	**DF**	**Mean Square**	**F**	**Sig.**
1	Regression	2223.038	1	2223.038	8172.176	**0.000[b]**
	Residual	67.462	248	0.272		
	Total	2290.500	249			

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	.016	.108		.145	0.885
	Awareness	.184	0.002	0.985	90.400	**0.000**

a. Dependent Variable: **Livelihood**
b. Independent variable: **Awareness**

R = 0.985, R Square = 0.971, Adjusted R Square = 0.970

Research hypothesis two: The utilisation of agricultural information has no significant influence on the livelihood of these plantain farmers

Table 6 shows that the livelihood of plantain farmers is significantly predicted by their utilisation of agricultural information ($F_{(1, 248)}$ =8622.914, p<0.05). The linear regression model demonstrates that the utilisation of agricultural information could explain 97.2 % (R^2=0.972) variation in the livelihood of farmers. In addition, the independent variable has a strong positive correlation coefficient (r=0.986) which suggests that when the utilisation of agricultural information is considered, the plantain farmers' livelihood would be significantly improved. This implies that an increase in the plantain farmers' utilisation of agricultural information will lead to a relative improvement of their livelihood. Therefore, the hypothesis stating that the utilisation of agricultural information has no significant influence on the livelihood of these plantain farmers is rejected.

Table 6: Influence of utilisation of agricultural information on the livelihood of plantain farmers

Model		Sum of Squares	DF	Mean Square	F	Sig.
1	Regression	2226.466	1	2226.466	8622.914	**0.000**[b]
	Residual	64.034	248	0.258		
	Total	2290.500	249			

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.068	.104		0.653	0.514
	Utilisation	.400	0.004	0.986	92.860	**0.000**

a. Dependent Variable: **Livelihood**
b. Independent variable: **Utilisation**

R= 0.986, R Square = 0.972, Adjusted R Square = 0.972

Research hypothesis three: The awareness and utilisation of agricultural information has no combined significant influence on the livelihood of these plantain farmers

Table 7 shows that the linear regression model could only explain 97.2 % (R^2=0.972) variation in the livelihood of plantain farmers. It predicted the dependent variable with F-ratio of 4365.519 indicating that together, awareness (0.319) and utilisation (0.667) of agricultural information significantly influenced the livelihood of plantain farmers. The joint contribution of both independent variables to the dependent variable is expressed ($F_{(2, 249)}$ = 4365.519, *Adj* R^2 = 0.972, p<0.05) which suggests that when the awareness and utilisation of agricultural information are considered, plantain farmers' livelihood would be significantly improved. This implies that an increase in the plantain farmers' awareness and utilisation of agricultural information will lead to a relative improvement of their livelihood. Therefore, the hypothesis stating that the awareness and utilisation of agricultural information has no combined significant influence on the livelihood of these plantain farmers is rejected.

Table 7: Combined influence of awareness and utilisation of agricultural information on the livelihood of plantain farmers

Model		Sum of Squares	DF	Mean Square	F	Sig.
1	Regression	2227.485	2	1113.742	4365.519	**0.000**[b]
	Residual	63.015	247	0.255		
	Total	2290.500	249			

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.042	.105		0.405	0.686
	Awareness	0.60	0.030	0.319	1.999	0.047
	Utilisation	0.271	0.065	0.667	4.175	**0.000**

a. Dependent variable: **Livelihood**
b. Independent variables: **Awareness and Utilisation**

R= 0.986; R Square = 0.972; Adjusted R Square = 0.972.

Discussion

Results of the demographic data revealed that there were more male respondents than female. Many of the respondents were below the age of 45years. Also, it showed that more than half of the total number of the respondents had the attended formal education ranging from secondary school and below. This corroborates with the finding of Ashaye et al (2017) on the education status of farmers. Many plantain farmers in the communities operated at a small scale. Only few plantain farmers cultivated nine and above hectares of farm because many of the farmers had limited access to credit facilities to expand corroborating the view of Mgbenka and Mbah (2016).

The first research objective was to find out the level of awareness of agricultural information from various sources among these plantain farmers. Among the various sources of agricultural information indicated by the plantain farmers, extension services; extension posters; farmers and newspaper/magazines were indicated as having the highest level of awareness with equal mean scores of 2.60. This was followed by schools with a mean score of 2.58 and banks, online/internet and family members with equal mean score of 2.52. The plantain farmers also indicated they had high level of awareness of agricultural information from agricultural institutions, library, farmer cooperatives societies, non-governmental organisations (NGOs), television, film show, extension posters, bulletin/ newsletters and customers were above the criteria weighted mean score set for low level of awareness. Studies have reported these as important agricultural information sources (Kamau, Margret and Hilary (2018); Soyemi and Haliso, 2015). The fact that they were conversant with technology based sources like television, radio, mobile phones and internet upholds the assumptions of Curras (1984). These plantain farmers indicated that their level of awareness of agricultural information from libraries and government circulars was moderate. This implies that there was some level of awareness of all the listed information sources. Thus, there is need to improve the awareness of these and other agricultural information sources among farmers in these rural communities so as to relatively improve their productivity.

The second research objective was to find out the level of utilisation of agricultural information by the plantain farmers. Choosing good soil for planting and selling bunches/suckers/other products ranked first, controlling diseases and pests second and applying fertilizer and manure ranked third among the plantain farmers' level of utilisation of agricultural information. The plantain farmers also indicated a high level of utilisation of agricultural information for selecting good sucker plants, measuring planting depth and spacing, harvesting and storing bunches as well as buying sucker/other products since the mean scores were above the criteria weighted mean score set for low level of utilisation. This implies that plantain farmers no longer see digging for planting new suckers and mulching of new planted suckers as well as harvesting bunches as energy demanding (Ashaye et al, 2017). This level of utilisation of agricultural information could be responsible for the reduction in diseases, erosion and storage issues faced by these plantain farmers.

The third research objective was to find out the level of income from various sources among these plantain farmers. The findings show that the level of income from the sale of suckers/other products was the highest as indicated by the mean score. This implies that these plantain farmers earned highest incomes from the sale of suckers and other plantain products. Aside the sale of suckers, plantain farmers now earn income from processing plantain to products such as frying to chips, slicing and sun-drying, frying to flour, roasting and frying to dodo (Aminu, Falola, Ayinde and Sanusi, 2017; Ayanwale, Fatunbi and Ojo, 2016). It can also be seen in the findings that the plantain farmers earned a high level of income from the lease of farmland and wages/salary/pension/other income than from the sale of plantain bunches. The level of income earned by the plantain farmers from the sale of plantain bunches was above the criteria weighted mean score set for low level of income. This implies that the plantain farmers earned the highest income from the sale of suckers/other products and the least income from the sale of plantain bunches.

The first research hypothesis states that the awareness of agricultural information has no significant influence on the livelihood of the plantain farmers. The findings show that awareness of agricultural information had a significant influence

on the livelihood of the plantain farmers (r=0.985). Among the known conditions for improving agriculture is creating awareness of the existence of relevant agricultural information on modern practices. The result shows that the plantain farmers relied on extension services, extension posters, banks, schools, radio, newspapers, fellow farmers, friends and other listed sources for information. Studies show that the provision of agricultural information through extension services could enhance farmers' understanding and application of agricultural innovations acquired from various sources for the purpose of farming (Kamau, Margret and Hillary, 2018: Soyemi and Haliso, 2015). This could be because many farmers face difficulty in personally understanding and applying agricultural information on modern practices from other listed sources due to their level of education. Ayanwale, Fatunobi and Ojo, (2016) point out that communicating ideas, innovations and techniques to farmers through any appropriate medium could improve their productivity as well as livelihoods. Thus, an increase in the plantain farmers' awareness of agricultural information sources will lead to relative improvements in their livelihoods.

The second research hypothesis states that the awareness of agricultural information has no significant influence on the livelihood of the plantain farmers. The finding showed that the utilisation of agricultural information had a significant influence on the livelihood of plantain farmers (r=0.986). This implies that an increase in the plantain farmers' utilisation of agricultural information will lead to a relative improvement of their livelihood. Unfortunately, some farmers still lack the capacity to personally utilise valuable information to enhance productivity (Idumah, Owombo, Ighodaro and Mangodo, 2016). A farmer's inability to personally utilise agricultural information is a major hindrance that is attributable to low education level. However, the findings corroborated studies like Sanusi, Oyedeji and Akerele (2017) that the farmers have an opportunity to understand and utilise some of the agricultural information that might be introduced to them with the formal education acquired. Studies also pointed out that the utilisation of agricultural information provided by extension services encourages farmers to increase their farm size, access credit, inputs for production and revenue as well as reduce the rigors of farm work (Soyemi and Haliso, 2015: Mgbenka and Mbah, 2016).

The third research hypothesis states that the awareness and utilisation of agricultural information has no combined significant influence on the livelihood of the plantain farmers. The finding showed that the awareness and utilisation of agricultural information had a significant influence on the livelihood of the plantain farmers ($F_{(2,249)} = 4365.519$, $Adj\ R^2 = 0.972$, $p<0.05$). This implies that an increase in the plantain farmers' awareness and utilisation of agricultural information will lead to a relative improvement of their livelihood. The plantain farmers' awareness and utilisation of agricultural information depends on their understanding, extracting as well as appropriately applying information acquired from various information resources. The awareness of agricultural information gives farmers the capacity to make informed decisions to increase their farm size, access credit and inputs or production and revenue as well as reduce the rigors of farm work. It also provides knowledge about production, processing, transportation and other marketing dimensions of agriculture (Ayawale, Fatunobi and Ojo, 2016; 2018). Thus, it can be stated that awareness and utilisation of agricultural information had a combined significant influence on the livelihoods of these plantain farmers.

Conclusion and recommendations

Awareness and utilisation of agricultural information are necessary to not only to improve the productivity alone but also the livelihood of plantain farmers in Ilishan, Irolu and Ijesha communities in Ikenne Local Government Area of Ogun State, Nigeria. The plantain farmers had good understanding of agricultural information acquired from the listed sources like schools, extension services, other farmers and newspapers/magazines among others. This was as a result of the improved level of awareness of agricultural information from the listed sources by the plantain farmers. The utilisation of agricultural information in controlling diseases and pests, choosing good soil for planting and selling bunches/suckers/other products was high. Furthermore, awareness and utilisation of agricultural information jointly influenced the livelihood of plantain farmers. Based on these findings, efforts should be made to take into cognisance the peculiarity of each

farmer when providing extension services to improve the understanding and utilisation of agricultural information as this will lead to a relative improvement of their livelihood.

Implications of the Study

Findings from this study imply that the livelihood of plantain farmers improves when they are aware and utilise agricultural information. Plantain farmers' awareness and utilisation of agricultural information depend on their ability to identify, access, understand and extract as well as appropriately apply information acquired from information sources like books, posters, internet, TV and radio programmes, and several other sources for the purpose of farming. Utilisation of the right agricultural information at the right time would give the plantain farmers the capacity to make informed decisions that would improve their livelihoods.

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Supervision Practices in Library and Information Science Postgraduate Research in Nigeria and South Africa

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Abstract

In this study, supervision practices in library and information science departments in Nigeria and South Africa were examined. The sample framework consisted of master's dissertations and doctoral theses, completed from 2009 to 2015, which were available in the Directory of Open Access Repositories. Qualitative content analysis was used to generate the data used for the study. The data was presented in tables. The main findings showed that the majority of the theses and dissertations were sole-supervised. Co-supervision was more prevalent in dissertations than in theses. The major subject areas of the co-supervised theses and dissertations were information sources/studies and user services; while the major subject areas for sole supervised theses and dissertations were user services, records/knowledge management and information sources/studies. A few master's degree holders worked together as co-supervisors, but most co-supervision involved collaboration between professors and doctorate holders. In contrast to sole supervision, co-supervision is recommended because it provides an opportunity to share knowledge and learn by doing while enhancing the learning and research experience of students.

Keywords: *Supervision Practices, Co-Supervision, Sole Supervision, Postgraduate Research,*

Introduction

The supervision of students' research is of interest and concern to decision-makers at universities because supervision is related to the successful outcome of students and it enhances the reputation of the institution (Vilkinas, 2008). Proper supervision is essential to ensure the production of high-standard output. Good supervision is a factor in the successful and timely completion of postgraduate studies (Aina, 2015; Tahir, Ghani, Atek and Manaf, 2012). Inadequate supervision plays a role in the non-completion of research work and students' motivation (Haksever and Manisali, 2000; Olmos-López and Sunderland, 2017). This could account for the efforts and programmes mapped out in various institutions to ensure that the supervisors keep abreast with supervision trends. Moreover, the quality of postgraduate research output is as good as the supervisor who guides the research process (Stewart, 2018). It is the basic duty of the supervisor to teach the student how to plan and conduct original research (Ngulube, 2005). The postgraduate research work may be supervised by only one mentor or co-supervised, depending on the institutional arrangements and availability of supervisors. Sole supervision is when a single supervisor is officially assigned to supervise a student from the beginning to the completion of the work.

The literature reviewed showed that sole supervision was the traditional practice in many countries and disciplines. For instance, doctoral

education in universities in Europe follows the tradition of individual supervision (Dysthe, Samara and Westrheim, 2006; Lahenius and Ikävalko, 2014). In Canada, sole supervision of doctoral students has been the norm, while co-supervision has been used mainly to assist academics who are starting out in developing their supervisory skills (Paul, Olson and Gul, 2014). Universities in Africa are not an exception to sole supervision. Individual supervision is still prevalent in doctoral education in South Africa, where the British model of supervision is still followed (Backhouse, 2010; Dietz, Jansen and Wadee, 2006; Ngulube and Ukwoma, 2019). In Nigeria, Aina (2015) notes that most (80%) of the library and information science (LIS) projects were supervised by a single supervisor.

Several studies have outlined the challenges encountered in supervision, such as low completion rates (Agu and Odimegwu, 2014; Aina, 2015; Dysthe, 2002). Although co-supervision may have some disadvantages such as the cost of paying the supervisors, the two supervisors arriving at a conclusion when there are divergent views, variation in practice (Chiappetta-Swanson and Watt, 2011), and unclear responsibilities and roles (Zou and Kong, 2019), co-supervision adds knowledge and expertise to the supervisory work (Paul, Olson and Gul, 2014). The complexity of supervision makes the practice of joint supervision or co-supervision necessary to ensure the production of quality doctoral education (Halse and Malfroy, 2010).

In fact, there has been a global trend away from sole supervision to co-supervision, especially for doctoral degrees (King, 2016; Ngulube and Ukwoma, 2019). The shift to co-supervision is necessary considering the increasingly interdisciplinary nature of doctoral programmes, continuing knowledge specialisation and institutional quality assurance requirements (Guerin and Green, 2015). Co-supervision is when two supervisors are assigned to mentor their supervisee until completion of the research task. It involves two or more academics who work collaboratively or jointly to support the strength and abilities of the supervisee (Coulton and Krimmer, 2005). They work together from the beginning to the completion of the work (Paul, Olson and Gul, 2014) in order to facilitate the student's progress (Olmos-López and Sunderland, 2017).

Some countries have changed from the traditional British model to co-supervision in order to generate new knowledge and skills and to encourage interdisciplinary research (Ngulube and Ukwoma, 2019). For instance, the University of Bergen in Norway shifted away from the reliance on only one supervisor to group supervision (Dysthe Samara and Westrheim, 2006). In 2009, the four-year doctoral programme at Stockholm University in Sweden moved away from individual supervision to collective supervision in the first year (Agné and Mörkenstam, 2018).

Moreover, the University of the Witwatersrand in South Africa conducted a study on the effective implementation of co-supervision in the Faculty of Health Sciences and made suggestions for the development of accountable co-supervisory practices (Grossman and Crowther, 2015). Even in professions such as fashion, Yujie et al (2019) states the benefits of co-supervision. That implies that many professions have come to appreciate the benefits of co-supervision. The question is: What are the supervision practices of LIS researchers, for instance, in Nigeria and South Africa?

Examining the situation in Nigeria and South Africa regarding supervision practices will contribute to understanding supervision trends in a specific context and subject discipline. Nigeria and South Africa have made significant contributions to the development of LIS programmes in sub-Saharan Africa (Aina, 1994; Ocholla, 2000; Ranasinghe, 2007). South Africa and Nigeria were chosen for this study because of their prominence in the development of the LIS profession and they were among the earliest countries with LIS programmes (Ocholla, 2000). For this study, a dissertation is defined as a research report submitted for the award of a master's degree in LIS; while a thesis is a research report submitted for the award of a doctorate in LIS.

Problem Statement

Supervision practices are fundamental to the completion of postgraduate studies. Although sole supervision seems to be dominant, as demonstrated by the literature reviewed in the previous sections, many institutions and countries advocate co-supervision (Coulton and Krimmer, 2005; Dysthe Samara and Westrheim, 2006; Guerin and Green,

2015; Olmos-López and Sunderland, 2017; Agné and Mörkenstam, 2018). However, little is known about supervision of LIS postgraduate research in South Africa and Nigeria. Studies by Backhouse (2010), Dietz, Jansen and Wadee (2006), and Grossman and Crowther (2015) on supervision in South Africa did not examine the theses and dissertations of postgraduate students as they used a different methodology to the one used in this study. However, studies on postgraduate supervision in Nigeria by Agu and Odimegwu (2014) looked at the evaluation of models in doctoral supervision. Agu and Oluwatayo (2013) and Aina (2015) also examined some factors contributing to the delay in theses completion. Aina (2017) investigated supervisors' perceptions of the LIS doctoral programme. Duze (2010) analysed some problems encountered by postgraduates at universities in Nigeria. Ngulube and Ukwoma (2019) investigated supervision patterns without throwing sufficient light on co-supervision practices; they used only PhD theses. To the best of the researchers' knowledge, no study has looked at the supervision practices in Nigeria and South Africa using master's and doctoral research outputs in LIS.

This article concerns the study on the supervision practices of LIS theses and dissertations at universities in Nigeria and South Africa that were accessible online at the time when the data were collected. The specific research questions were:

1 What are the supervision patterns in LIS theses and dissertations at the universities under study?

2 Which supervision models are prevalent in LIS theses and dissertations at the universities under study?

3 What are the academic qualifications of the postgraduate supervisors of LIS theses and dissertations at the universities under study?

4 Is there a difference in the subject coverage of the co-supervised and sole supervised LIS theses and dissertations at the universities under study?

Literature Review

Research-intensive universities have focused increasingly on enriching supervisory excellence as a tool to enhance research students' publication activity (Nultya, Kileyb and Meyers, 2008). Consequently, the trend is towards co-supervision than sole supervision. Frame and Allen (2002) noted that co-supervision gives students an opportunity to express their opinion and encourages teamwork and division of labour between the supervisors. In co-supervision there is more transparent and visible form of supervision (Olmos-López and Sunderland, 2017), it works best when it is student-centred (Li and Seale, 2007; Paul, Olson and Gul, 2014). It reduces the time to completion of theses and facilitates acculturation (Agné and Mörkenstam, 2018). It gives more contact with a wider professional network and richer discussion with a wider perspective (Zou and Kong, 2019).

Sometimes the nature of the research involved may be a determining factor for the form of supervision. Postgraduate supervision is not a single activity that is done in the same way every time. What works in one situation may work less successfully in another (Nultya, Kileyb and Meyers, 2008). In the natural sciences, co-supervision is more common than in the humanities (Backhouse, 2010; Grossman and Crowther, 2015). Pole (1998) interviewed 300 PhD students from six disciplines at 18 universities in the United Kingdom and confirmed that co-supervision was more common in the natural sciences and engineering sciences than in the arts and social sciences. Spoon-Lane et al (2007) confirmed that co-supervision was rare in the social sciences and sole supervision was common. This may be because of the kind of research and experiments conducted in the natural sciences and engineering. For instance, some experiments focus on the development of theories and models and designing machines/tools which require the contributions of experts in the different subject areas. Although it is confirmed in some literature, a lot depends on the policy of the institution. Cornér, Löfström and Pyhältö (2017) state that in Finland the policy for doctoral education in many universities stipulates at least two supervisors, with at least one supervisor having the minimum qualification of being an associate professor in the relevant field. This may not be the situation in other universities. Grant, Hackney and Edgar (2014) are of the opinion that supervision practices are not simply prescribed by institutional policies, but that research supervision is fluid and determined by

continuity and change. Therefore, in some cases, what is set out in institutional policy is not necessarily adhered to in practice nor is it even widely consulted by academic staff (Tinkler and Jackson, 2000).

Grossman and Crowther (2015) state that good co-supervision practices should first involve a novice. Moreover, those with a PhD must start by supervising master's students before attempting to supervise PhD students. Some universities in Australia require that novice supervisors be accredited as principal supervisor after they have co-supervised a doctoral student's work from beginning to completion (Robertson and Fyffe, 2019). In the case of Spoon-Lane et al (2007), the associate supervisors worked as co-supervisors with their senior colleagues; only in rare cases did they assume the position of principal supervisor. The novice supervisors learned from the expertise of the experienced supervisors. In some cases, two senior colleagues might co-supervise, based on their areas of specialisation, with each contributing their experience to produce a better product. Manderson et al (2017) describes supervisors' relationships with their fellows as two-way relationships. Frame and Allen (2002) describe positively the value of a co-supervision policy in ensuring access to at least one senior researcher who is knowledgeable in the research field. Phillips and Pugh (1987) concur that co-supervision provides better support in the case of interdisciplinary research. Cross institutional co-supervision provides a valuable opportunity for networking (Manderson et al, 2017).

Co-supervision may often be a learning process of how to supervise (Robertson, 2017), as the associate supervisor learns from the principal supervisor or vice versa. This is emphasised in the work of Spooner-Lane et al (2007), where the narratives of the associate supervisors highlighted the pros and cons of co-supervision. For instance:

> The reflection on another's practice leading to one's professional development does not solely have to stem from exposure to 'good' practice; even exposure to poor supervision provides an insight into ways one might not practice as a supervisor (Spooner-Lane et al, 2007: 53).

However, the impact on supervision support which students receive may be negative. Co-supervision practices appear to have become prevalent after changes in the educational system regarding supervision (Frame and Allen, 2002; Dysthe, 2002; Spoon-Lane et al, 2007; Guerin and Green, 2015; Olmos-López and Sunderland, 2017). Backhouse (2010) notes that doctoral education varies between universities, faculties, countries and even supervisors. In the learning of algorithms, Kumar and Krishna (2015) observe that a teacher-alone strategy does not work well for future generations and that co-supervision is necessary. Also, in fashion generation, Yujie *et al* (2019) propose a neutral co-supervision learning framework. Lahenius and Ikävalko (2014) suggest that owing to the complex nature of doctoral education, studies on co-supervision in different disciplines and countries would provide a better understanding of this topic. This study investigated supervision practices in the LIS discipline in South Africa and Nigeria. The findings of this study will contribute to existing literature on supervision practices and underscore the important role that supervision plays in the production of postgraduate student work.

The interdisciplinary nature of LIS (between library science and information science) has given rise to many subject areas. Sugimoto et al (2011) highlight some dominant themes in LIS as information seeking, use, access, organisation and retrieval; and the education and training of the professionals providing these services. Other subject areas covered in LIS theses as identified by Mutula and Majinje (2017) are artificial intelligence, library automation, institutional repositories, scholarly publishing and business intelligence. The diversity of subjects and the emerging fields in LIS put supervision practices in the spotlight considering that there might be varying degrees of expertise which may not reside in one academic.

Methodology

Qualitative content analysis of postgraduate theses and dissertations was adopted to generate the quantitative data used in this study. The qualitative methodology is subjective and it is rooted in the epistemology of interpretivism (Creswell and Creswell, 2018). Content analysis is a method of

analysing documents that may be used for qualitative and quantitative data (Elo and Kyngas, 2008). The choice of the qualitative approach was dictated by the nature of the data, which had to be categorised first before any analysis could be conducted. This study followed the line of previous studies on content analysis in measuring scholarly communication.

The study population consisted of master's and doctoral research output completed between 2009 and 2015 at universities in Nigeria and South Africa. Although, there are 25 accredited LIS schools in Nigeria (Librarian Registration Council of Nigeria, 2018), only the LIS schools with a footprint in institutional repositories (archives of theses and dissertations, articles and grey literature) were selected. *The Directory of Open Access Repositories* (DOAR, n.d.), which is an open access registry that captures institutional repositories in the world, was selected in line with previous studies. It is a quality-assured global directory of academic open access repositories that enables identification and browsing for repositories. However, it provides information to repositories that fully embrace the concept of open access to their content (Bashir, Mir and Sofi, 2019). It gives an up-to-date snapshot of the worldwide academic repositories landscape (Pinfield *et al,* 2014).

The University of Ibadan (UI), University of llorin, University of Nigeria, Federal University of Technology Minna, and Ahmadu Bello University Zaria (ABU) were potentially suitable for inclusion in the study, as they all deposited materials into DOAR. Nevertheless, the study was limited to the University of Nigeria Nsukka (UNN), UI and ABU. The University of Ilorin was excluded because it only uploaded research articles and not theses and dissertations, and the Federal University of Technology Minna was omitted because it only uploaded abstracts of undergraduate projects at the time of the study (March 2019). UI, the University of Nigeria and ABU were ranked first, second and third respectively in the production of postgraduate research outputs (Otubelu, 2010). Though UI ranked first in the production of postgraduate research output, few theses and dissertations were uploaded in their institutional repositories and the majority of the records in the repository were journal articles, as captured in DOAR at the time of this study. This affected the number of records used for this study. We do not claim that this is a representative study considering the number of theses and dissertations available online, but the few copies available showed similarity in the supervision pattern.

Although there are different opinions on the number of LIS schools in South Africa, the researchers worked with a sample of 10 LIS schools provided in recent studies (Maluleka and Onyancha, 2016; Ngulube and Ukwoma, 2019). The ten university repositories that were captured in the DOAR and formed the sample frame were Durban University of Technology (DUT), University of Cape Town (UCT), University of Fort Hare (UniF), University of Johannesburg (UJ), University of KwaZulu-Natal (UKZN), University of Limpopo (UL), University of Pretoria (UP), University of the Western Cape (UWC), University of South Africa (Unisa) and University of Zululand (UniZulu). It is noteworthy that the UWC did not deposit any theses and dissertations between 2009 and 2015, which meant that only nine universities were ultimately included in the sample for the study. This demonstrates that many sample frames have flaws, but that has not stopped researchers to conduct studies to establish the subjective and intersubjective essence of the phenomenon under investigation.

The researchers chose 2009 as the starting point because some of the repositories included in this study were launched in or before that period, for example Unisa in 2009, DUT in 2008, UP in 2006 and UniZulu in 2009 (DOAR, n.d.). The 2015 cut-off date for the analysis is within the range recommended for determining the changing patterns in scholarly communication (Stansbury, 2002).

The theses and dissertations were downloaded from the repositories of the universities being studied, and this took three weeks. The datasets were then cleaned and analysed manually, ensuring that the institution and completion date of the thesis or dissertation tallied with the scope of the study. The datasets that were downloaded but fell outside the scope of the study were discarded, leaving a total of 198 master's dissertations and PhD theses from South Africa and 202 from Nigeria, with a grand total of 400. Furthermore, they were arranged by year and subsequently by type of programme (master's or PhD) before extracting the required information on patterns of supervision. To ascertain if a work was co-supervised, the names of the supervisors had

to appear on the title page as supervisors of the work and then be acknowledged by the student on the acknowledgement page. The subject area of the master's or doctoral research output was extracted from the abstract and title pages of the work. The academic status of the supervisors was also extracted from the title page because the titles of the supervisors were available on that page. Thereafter, the coded data were entered on Excel (Microsoft® Excel ver. 10.0). To ensure reliability and validity, a sample of theses was coded by the second author but there were no significant variations. The results were presented using frequency, percentages and tables.

Findings

Table 1: Supervision patterns of LIS in Nigeria and South Africa

Country	Institution	Total number of theses and dissertations	Total number of dissertations (master's) f (%)	Total number of theses (PhD) f (%)	Number of sole-supervised theses and dissertations f (%)	Number of co-supervised theses and dissertations f (%)
Nigeria	Ahmadu Bello University, Zaria (ABU)	60	54 (19.0)	6 (5.2)	2 (0.7)	58 (47.2)
	University of Nigeria, Nsukka (UNN)	135	106 (37.3)	29 (25)	134(48.4)	1 (0.8)
	University of Ibadan (UI)	7	-	7 (6.0)	7 (2.5)	-
South Africa	Durban University of Technology (DUT)	5	3 (1.0)	2(1.7)	3 (1.1)	2(1.6)
	University of Fort Hare (UniF)	9	8(2.8)	1 (0.9)	9 (3.2)	-
	University of Limpopo (UL)	1	1(0.4)	-	1(0.4)	-
	University of Cape Town (UCT)	18	17(6.0)	1(0.9)	16(5.8)	2(1.6)
	University of Johannesburg (UJ)	18	13(4.6)	5(4.3)	15 (5.4)	3 (2.4)
	University of KwaZulu-Natal (UKZN)	45	21(7.4)	24 (20.7)	33 (11.9)	12(10)
	University of South Africa (Unisa)	31	14(4.9)	17 (14.6)	17 (6.1)	14 (11.3)
	University of Pretoria (UP)	51	38 (13.4)	13 (11.2)	35 (12.6)	16 (13.0)
	University of Zululand (UniZulu)	20	9 (3.2)	11 (9.5)	5 (1.8)	15 (12.1)
	Total	**400**	**284**	**116**	**277**	**123**

The supervision patterns of LIS theses and dissertations in Nigeria and South Africa, as shown in Table 1, revealed that they practised both sole supervision and co-supervision. Of the 400 theses and dissertations produced within the period, 69.3% was sole supervised and 30.7% was co-supervised. Furthermore, 143 of the theses and dissertations were sole supervised in Nigeria, and 134 were sole supervised in LIS schools in South Africa. While 59 theses and dissertations were co-supervised in Nigeria, 64 were co-supervised in South Africa. There is similarity in their supervision patterns.

Table 2: Supervision model that is Prevalent in LIS theses and dissertations

Country	Institution	Total number of co-supervised theses and dissertations	Number of co-supervised dissertations (master's)	Number of co-supervised theses (PhD)	Number of sole supervised theses and dissertations	Number of sole-supervised dissertations (master's)	Number of sole-supervised theses (PhD)
Nigeria	ABU	58	53 (59.6)	5 (14.7)	2	1(0.5)	1(1.2)
	UNN	1	1(1.1)	-	134	105(53.8)	29(35.4)
	UI	-	-		7	-	7(8.5)
South Africa	DUT	2	1 (1.1)	1(2.9)	3	2 (1.0)	1(1.2)
	UniF	-	-	-	9	8(4.1)	1(1.2)
	UL	-	-	-	1	1(0.5)	-
	UCT	2	2 (2.2)	-	16	15 (7.7)	1(1.2)
	UJ	3	1(1.1)	2(5.9)	15	12(6.2)	3(3.7)
	UKZN	12	4 (4.5)	8 (23.5)	33	17(8.7)	16(19.5)
	Unisa	14	9 (10.1)	5 (14.7)	17	5(2.6)	12(14.6)
	UP	16	12 (13.5)	4 (11.8)	35	26(13.3)	9(11)
	UniZulu	15	6 (6.7)	9 (26.5)	5	3(1.5)	2(2.4)
	Total	**123**	**89**	**34**	**277**	**195**	**82**

Table 2 indicates that sole supervision was most prevalent in the two counties, as shown by the number of theses and dissertations that were sole supervised in Nigeria (143) and South Africa (134). Of the 277 theses and dissertations that were sole supervised, 70.4% was master's dissertations and 29.6% was doctoral theses. Similarly, co-supervision was more prevalent for dissertations (72.4%) than for theses (27.6%). Furthermore, the breakdown of the supervision practice among the universities shows that sole supervision was more prevalent at UNN, UP and UKZN; while co-supervision was more prevalent at ABU, UP and UniZulu. In terms of sole-supervised dissertations, UNN (53.8%) recorded the highest percentage, followed by UP (13.3%); for theses, UNN (35.4%) also had the highest percentage, followed by UKZN (19.5%). In terms of the co-supervised dissertations, ABU had the highest percentage (59.6%), followed by UP (13.5%); UniZulu recorded the highest percentage (26.5%), followed by UKZN (23.5%), of co-supervised theses. In the universities where co-supervision was practiced, a professor co-supervised with another professor or with a doctorate holder. In a few instances, two master's degree holders co-supervised.

Table 3: Highest academic status of the supervisors

Country	Institution	Total number of supervisors	Professors	Doctorate degree holders	Master's degree holders
Nigeria	ABU	15	4	9	2
	UNN	14	4	10	-
	UI	5	3	2	-
South Africa	DUT	6	3	3	-
	UniF	2	1	1	-
	UL	1	-	-	1
	UCT	5	1	4	-
	UJ	9	5	4	-
	UKZN	12	5	3	4
	Unisa	16	10	2	4
	UP	21	10	7	4
	UniZulu	9	6	3	1
	Total	**115**	**52**	**48**	**15**

It is expected that for one to possess a doctorate degree, he/she must have obtained a master's degree. In this study, the researchers were concerned with the highest academic qualifications of the supervisors. Table 3 shows that only professors and doctorate degree holders were involved in supervision at UCT, DUT, UF, UJ, UniZulu, UI and UNN. At UKZN, Unisa, UP and ABU, there were three categories of supervisors, namely: professors, doctorate holders and master's degree holders. In the case of UL, where the supervisor was a master's degree holder, the question may arise of who served as that supervisor's mentor. From the data collected from UL, it was not easy to ascertain the number of supervisors in the department in order to determine if other supervisors at the level of professor or doctorate holder were available within the period in question.

Table 4: Sole-supervised theses and dissertations and their subject areas

	Major subject area	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**Total**
Nigeria	Bibliometrics, scientometrics and informetrics		1					1	2
	Collection development-preservation		2	3	1		2	2	10
	E-governance/E-learning						1	1	2
	Information sources/studies		1	1	5	4	7	6	24
	Information and communication technology	3	2	2	6	2	2	4	21
	Records/Knowledge management					1		2	3
	Libraries	1			1	2			4
	Library education and curriculum					1		2	3
	Library management	2	2	3	7	1	1	2	18
	LIS profession/professional	2			1				3
	Scholarly communication		4	2		2	3	4	15
	User services		4	8	7	10	5	4	38
South Africa	Bibliometrics, scientometrics and informetrics	1	1			1	1	2	6
	Collection development-preservation/Technical services		1						1
	Competitive intelligence				1		1		2
	Design and innovations					2	1		3
	E-governance/E-learning			1				2	3
	Information and communication technology				1	1	4	5	11
	Scholarly communication	3		2		2	4	5	16
	Information sources/studies	1	2	1	3	9	1	3	20
	Knowledge/Records management	2	2	5	3	2	3	11	28
	Libraries			1			2	1	4
	Library education and curriculum							2	2
	Library management	2				1	3		6
	Quality assurance			1		1			2
	User services			2	5	6	5	10	28
	LIS profession and professionals		1					1	2

Table 4 shows the different major subject areas and the number of theses and dissertations produced in those subject areas within the study period. On the subject areas of the sole supervised theses and dissertations in Nigeria, a number of subject areas were supervised but the greater number was in user services, information sources and studies, library management, and information and communication technology. Subject areas like bibliometrics, scientometrics and informetrics, e-governance and e-learning recorded only two theses and dissertations each. In South Africa, most of the theses and dissertations covered user services, knowledge and records management, information sources/studies and scholarly communication. Subject areas like collection development-preservation/technical services had one thesis. While library education and curriculum, LIS profession and professionals, and competitive intelligence had two theses and dissertations each within the study period.

Table 5: Co-supervised theses and dissertations and their subject areas

	Major subject area	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**Total**
Nigeria	Bibliometrics, scientometrics and informetrics							2	2
	Collection development-preservation			2					2
	Information sources/studies		2	3		1	7	6	19
	Information and communication technology			1	1		4	7	13
	Records/Knowledge management					1	1	1	3
	Libraries						1	2	3
	Library education and curriculum						1		1
	Library management	1		2			1	1	5
	Scholarly communication							1	1
	User services			2	2		1	5	10
South Africa	Bibliometrics, scientometrics and informetric			1	1			1	3
	Collection development-preservation/Technical services				2			1	3
	Competitive intelligence	1							1
	Design and innovations	1					2		3
	E-governance/E-learning	1		1	1	1	1	1	6
	Information and communication technology	1	1		2	3	1	2	10
	Scholarly communication				3				3
	Information sources/studies	2			1	3	2		8
	Knowledge/Records management	2	1	1	2	2			8
	Libraries						1	1	2
	Library management		1				1		2
	Quality assurance				1				1
	User services	2	1	3		3	5		14

The major subject areas of the co-supervised theses and dissertations, as presented in Table 5, were information sources/studies (both print and electronic) and information and communication technology. Otubelu (2010) also found that information resources were among the three core researched areas in LIS postgraduate research in Nigeria. In South Africa, the major subject areas of co-supervised theses and dissertations were user services and information and communication technology.

Discussion

The findings show that sole and co-supervision were practised in the supervision of theses and dissertations in the two countries. A limited number of theses and dissertations in Nigeria and South Africa were co-supervised. Sole supervision was prevalent in the two countries and in most of the universities, except in ABU, UP and UniZulu where co-supervision was more prevalent. This could be attributed to the fact that sole supervision was the traditional practice in many countries and disciplines (Dysthe, Samara and Westrheim, 2006; Lahenius and Ikävalko, 2014).

With the changing trends in research and the realisation of the benefits of co-supervision, as outlined by Coulton and Krimmer (2005), Paul, Olson and Gul (2014), Olmos-López and Sunderland (2017) and Robertson and Fyffe (2019) co-supervision is recommended. Considering the complexity of supervision and the quest to produce quality doctoral education (Halse and Malfroy, 2010), embracing co-supervision may be helpful as Frame and Allen (2002) claim that co-supervision helps to ensure that students have access to at least one supervisor at any given time. Some may argue that the number of supervisors at an institution determines the supervision practices; however, Cornér, Löfström and Pyhältö (2017) are of the opinion that two supervisors should be involved in doctoral education. In most cases, there seems to be a discrepancy between policy and practices (Grant et al, 2014; Tinkler and Jackson, 2000). However, it is not possible to draw this conclusion from the data, since even some of the institutions with fewer supervisors practiced co-supervision. For instance, UP had the highest number of supervisors, followed by Unisa, ABU and UNN; whereas UniF, DUT and UniZulu had the least number of postgraduate supervisors. Nevertheless, UniZulu produced the second-highest number of co-supervised dissertations and the highest number of co-supervised theses.

Although the findings show that the practice of co-supervision by two master's degree holders was evident, master's degree holders should always co-supervise with a more experienced supervisor. Spoon-Lane *et al* (2007) and Robertson and Fyffe (2019) note that novice supervisors should learn from experienced supervisors before they may be allowed to practice the tools of the trade on their own. Even a professor or a doctorate holder can be a novice in certain subject areas. Nevertheless, if a senior colleague co-supervises with a less experienced one, it will provide an opportunity for the latter to learn (Frame and Allen, 2002; Robertson, 2017). Supervisors are assigned based on their subject areas. Therefore, two professors can co-supervise, depending on the input expected from each of them to improve the quality of the research work.

Information sources/studies was the major subject area with the highest number of co-supervised theses and dissertations in Nigeria, while user services was the subject area with the highest number of co-supervised theses and dissertations in South Africa. For sole supervised theses and dissertations, user services and information sources/studies recorded the highest number in Nigeria; while user services and knowledge/records management recorded the highest number in South Africa. This shows that the subject areas of both sole and co-supervised theses and dissertations were similar. This implies that the subject areas of theses and dissertations may not be a factor in determining the form of supervision. Ordinarily, one would expect differences in subject areas of sole and co-supervised theses and dissertations, as the nature of the research could determine the form of supervision. Yeap and Kiran (2008) identify information use, need, seeking information networks and academic libraries as major subject areas covered by LIS theses at the University of Malaysia. Library management and administration, followed by user studies, were major subject areas covered by LIS postgraduate research at the University of Nigeria, with a few studies in subject areas like bibliometrics and special libraries (Echezona, Okafor and Ukwoma, 2011). However,

the fact remains that their research areas should be broadened, instead of concentrating on a few subject areas. In circumstances where there are insufficient supervisors knowledgeable in a subject area, interdisciplinary co-supervision may become necessary if it is the only option. Two supervisors can contribute based on their different areas of expertise. For instance, one may be a specialist in the subject area of the study (content) while the other may be a specialist in design (methodology); by co-supervising, they may help a student produce quality research work.

Implications for Postgraduate Supervision

This study has implications for supervisors and research students in the two countries. As the LIS departments in the two countries have contributed to the development of LIS programmes in Africa, knowledge of the research activities in the departments will be beneficial to the discipline. Considering the benefits of co-supervision over sole supervision, as highlighted by extant literature (Spooner-Lane *et al*, 2007; Manderson *et al*, 2017; Olmos-López and Sunderland, 2017; Robertson, 2017; Zou and Kong, 2019), encouraging institutions to adopt co-supervision will enhance their research output and the supervision experienced by students.

Furthermore, LIS research areas should be broadened; the current trend in research is interdisciplinary collaboration, especially in some of the subject areas that are not purely library based, and other new subject areas in LIS. It is important to encourage interdepartmental/interfaculty co-supervision. Collaboration enhances knowledge sharing and exchange of ideas, with each person benefiting from the wealth of experience of others. This can be partly achieved through co-supervision.

Limitations and Further Research

Based on the findings of this study, a further study interviewing supervisors to determine the factors influencing supervision patterns in various universities is recommended. This will help to identify the reasons for the low rate of co-supervision. The other limitation was the sample framework. Some of the research outputs from UI were not in the DOAR at the time of this study. Access to more records from that university may deliver more insights into the conclusions made in this study.

Conclusion

Having examined the sole-supervised versus co-supervised master's and doctoral research output of students from LIS departments of universities in Nigeria and South Africa, the results show that co-supervision was not practised much in some of the universities studied in the two countries. These universities produced more master's dissertations than doctoral theses, except in the case of UniZulu, UKZN and Unisa, where the opposite was true. The supervision culture of the universities studied seems to be similar, as co-supervision was practised at some of these institutions (although it was practised more at ABU, UP and UniZulu). The academic status of the supervisors showed that mainly professors and doctorate holders were involved in the supervision of students. The subject areas of the sole and co-supervised dissertations and theses were similar, which implies that the LIS researchers in the two countries should broaden their research subject areas to capture subject areas which can produce new designs and innovations in the discipline.

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Determinants of Motivation and Job Satisfaction of Information Technology Artisans in Lagos, Nigeria

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Abstract

This study was designed to investigate how the Maslow's hierarchy of needs theory explains the rapid growth in IT artisanship in an IT cluster in Lagos Nigeria. Data was collected from 250 artisans in locations in Lagos in Nigeria using a questionnaire. The Maslow's variables predicted different motivation and job satisfaction variables differently just as do the demographic and social characteristics of the respondents. Despite the poor economic conditions in Nigeria, many IT artisans are located on basic needs, but majority are concentrated on safety need matters. Despite a further large number of respondents in the low socioeconomic threshold, self-esteem constructs predicted job satisfaction, except the wish to remain in the profession and perception about the future in the job; mastery of the job, a sense of achievement and a feeling of belonging to a high social class were related to adequacy of income. This study does not uphold Maslow's hierarchy of needs theory because the needs of the artisans do not manifest in any linear fashion –from the lowest to the highest as they would occur in Maslow's hierarchy of needs. The retention in the job and the satisfaction expressed by the artisans are definitely as a result of other factors, and not the conventional hierarchy of needs. This result shows that the IT clusters have great promises of committed and dedicated human resources whose labours would support emergence of an innovation hub.

Keywords: *Information Technology, Job Satisfaction, Motivation, IT Artisans, Lagos, Nigeria.*

Introduction

In the last five years, some studies have been carried out in Nigeria describing the emergence of information technology artisanship, and examining various aspects of their operations particularly in a popular technology cluster known as Otigba Computer Village in Lagos (Nwagwu and Ibeku 2016, Nwagwu 2018). These studies connect to formative studies on the Computer Village in Lagos Nigeria that focus mainly on the prospects of information technology businesses in the location as technology clusters or sites that hold the potential for information technology innovation progress in the country (Bamiro 2003, Oyelaran-Oyeyinka 2006, 2014). Earlier studies were optimistic about the opportunities the IT cluster present for information technology development in Nigeria, and dubbed the cluster Nigerian Silicon Valley, exactly as is the case in Cape Town and Nairobi IT clusters (Coban 2018). Generally, technologies represent and stimulate constellations of social and cultural values, as well as economic and other choices, and foster power geometries that are continuously evolving. Evidently, digital technologies conform to this shade; they are neither neutral nor are they hardwired and deterministic artefacts as they are bendable to respond to vagaries of local imperfections, eccentricities and practices. A major evidence of this reality is the sprawling of information technology artisans in Nigeria.

Artisans and artisanship are very popular service delivery strategies in many developing countries where professionals and expertise are constrained both in numbers and capacity. Basically, the IT artisans in Lagos have some knowledge about how to solve many IT problems, they can build personal computers from scratch, run some hardware and software tests and diagnoses, and provide some technical support. The IT artisans also provide services such as software programming, development of websites, and provision of Internet services. They have a variety of educational levels, from those that have formal education to those with no education at all. The IT artisans are generally characterised by having manual skills which they acquire through either formal or informal apprenticeship processes. The majority of them have a low threshold level of expertise, require minimal start-up capital, and have flexible working hours. They also have the choices of working at home and the freedom to manage their own businesses. The tasks of the IT artisans are sometimes complex and demanding – they face the challenge of keeping up with the complex and rapid changes in the field of information technology (Fang, Benamati and Lederer 2011). In conformity with what is known about artisanships businesses elsewhere (Kayanula and Quartey 2000; Smits and Stromback 2001), the artisans in Nigeria establish their offices and workshops in locations that vary from open spaces to temporary wooden structures, or at home, and they employ a few or in some cases no salaried workers, or they rely on family members and apprentices.

IT artisans constitute the major IT service providers in Nigeria (Oyelaran-Oyeyinka 2006, Nwagwu and Ibeku 2016). All over Nigeria, IT artisan businesses can be spotted in various locations – ranging from well-organised and established set-ups to shanty and roadside shops, providing services that cover mobile phones, computer hardware and software sales and services, and repairs and maintenance. A visit to Computer Village in Lagos shows that the business is dominated by males; females found in the locations provide daily needs services such as food and provisions while a few are involved in the sales of IT products. The IT artisan business is blossoming in major cities in Nigeria; they usually operate in clusters and they have a variety of social and other backgrounds.

Sites that have promise for science and technology innovation opportunities are often attractive to young people, the unemployed and the savvy. They also attract investors, foreign and local, and, governments. Typical example is the visit of the FaceBook proprietor, Mark Zuckerberg, to Nairobi startups in August 2016 to learn about M-Pesa and Ushahidi and other technologies. However, the tech savvy cluster in Lagos constantly engage between fulfilling the liberating feelings about new professional and work possibilities and the harsh and restrictive immediate and wider environment in which they work (Coban 2018). These engagements result to the reiterative processes of performing and producing in deûcient environments and the resultant futility to build technologies that have real social impact in Nigeria. Basically, major evidence of investment in the cluster is the importation of finished IT products as well as spare parts which serve the purpose of effecting repairs and refurbishing old and dysfunctional IT equipment. To this extent, Judith Butler's (2010) theory of performativity can be implored to argue that social entrepreneurship practices in the IT cluster in Lagos might be a mere attempt at reproduction of postcolonial imaginations. The artisans and the small scale outfits that drive the activities in the locations can be described as tech-deterministic, charitable and social-impact-driven agencies whose impact can only be measured by the capacity to meet basic needs, and a little bit more.

Literature on innovation sites in the Global South are scarce generally, and there is seldom any documented history of innovation. Existing studies conceptualise technology and innovation sites as a sort of countercultures because they are viewed as a mimic of the uppercase capitalist structures in the west (Sivek, 2011; Maxigas, 2012). As a result, majority of the literature on structure and function of innovation sites reûect the stories of the struggle in the Global South to practically embrace technology. Edgerton (2007) has referred to this struggle as consisting of "transfer, resistance, incompetence, lack of maintenance, and enforced dependence on rich-world technology" (p.4).

Bigelow (2012) conducted an employment survey of TechTarget employees in the United States and showed that at all levels; job satisfaction in the IT industry goes beyond dollars and cents, and that

stimulating work is the major reason why many IT workers stay in their jobs. Business aspects are side issues to the satisfaction of IT professionals in Bigelow's study; intellectual pursuits and technical growth opportunities are simply more interesting. According to the subjects he studied, "Despite long hours, tight budgets and steep technology learning curves, our employment survey shows it's the work challenges that keep IT pros happy (pp8)" might have said it all about job satisfaction of information technology professionals. He went further "IT folks want to solve problems, learn new technologies and then use those technologies to help the business succeed (pp9)." In another study, Lim (2008) showed that salary, a sense of belonging, faith in wanting to belong, a feeling of acceptance, job autonomy and promotion opportunities were related to job satisfaction of the library IT workers. The job environment also plays a huge role in IT job satisfaction and retention. Lim and Bigelow's studies focused on non-artisanship IT workers in the United States. How would artisanship IT workers in Nigeria weigh on a motivation and job satisfaction scale?

Besides, but emanating mainly from the perspectives of Maslow and others, many definitions about motivation exist (Whiseand and Rush 1988), but the recent definition by Saraswathi (2011) appears more informative: ¨ … the willingness to exert high levels of effort, toward organisational goals, conditioned by the effort's ability to satisfy some individual need. This definition aptly links motivation and job satisfaction¨ (p11). Job satisfaction results from the achievement of the goals that one expects through his or her job (Saleem, Mahmood and Mahmood, 2010). To a large extent, positive feelings signify job satisfaction while negative feelings suggest otherwise. Job satisfaction may be affective, that is, uni-dimensional and subjective occurring when it is necessary to represent an overall emotional feeling that individuals have about their job as a whole (Niehoff and Moorman 1993). It can also be cognitive in which case a more objective and logical evaluation of the various facets of a job is undertaken, and this is done over a spectrum of factors.

Statement of the Research Problem

There also exists empirical evidence that the artisans have low level of expectation, low achievement and low income (Nwagwu 2018). The Lagos IT business cluster has been described as a jungle (Gboneme 2012) where the good, the bad and the ugly obtain. Also, unlike Nairobi that is generally considered a technological innovation site (Coban 2018) that has nurtured two innovations that are internationally used namely Ushahidi, an open-source software with which everyone who has access to the Internet can map happenings, and M-Pesa, a mobile money application. Lagos cluster is mainly a hardware oriented type of cluster and no known software IT application has been associated with it yet. In a recent study by Nwagwu (2018), less than one fifth of the respondents reported that they would want to remain in the job, less than half reported being happy with their job. Only a few respondents have a feeling of dignity in their jobs, income was also reportedly very unsatisfactory, however, many considered their opportunity for growth as very high. One of the explanations is always the high level of unemployment in the country (Oyelaran-Oyeyinka 2006, World Bank 2013). The population of Nigeria is teaming, estimated at 200 million in 2013, with 46% poverty headcount ratio, and a poverty rate of 64.2% (National Bureau of Statistics 2013).

Most studies on the IT clusters in Lagos report blossoming business (Bamiro 2003; Oyelaran-Oyeyinka 2006, 2014). The large volume of old and new entrants, the expanding spread of the clusters, the increasing popularity of the trade, the capacity of the artisans to solve IT problems; among others, symbolise a profitable business expected in a learning and knowledge cluster. There is also the unsubstantiated myth that the business is highly profitable, a belief that constitutes a pull factor for young people. Besides these normative and intrinsic factors, there are the more socially situated factors such as IT profession being trendy and attractive to young people. The possible interdependency among the operators both on professional and daily sustenance matters could also act as attractive and stay-factors to young and early career practitioners.

Why have the low level of expectations such as exemplified by the low income earned by the practitioners not affected the influx of new entrants into the business? Why the do the artisans wish to retain and remain in the business that is not financially, and other, profitable? Abraham Maslow's theory of basic needs postulate that human beings endeavor

to meet their most basic needs, before they try to meet other needs which Maslow ranked higher in the his hierarchy of needs. This theory would favour a surmise that artisans in the IT cluster are people concentrated in the lowest level of Maslow's hierarchy of needs: food, shelter, sleep, clothes, health and homeostasis. Yet, adequate motional state of health, satisfaction with the outcome of the tasks undertaken, among others, are expected to be key to the resilience of the artisans in their professions.

The study focused on three broad research questions synthesised from the discussion so far to guide the study.

1. ***Research Question One:*** *Is there a significant relationship between the Maslow's motivation variables and retention, income and prospect among the artisans in Lagos Nigeria?*
2. ***Research Question Two:*** *Is there a significant relationship between the Maslow's motivation variables and perceived emotional feelings of the artisans towards their job?*
3. ***Research Question Three:*** *What is the relationship between the demographic characteristics of the artisans and the motivational variables?*

Addressing these questions will provide information to guide the government, policymakers and other stakeholders on how to support and develop the informal IT subsector to address the unemployment problem in Nigeria. The information will also be useful for ensuring that people engaged in informal IT services derive maximum satisfaction from their work. The decomposition of Maslow's hierarchy of needs variables as cognate variables groups that have non-linear relationship also makes this study theoretically relevant to researchers generally.

Theoretical Perspective

Maslow's Motivation and Extrinsic Job Satisfaction Perspectives: A Critique

Maslow's theory suggests that human beings are extrinsic in respect of motivation and satisfaction at work. Most studies on job satisfaction and motivation utilise the perspectives/theories of Hierarchy of Needs approach of Maslow (1954), while others use later perspectives such as the Herzberg's Motivator-Hygiene theory and the Job Characteristics Model, Affective Event theory (Thompson and Phua 2001), Equity Theory (Walster, Berscheid and Walster 1973) and Job Characteristics Theory.

Maslow's Theory of Needs

In several research efforts, Maslow (1943a, 1943b, 1954a, 1954b, 1970) developed and elaborated on the popular model of hierarchy of needs which has tremendously contributed in guiding the understanding of human motivation and personal development for many years. Although Maslow himself has further adjusted his original model (Maslow 1996), all the Maslow perspectives generally posit that everyone has needs, and that these needs explain people's actions and reactions. In other words, human needs motivate their actions. Motivation could be described as a driving force that makes people to willingly want to put in their best in what they do (Saleem, Mahmood and Mahmood 2010). It can also be viewed as an inner force that drives individuals to attain personal and organizational goals (Tasnim 2006, Louca et al 2013). Knowledge and application of Maslow's hierarchy of needs is now ubiquitous; a summary of the original model that follows suffices for this study:

i. Basic needs– These needs consist of biological and physiological needs. These needs include food, water, shelter, air, warmth, sex, and sleep, etc.

ii. Safety needs – These include the need for protection, security, order, law, limits, and stability. Meeting these needs is expected to secure the future satisfaction of the fundamental needs.

iii. Belongingness and love needs– These are work group, family, affection, and relationships issues, among others. They are also known as social needs. At this level, individuals seek friendship and love relationships and tend to bring others within their own defense mechanisms.

iv. Esteem needs – These needs are made up of a person's level of self-esteem, achievement,

mastery, independence, status, dominance, prestige and managerial responsibility. Here, people want to be appreciated, and feel that they belong; they want to fit into a network of social relationships.

v. Self-actualisation needs – which involve people realising their personal potential in life, attaining self-fulfillment, and seeking personal growth and peak experiences.

According to Maslow's original thought, one must satisfy each need in turn, starting with the most obvious or lower order needs for survival. After the lower order needs of physical and emotional wellbeing are satisfied, the individual expresses concerns for the higher order needs of influence and personal development. Conversely, if the satisfaction of lower order needs is not achieved, human beings may not be capable of addressing the maintenance of higher order needs.

Job Satisfaction

Job satisfaction results from the achievement of the goals that one expects through his contribution in the job (Saleem, Mahmood and Mahmood, 2010). Factors related to job satisfaction are relevant in the prevention of frustration and low job satisfaction or dissatisfaction because workers will be motivated to work harder and perform better if they are satisfied with their jobs (Bowen, Radhakrishna and Keyser 1994; Boltes, Lippke and Gregory 1995). Recognition is an essential factor that helps to increase confidence and self-esteem thus influencing job satisfaction (Ventrice 2010). Enjoyment at work and being comfortable with the people with whom we work are necessary factors that enhance one's job satisfaction (Perrewé and Gangster 2007, Hodson 2001). Some studies have revealed that there is a relationship between job satisfaction and work motivation – a person's satisfaction in a job acts as a motivation to work. Saleem, Mahmood and Mahmood (2010) stated that job satisfaction is dependent on work motivation. There can be no job satisfaction where there is no motivation (Das, 1999). In addition, Baschad and Piot (2005) showed that, adequate compensation raises one's performance and interest in the job. Louca et al. (2013) revealed that income is a good motivator that can influence job satisfaction. Walker and Sorce (2009) claimed that income, the opportunity to be creative, how challenging a job is and the feeling of personal gratification when performing a job contributes to the overall job satisfaction of an individual.

A Critique of Maslow's Motivation and Extrinsic Job Satisfaction Perspectives

Maslow's theory and other theories that favour extrinsic perspectives to human motivation have guided research on human needs for long, but Maslow's and other similar theories and perspectives have not been without criticism even very early their publication. One of the earliest critical opinions about Maslow was the work of Haire, Ghiselli and Porter (1966) in which managers in 14 different countries were asked to rate the importance of, and their satisfaction, with the fulfillment of a number of needs. They found that the country whose response fitted Maslow's need theory was the United States of America.

The work of Hofstede (1984) stands out in respect of empirical rebuttal of Maslow's model. Hofstede viewed quality of life from the perspective of quality of work life, averring that cultural factors are major influences to quality of work life. Based on a study that covered 53 countries, Hofstede found that it is fruitless to universalise the notion that meeting higher order needs will improve people's quality of life, because different cultures have different hierarchies of needs. He posited that there are societies which stress job challenge, achievement and job satisfaction of intrinsic needs and those in which primary loyalties are to family, relatives or clan. In this regard, job satisfaction depends on which society the individual is obliged to. According to him, job motivation and job satisfaction are matters that concern total quality of life, but they are culturally influenced because they are based on values.

In his PhD thesis, Reid-Cunningham (2008) supported the refutal of the directional hierarchy that Maslow proposed and rather suggested that there was no clear hierarchy or order in which needs appear to become predominant, but he supported the existence of lower and higher needs. Besides the ethnocentric attribution to Maslow's theory, Reid-Cunningham has shown that Maslow was reliving his personal experiences while growing up, citing

Maslow's biography by Hoffman (1988) very extensively. These opinions suggest that Maslow's hierarchy of needs appears so individualistic putting autonomy and self-actualisation as top priorities and neglecting values that are very dominant in collectivist societies such as family support and harmony.

Maslow is now generally believed to have been influenced by the mid twentieth century values and choices of the United States middle class (Hofstede 1984). It can be inferred from these researches that even if Maslow's needs are to be followed in modeling societies, Maslow's variables will cluster differently in different cultures. The implication of this observation is that improving people's quality of life would not necessarily be achieved by offering to people satisfactions that are higher in the hierarchy of needs, but rather in the understanding that people in different cultures and societies have different need hierarchies.

In a more recent book Pink (2011) has shown in a very graphical manner that human beings are motivated by factors different from the extrinsic explanations of Maslow. He showed that while extrinsic motivation would appear to motivate workers at first sight but that there are more socially situated factors that are often undermined. The consciousness of the significance of the likelihood that socially situated variables will explain job satisfaction has been growing. Just as the Newtonian first law of motion that an object in motion will stay in motion, and an object at rest will stay at rest, unless acted on by an outside force runs into problems at the subatomic level (Pink 2011), *carrots and sticks* can achieve precisely the opposite of their intended aims when baseline rewards are adequate and equitable. This observation is also related to Hofstede's cultural postulation of job satisfaction – job satisfaction is value laden and values are often mainly cultural. Earlier experiments and studies of Greene and Nisbett (1973; Deci, Ryan and Koestner 1999; Baard, Deci and Ryan 2004; Lepper and Reeve 2005, Green 2006; Chirkov, Ryan, Kim and Kaplan 2008) illustrate circumstances under which intrinsic factors explain job motivation.

There are many studies that have adopted Maslow's theory in Nigeria, with varying results. In his article, Ifedigbo (2012) and Akusoba (2014) suggest that the theory is still applicable in Nigeria, but Ifedili and Ifedili's (2012) study among university workers did not uphold the theory. In a popular blog Morakinyo (2014) has observed that Maslow's theory can no longer be used to describe motivation in Nigeria. According to him,

> *Many hungry people are now on social networks (Facebook, Twitter, LinkedIn, Myspace, etc) seeking to make friends with well to do people who might be generous enough to help or employ them. Virtually all religious adults in Nigeria belong to one religious group or the other. Even when they have not eaten and are not fasting, they give offerings. Young people renew their blackberry subscriptions before they think of buying lunch (Morakinyo 2014 p11).*

It is therefore not clear how the Maslow's motivation variables will cluster in Nigeria in respect of job satisfaction, and there is no understanding of the other variables that may account for job satisfaction aside of Maslow's. Although there is strong indication from the studies of Hofstede, and, Haire *et al* (1966) that cultural factors will influence people's job satisfaction and quality of life, African countries were not included in the 53 countries in his studies.

Without being considered as a hierarchy in which one need must be met before another, Maslow's model could be a useful categorisation of human needs. The various stages in Maslow's model can be viewed as independent clusters of factors, and not necessarily in linear procedural sequence as originally suggested by Maslow. Although Maslow supplied elements to the various stages in his model, rapid development in the human society, for instance, information technology, is expected to render the elements in Maslow's original clusters as in-exhaustive, thus permitting some adjustments. Maslow himself envisaged this development when he suggested the possibility that majority of people would attain the basic needs and then turn massively to esteem and self-actualisation needs.

It should be recalled though that, in his theory, Maslow postulated the possibility of the inversion of the triangle, such that in the future it might be possible for human communities to develop to the extent that most people will not be concerned with the basic

needs; rather, the focus will be on the higher order needs. In most countries of the world, this expectation is yet to be achieved; but the situation is obviously worse in developing countries.

The study was based mainly on how demographic characteristics moderate the influence of the five constructs in Maslow's theory of needs to explain job satisfaction motivation of IT artisans in Nigeria. The approach adopted here is that the needs in Maslow's theory were not considered as hierarchical. Rather the study viewed the needs as clusters of needs and then sets out to examine which clusters the respondents belonged to, and not whether one need is met before another is. These categories are physiological needs, safety needs, belongingness needs, self-esteem needs, and self-actualisation needs. Safety needs have been defined to include income, financial security, employment security and stability. Belongingness needs include family, peer relationships and societal belongingness.

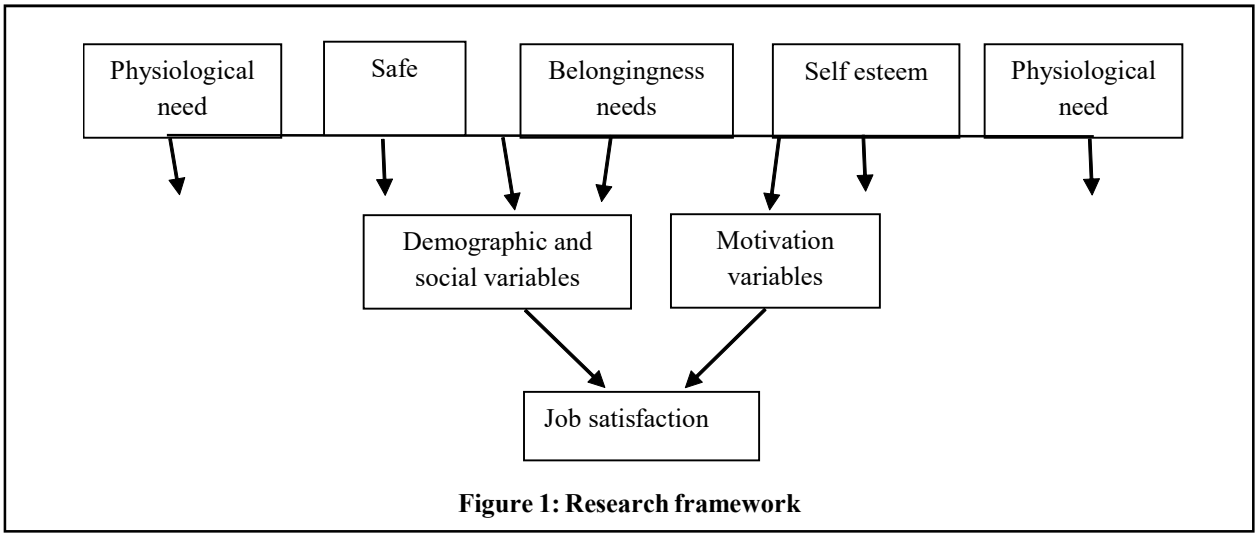

Figure 1: Research framework

Self-actualisation encompasses sense of achievement, self-growth and development, and new experiences. Figure 1 shows that the relationship between job satisfaction and the Maslow's needs moderated by social and demographic characteristics of the respondents. The model also shows a further indication of how socio-demographic variables relate to the deconstructed elements in Maslow's hierarchy of needs.

Research Methodology

Carried out within the positivist paradigms, a sample survey design guided examination of the opinions of IT artisans in Lagos. Lagos is a large, and ancient business city in Nigeria, and they host a large number of IT artisan workers. However, there is no current statistical record that has information about the artisans, apart from the report in 2013 that Alaba International Market in Ojo has about 2,000 shops while the Computer Village in Ikeja has about 1,600, all in Lagos. A combination of the largeness of the number of the expected respondents and the vast areas they occupy means that the best research design therefore would be a sample survey. We opted to use a questionnaire to collect data from the artisans about the subject matter.

To construct the questionnaire, a list of motivation variables was made based on a synthesis from the literature and sent to 15 identified scholars in economics, management and information science in three universities in Nigeria who were willing to assist in face-validating the instrument. A short letter in which we briefly explained why we were carrying out the study was also appended. The assessors were asked to suggest questions that could be used to gauge the opinions of the artisans' opinions on subject matter. The responses from the assessors were compared and the final questionnaire was constructed based on them. The final questionnaire has the following variables:

(a) Demographic and social characteristics: age, gender, marital status, level of education, length

of apprenticeship, age in the profession, income level and how the practitioners entered the profession.

(b) Motivation variables

(i) Physiological needs – The researchers measured this construct by asking questions about whether the respondents were on the job in order to find food, shelter and clothing.

(ii) Safety needs – The researchers constructed safety needs around whether the respondents felt secured in their job.

(iii) Belongingness needs – This section consists of three items focusing on whether the respondents actually love to be identified with the IT job, merely got influenced by friends to join the profession, and consider themselves to be sufficiently informed about IT.

(iv) Self-esteem needs – This section was measured by asking respondents whether they feel achieved, have mastery of IT, have a sense of independence, and belong to a high social status in the society by virtue of their job.

(v) Self-actualisation needs – This section consists of questions on whether the respondents feel fulfilled and are anticipating meeting their future expectations in life through their jobs.

(c) Job satisfaction

Job satisfaction is usually measured in many different ways and with a variety of questions and wordings, depending on the choice of the researcher and the situation at hand. Single-item questions regarding respondents' general job satisfaction such as overall emotional feeling exist, but there is a relative consensus that multi-faceted questions are better and they can be as stand-alone questions or in addition to single-item questions (European Monitoring Centre on Change 2014).

All the Maslow's motivation variables were conceptualised as ordinal variables of five categories, measured on a five point Likert scale of strongly disagree (=1), disagree (=2), neutral (0), agree (=3) and strongly agree (=4). However, it is remarkable to point out that ordinal variables take the state of nominal variables if they are recoded; for instance, in our case, to reflect those who agree (agree +strongly agree) and those who do not agree (disagree + strongly disagree). Zhu and Zhou (2002) made this point in their study on perceived characteristics, perceived needs, and perceived popularity of the Internet in China.

Also, we conceptualised job satisfaction with questions about (i) the respondents' intention to remain on the job and measured this with 'wish to stay', 'wish to leave' and 'anyhow' (ii) We also inquired whether the respondents considered themselves as having the opportunity for self-development - measured with 'great opportunity', 'slim opportunity' and 'no opportunity'. Furthermore, we examined the reported (iii) income measured with 'high', 'low' and 'manageable'. Finally, the respondents feeling about their job was measured as a binary variable with 'yes' or 'no'. We consciously measured job satisfaction using multiple approaches to increase the chances of gauging more adequately how much motivation contribute could contribute to job satisfaction. The nature of the variables and the way they were managed complemented the adoption of advanced statistical approaches, and the relative largeness of the sample size to ensure that sampling errors were minimised.

Due to the absence of a sampling frame, the researchers resorted to accidental sampling to survey only those artisans who were available, accessible and willing to complete the instrument. We approached the artisans in their shops and explained the mission of the research and solicited their cooperation; the questionnaire was administered to those who consented. It was deliberate to target 250 copies to enable the survey cover a wide range of the artisans; it is also large enough to permit inferential reasoning.

The questionnaire was administered during April to December 2016 by the two researchers and 10 assistants. The questionnaire was administered to the 250 respondents that were willing to participate in the study. The data collected with the questionnaire was analysed using the Statistical Package for Social Science (SPSS). For three of the four job satisfaction variables (i) retention intention on the job measured with wish to stay, wish to leave and anyhow; (ii) perception of income measured as high, low or manageable and (iii), multinomial logistic regression is used to predict a

categorical placement in or the probability of a category membership on a dependent variable based on multiple independent variables. Multinomial logistic regression is a simple extension of binary logistic regression that allows for more than two categories of the dependent or outcome variable. Multinomial logistic regression is often considered an attractive analysis because it does not assume normality, linearity or homoscedasticity. It would be sufficient to code the categories into binary forms to deploy binary logistic regression technique but the intent here is to reveal the situation with respect to each of the three categories.

The dependent variables are on nominal scale, justifying the use of multinomial logistic regression (MLR) for the analysis, MLR coefficients often represent the probability of an individual falling into one category versus the probability of belonging to the baseline category (i.e., wish to stay in the job). Hence, the normality of these measures could be considered sufficiently stretched to accommodate ordinal reasoning (Zhu and Zhou 2002). The language of ordinary least squares (OLS) was used to report and interpret the results for ease of comprehension by those who do not have deep statistical training.

Results

Socio-demographic Characteristics

The result shows that all the respondents were male (Table 1). The result also shows that respondents within the age bracket 27-32 years were the largest respondents with a frequency of 110 (40.9%) of the total respondents. Respondents within the age bracket 33-38 with a frequency of 80 (29.3%) followed. Respondents within the age bracket 21-26 constituted 15% while those within the age bracket 39-44 constituted 9.9%.

Table 1: Socio-demographic characteristics of Respondents

Demographic Characteristic	Frequency	Percentage
Sex (N=273)		
Male	273	100
Female	0	0
Age (years,N=273,Mean=3.505,S.D=1.0401)		
21-26	41	15.0
27-32	110	40.3
33-38	80	29.3
39-44	27	9.9
45-Above	15	5.5
Educational Qualification (N=273)		
Primary Education	13	4.8
Secondary Education	108	39.6
Technical Education	39	14.3
University Education	111	40.7
Professional Qualification	2	.7
Marital Status (N=272)		
Single	132	48.4
Married	140	51.3
Number of Employees (N=273,Mean=3.048, S.D=0.986)		
1-2	27	9.9
4-6	45	16.5
7-9	89	32.6
10 and Above	112	41.0

Type of Business (N=273)		
Maintenance/Repair	270	98.9
Computer Cloning	34	12.5
Installation	76	32.6
Membership of Association (N=273)		
Union membership	245	89.7
Professional body	6	2.2
Income Level per Week (Naira) (N=273, Mean=3.670,S.D=1.090)		
0-1000	7	2.6
1001-5000	37	13.6
5001-10000	62	22.7
10001-50000	92	33.7
Above 50000	75	27.5

Respondents within the age bracket of 45-above were the least (5.5%) in number. In terms of educational status, the largest number of respondents were those with university education (40.7%). Respondents with secondary education followed closely (39.6%) while those with technical education and primary education constituted 39 (14.3%) and 13 (4.8%) respectively. Only two or 0.7% reported any professional qualification. Majority of the respondents (51.3%) were married while 48.4% were single. The result also reveals that IT businesses with at least 10 employees constitute (41.1%), followed by those in the range 7-9 (32.6%), while the ranges 4-6 and 1-3 constituted 16.5% and 9.9% respectively.

Nearly all the respondents (98.9%) engaged in maintenance/repair services while 32.6% of the respondents were into software and hardware installation and 12.5% were into cloning. 89.7% of the respondents were members of the union while only 2.2% belonged to professional bodies. In respect of the income level, 33.7% of the respondents earned between 10,001-50,000 in Naira per week, 27.5% earned above 50,000 Naira, 22.7% earned 5,001-10,000, 1001-5000 Naira (13.6%) and 2.6% earned between 0-1000 Naira per week.

Addressing the Research Questions

Research Question One: *Is there a significant relationship between the motivation variables and retention, income and prospect among the artisans in Lagos Nigeria?*

Table 2 shows that physiological need of food has a significant relationship with the perception of income as high and opportunity for development being great, whereas shelter has significant relationship with retention and future development prospects. The significant impact of security as a basic need is expected: there is a significant relationship between wishing to stay, having high income and having high prospect for development on the job. Of the four belongingness variables, three namely loving to be identified, love to feel belonged and being considered informed about IT have significant relationship with intention to remain in the profession. However only being informed about IT relates significantly to both high income and great chances of development in the job. For esteem needs variables, feeling achieved, having mastery of the profession and feeling belonged to a high social class in the society predicted retention intention of the respondents. These variables also predicted high income; and except feeling achieved, predicted great expectation of development on the job.

Table 2: Multinomial Logistic Regression Coefficients Predicting Retention, Income and Prospect

	Retention	Income	Development
	Wish to stay Vs Wish to leave Vs Anyhow	**High Vs Low Manageable**	**Great Vs Slim Vs None**
Physiological needs			
Food	–2.029	0.137***	2.883***
Shelter	–0.663***	–0.322	–1.114 ***
Clothing	–0.501	–0.050	–0.060
Safety needs			
Security	0.649 ***	0.042***	0.144***
Belongingness needs			
Love to be identified	–0.137***	0.267	0.150***
Influenced by friends	–0.020	0.153	–0.154
Informed about IT	–0.604***	–0.104**	0.010 ***
Esteem needs			
Feel achieved	1.147	1.097***	2.071***
I have mastery	0.112***	-1.112***	0.715***
Feel belong to a high social class	0.629***	1.120***	0.609
Self-actualization needs			
Genuine interest in my job	0.186***	–1.078	0.002
Feel fulfilled in my job	–0.205	3.100	–0.015
Met my expectations	–0.108***	–2.138	1.184
Age (Others=ref category)	–0.325	0.786	–0.059
Marital status (Others=0)			
Married	–0.526	0.367	0.649
Single	0.060***	0.043***	0.0416***
Household size	-1.147***	-1.629***	1.007
Educational level (No formal education=0)			
No formal education	2.009	1.100** *	1.190***
Primary education	2.721	1.109	2.891
Secondary education	0.998	1.121	2.121
Tertiary education	0.198	0.008***	-0.118***
Length of Apprenticeship	1.190***	0.998	2.721
How long have you been on this job?	2.008***	3.118	0.091
Who introduced you into this job? (Others = 0)			
Friend	1.000	0.009***	0.110
Parent	0.010***	1.100	0.109
Sibling	1.200	3.011	2.111
No one	1.100***	1.101***	0.194***
Spouse	0.867	0.108	0.138
Income per annum	3.154***	-1.067***	2.004***
Intercept	5.688***	2.830***	4.006***
McFadden pseudo R^2	0.562		
Number of cases	250		

Note: * = significant at 0.05 level of significance**

Self-actualisation needs variables present a different result altogether. Genuine interest in the job and the job meeting the expectations of the respondents were significant predictors of the respondents wishing to remain on the job, attaining expected heights in life predicted income; the other relationships are not significant. Then come the sociodemographic variables. Those who are married wish not to remain on the job, as the slope of the relationship is significant but negative. But both those who are married and those who are single would wish to have higher income than they are getting now, while only those who are single reported a significant relationship with positive future prospect in the job. Age did not predict any of the dependent variables. With positive slopes for all the three categories of dependent variables, the larger the household size the more the respondents would want to retain in the job and wish to have higher income; the relationship with high prospect in the job is not significant.

Is there any significant relationship between educational status of the respondents and the categories of the dependent variables? Table 2 shows that tertiary, secondary and other forms of education did not predict respondents' intention to remain on their jobs; secondary education positively predicted income and prospects in the job. Other category of educational status only predicted income. Also, table 3 has implication that the longer the respondents spent to acquire the skill of IT artisanship, the more the likelihood that such respondents would remain in the job. This is the result of the positive and significant relationship between length of apprenticeship and retention in the job. Length of apprenticeship did not predict whether or not the respondents would be satisfied with the income or have a prospective future in the job.

Research Question Two: *Is there a significant relationship between the motivation variables and perceived satisfaction with the job among the artisans in Lagos Nigeria?*

A single question in the questionnaire inquired from the respondents whether they considered themselves satisfied with their jobs or not. Since this variables was measured as yes (=1) or no (=0) responses, binary logistic regression was considered very suitable in addressing the relationship between the demographic characteristics and this variable. The direct binary logistic regression shows that the physiological needs of food positively predicted job satisfaction, but shelter and clothing did not. Safety needs did predict job satisfaction. In respect of belongingness needs, a major element in the job satisfaction of the respondents is their love to be identified with the profession, which this significantly and positively predicted the dependent variable. Being informed about IT also predicted job satisfaction positively although the slope is fractional.

Table 3: Binary Logistic Regression Predicting Job Satisfaction

	B	SE β	Wald $\chi 2$	P	e^{β}(odds ratio)	95%
Physiological needs						
Food	0.450	0.181	0.444	0.031	0.110	(0.348,9.214)
Shelter	1.009	1.080	0.201	0.309	0.007	(1.002,7.910)
Clothing	0.003	0.023	0.211	0.701	1.801	(0.001,0.079)
Safety needs						
Secured	-0.200	0.030	3.041	0.013	1.090	(3.09, 7.990)
Belongingness needs						
Love to be identified	1.109	0.436	4.091	0.004	0.026	(0.007,1.390)
Influenced by friends	0.222	0.131	0.001	0. 170	0.120	(0.011,1.911)
Informed about IT	0.000	0.461	0.098	0. 001	0.011	(0.000,0.002)
Everyone was doing it	-0.002	0.030	0.101	0.304	0.001	(0.001,0.110)
Have latest info on IT	-0.119	0.501	0.111	0.400	0.233	(0.107,1.002)
Esteem needs						
Feel achieved	0.115	1.088	0.401	0.041	2.110	(0.000, 8.01)
Have mastery	0.304	0.710	1.440	0.000	1.011	(0.190,3.251)
Feel belonged	0.249	0.281	1.050	0.000	0.973	(0.000, 8.01)
Self-actualization needs						
Genuine interest	0.021	0.030	0.004	0.413	1.911	(0.091,1.333)
Feel fulfilled in my job	0.720	0.440	2.444	0.000	1.001	(0.000,1.099)
Met my expectations	-0.111	1.010	0.007	0.001	1.074	(0.091,1.810)
Opportunity for growth	0.222	0.073	2.489	0.131	1.501	(0.091,3.009)
Age	-0.109	0.026	5.91	0.024	0.160	(0.011, 1.88)
Marital status (Others=0)						
Married	-0.119	0.611	0.001	0.042	0.301	(0.091,1.430)
Single	0.004	0.111	0.100	0.060	0.211	(0.000,1.009)
Household size	-0.160	0.400	3.001	0.041	2.191	(1.233,2.679)
Education (Others=0)						
No formal education	0.300	0.600	0.940	0.007	2.72	(0.013,6.531)
Primary education	0.119	0.120	0.051	0.027	1.01	(0.041,6.202)
Secondary education	0.103	0.600	1.925	0.002	2.20	(0.320,4.022)
Tertiary education	-0.109	0.120	0.090	0.022	1.10	(0.450,3.009)
Length of apprenticeship	0.205	0.811	0.14	0.041	0.10	(0.011,9.210)
How long practicing this job?	-0.112	0.900	0.411	0.031	1.913	(0.009,1.099)
Who introduced you into this job? (others=0)						
Friend	0.511	0.901	0.115	0.300	0.175	(0.011,2.101)
Parents	0.100	0.138	0.300	0.119	0.101	(0.100,1.602)
Siblings	0.111	0	0.119	0.010	0.109	(0.009,2.082)
No one	0.101	0.170	0.103	0.099	0.183	(0.005,2.005)
Spouse	-0.109	0.008 -0.010	-0.109	0.029	-0.179	(0.010,0.109)
Income per Annum	-0.222	0.004	4.240	0.031	1.099	(0.090,3.019)

The esteem needs performed better than the rest motivation variables going by the number of categories that successfully predicted job satisfaction. Feeling achieved, having mastery of the IT task and the feeling that one belongs to a respectable profession all predicted job satisfaction of the respondents. Genuine interest in the profession and feeling of having attained in life were the self-actualisation categories that predicted job satisfaction, but not so the case with meeting expectations and opportunity for growth.

Age is not a predictor of job satisfaction among the artisans; but there is a negative but significant relationship between being married and job satisfaction in relation to those respondents with other than single marital status. This might be associated with why single did not also predict job satisfaction compared with those respondents who have other statuses. Educational status presents a very interesting picture: lower educational statuses, namely non formal education, primary education and secondary education predicted job satisfaction positively and significantly, but tertiary education predicted job satisfaction negative but significantly. Another interesting result is that the longer the respondents reported spending in apprenticeship the more likely that they will report to be satisfied with their jobs. The same result does not apply to length of time spent in the professional; although the relationship is significant, the negative slope suggests that the longer the stay in the job, the less the job satisfaction derived. Finally, those respondents who joined the profession from their own choice reported being satisfied with the job in comparison with those who reported joining the profession through other persuasion.

Determinants of Physiological needs (PN), Safety Need (SN), Belongingness Needs (BN), Self-Esteem Needs (SEN) Self-Actualisation Needs (SAN)

Both the title of this study and the theoretical model adopted demand investigation of the role of demographic and socioeconomic characteristics of individuals on the motivation constructs. The relationship between demographic variables and the motivation variables are tested here using OLS. It is informative that this analysis pertains only to those respondents who reported agreed and strongly agreed to the questions on the motivation variables.

Research Question Three: *What is the relationship between the demographic characteristics of the artisans and the motivational variables?*

Table 3 shows how demographic characteristics of the artisans relate to their motivation needs.

Table 4: Ordinal least squares regression coefficients predicting the motivation variables

	Physiological needs (PN)	Safety need (SN	Belongingness needs (BN)	Self-esteem needs (SEN)	Self-actualisation needs (SAN)
Age	2.561	0.460***	-12.271***	0.462***	-1.740
Marital status (Others=0)					
Married	0.419***	-0.111***	0.460	0.326	0.460***
Single	-0.510	2.56***	-0.510***	-0.201***	-0.121***
Household size	0.411***	-0.511***	0.336	0.901	0.756
Education (others =0)					
No formal	1.513***	-1.56	0.786	-0.121***	-0.121***
Primary	-12.272***	2.11	-0.911	0.006	0.006
Secondary	-20.742	0.46	2.56	0.46	0.46
Tertiary	1.727	-0.351	0.246***	-0.151	-0.151
Length of apprenticeship	0.400	0.051***	0.310***	1.110***	0.912
How long on the job?	1.056	2.090	-2.271***	0.740	1.703***
Who introduced you? (others=0)					
Friend	-1.501	.356	0.006***	0.116	0.106***
Parents	0.356	-0.171***	-0.511	-0.231	-0.211
Siblings	0.416	0.126	1.264	0.230	0.506
No one	-0.151	0.309	0.164***	0.143***	0.304
Spouse	0.442***	-0.119	-0.251	-0.412	-0.105
Income/Annum	2.522***	0.146***	12.271***	20.741***	1.712***

Age significantly and positively relates with safety needs and self-esteem needs, and significantly but negatively with belongingness needs. Married status relates with physiological, safety and self-actualization needs, whereas single status has significant relationship with all the motivation needs; however, the relationship with all, except safety needs, is negative. With a positive slope, household size predicts physiological and safety needs. Education variables present a more interesting result – no formal education predicts only physiological needs while secondary did not predict any of the motivation needs at all.

The results also suggest that those who have tertiary education are more focused towards pursuing higher order needs of belongingness, self-esteem and self-actualisation needs. Length of apprenticeship has a positive and non-fractional relationship with all except physiological needs; length of stay in the job predicts belongingness and self-esteem. On how the respondents got into the business, friends have a significant relationship with belongingness and self-esteem, parents only predict belongingness needs, self predicts belongingness needs and self-esteem while spouse predicts physiological needs and self-actualisation needs. Income presents an interesting result – it predicted all the needs.

Discussion of Findings

If the basis for assessing job satisfaction variables of income and development prospects would be food, then the respondents would want to remain in the job. This is not a contradiction to the result obtained during the diagnostics in Table 2; rather it supports the observation that the respondents are able to find food to eat and maintain their lives and those of their dependents. As would be expected, although the respondents appeared not to be on the job primarily to get shelter, shelter constitutes an important component in whether the respondent would want to remain in the job and whether the respondents would consider their prospects in the job as great. Jiboye (2011) and Oyelaran-Oyeyinka (2014) have shown that even low cost shelter that affords privacy

and protection against the elements in the environment is still beyond the reach of most people living in Lagos. Furthermore, whether the respondents would feel willing to stay on the job, consider their income as high or consider prospects as promising would be strongly determined by whether the respondents felt some sense of security on the job. Several factors could make this factor important in the mind of the artisans – in a study on artisans in South Africa, Jordan and Barry (2009) have shown that job security among artisans could be affected by income and prospects for future development.

Although majority of the respondents joined the profession through their friends, influence from friends and belongingness are not determinants of whether the respondents would stay in the job, perceive their income as good or develop a positive perception about the future of the job. Rather, the significance of identification and personal assessment of being very knowledgeable with the IT industry are very strong determinants of wishing to remain in the job. Identification could mean that an individual's skill is recognised among peers even if the individual had not made a financial breakthrough; it could also mean that the individual is ranked high in his ability in the profession. This idea should relate very strongly with self-appreciation of one's knowledge level about IT which clearly determines all the dependent variables. By inference, individuals would stay on the job, make or perceive their income as high and expect that the future would be bright in the profession if their assessment of their level of knowledge about IT is very high. This result is supported by Pink (2011) that there are factors outside Maslow's variables that motivate job choices and job satisfaction.

Self-esteem constructs determined most of the constructs of job satisfaction in this study, except the wish to remain in the profession and perception about the future in the job. Significantly, the income of the respondents is low but they have self-esteem, a result upholds the positions of Pink (2011) and Hofstede (1984). Mastery of the job, a sense of achievement and feeling belonged to a high social class relate with evaluation when income is assessed adequate. The likelihood is that those who have mastery over the IT artisanship business might also consider their income as sufficient for the labour. Those who feel belonged to the society by virtue of the job would wish to remain on the job and consider their income as sufficient even if they are not sure of their future in the profession.

Self-actualisation exhibited a different characteristic; only two of its constructs namely having genuine interest on the job and meeting expectations predicted wishing to remain in the profession, the later predicting the dependent variable negatively. It could be recalled that self-actualisation had the least weight among other motivational constructs, after basic needs. Those who are not married are most likely to be younger, and have less family challenges compared with those who are. Hence, they are optimistic about the future, even if things are not working out well now. This may be the reason why single positively predicted all the dependent variables. The reverse is the case with household size; larger household sizes would require better income, such persons are the most to desire change of jobs, and consider their income as low.

Those who have no formal education are more satisfied with the job than those who have, as they reported hope for a better future and income. Although it is not clear whether those with tertiary educational qualification wish to remain in the job or not, they are happier with their income; they did not report a prospective future. Evidently, those who spent a long time learning the trade were associated with low level of education while those who have been in the trade for a long time reported wishing to remain in the profession. Self-introduction into the job relates to all the dependent variables; these people seem to know what they want and have decided to patiently pursue their dreams. Those who joined the profession through their friends are in the business to make money, but might wish to change jobs if the opportunity arises while those introduced by their parents wish to stay on the job. As expected, those who make high income would want to stay on the job; they did report their income as high or sufficient although they have hope for better future in the job.

The study has provided evidence for the impact of various needs of the artisans on their job satisfaction. Basically, the study has highlighted the specific elements in the Maslow's needs constructs that command the most influence in respect of job satisfaction of the artisans, and not on whether the needs are in hierarchy. On a scale of yes or no, food

and shelter, love to be identified and being informed about IT, love to belong, feeling fulfilled and meeting expectations, are the major elements in the five-level hierarchy of needs that describe the job satisfaction of the artisans. A curious point would be the need to seek to establish whether these predictors integrate to a new constructs which may be used to understand further and improve the level of job satisfaction among the artisans. This suggestion is important in view of the observation that factors that explain job satisfaction among the artisans are unevenly distributed in the motivation needs. The variables also predict job satisfaction differently when job satisfaction is measured differently. But it is informative however that some of the constructs, for instance, food, predicted job satisfaction irrespective whether job satisfaction was viewed as single constructs or as consisting of other constructs.

The foregoing synthesis also applies to the impact of demographic characteristics on job satisfaction. While age, for instance did not explain any of the components of job satisfaction, it explained job satisfaction when considered as a single construct. In consonance with Zhou and Zhu (2002), this result suggests that achieving job satisfaction among the artisans would require a deconstruction of the concept in achieve a more efficient result.

Human needs are behavioural. They influence other behaviours and can also be influenced by other variables (Anholt, Mackay and Trudy 2010). The ordinal regression result suggests that the older the artisans get, the more likely the artisan is to be concerned with safety, belongingness and self-esteem needs, but not self-actualisation. It is a natural expectation that older persons are more likely to have high number of dependents, and confront more challenges such as achieving personal goals in life than younger persons. Also, older persons may be considered to have lesser time for personal development and to pursue new careers compared with younger persons. Education remains one of the most important variables in human development; it is vital in determining how well people prepare, develop and confront the future in their respective endeavours (World Bank 2007).Those who hold lower and no formal educational statuses appear to be satisfied meeting physiological needs while those that hold tertiary education al qualifications seek to be focusing on belongingness and self-actualisation needs.

Conclusions and Recommendations

This study evidently questions the adequacy of Maslow's *carrots and sticks* extrinsic theory which achieves precisely the opposite of its intended aims when baseline rewards are adequately and equitably defined. Those who are engaged in the IT artisanship jobs did so not for extrinsic purposes of meeting their personal needs of physiology, safety, belongingness, self- esteem, or self-actualisation. They were people who had passion for the IT profession aside of what the profession could enable them either get or become. They were people who were hopeful that their resilience in the profession would someday yield them benefits beyond their present experiences. The result of this study has some very vital implications.

At all levels, job satisfaction in the IT cluster in Lagos Nigeria is low; but this is beyond income and other attractions. Rather, stimulating work experience, the pride of being involved in a modern and trendy profession and the potentials they expect from their labours are the major reasons many IT artisans remain in their jobs. Issues related to whether they are successful or in their businesses currently are practically side issues to their job satisfaction. The artisans consider intellectual pursuits and technical growth opportunities as simply more interesting than other benefits. Despite the length of time they put into the work, the low profits they make and the steep technology learning curves, it is the work challenges that keep IT artisans going. The artisans want to solve IT problems, and learn new technologies and then use the technologies to help the business to succeed. The artisans want to be identified as people engaged in a profession that is critical to development and their sense of belonging is moored to this consciousness. The artisans want to have a sense of security in their professions.

The result points to the potentials in the IT sector for job creation and mitigation of unemployment in Nigeria. IT operators and professionals are available and willing to participate in deploying IT for personal, public, and corporate developmental purposes not moored to extrinsic benefits. Also, the result has implications for the importance of apprenticeship in the IT artisanship profession as a strategy for skill acquisition. Those that have lower education and who spent longer time in apprenticeship are more likely to be seeking to

meet safety needs, belongingness needs and self-esteem needs, just as those who have spent a long time in the job have tendency to be seeking for belongingness and self-actualisation needs. They probably have an expanded customership base, have better control of the business and may be older in age to seek for new careers. Crucially, income is a predictor of all the needs; increased income could create access to meeting other needs. It must be reiterated here that this study was not designed to fit the Maslow's hierarchy of needs model; rather the study was concerned with how the variables in the model could perform in a study on motivation and job satisfaction. The key recommendation coming out of this study is that the private and public sector investors should capitalise on the evidence that the IT sector is attractive to youth and an encouragement for addressing the development of the sector, to position the sector as a springboard for national development.

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Perceptions of Librarians and Library and Information Science Educators towards Collaboration and Promotion of Information Literacy in Nigeria

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Abstract

This study investigated the perceptions of librarians and library and information science (LIS) educators towards collaboration and promotion of information literacy (IL) in Nigeria. The study adopted the descriptive survey and used questionnaire as the instrument for data collection. The simple random sampling technique was used to select five state universities teaching LIS in Nigeria. The population of the study consisted of 103 librarians and LIS educators. Data were analysed with percentage and mean. The study found that the perception of the concept of IL is high and librarians and LIS educators share a similar opinion on the core skills that students should have from IL. There is evidence of positive perception and willingness to collaborate on IL between both groups although some differences were identified in the areas where librarians and LIS educators are willing to collaborate. Perceived challenges such as inadequacy of facilities to teach IL, reluctance in having IL in the curriculum and an unfounded fear of unwillingness to collaborate from both librarians and LIS educators were also identified.

Keywords: *Information Literacy, Librarians, Library and Information Science Educators, Universities, Nigeria.*

Introduction

Information literacy (IL), is a strong pillar of the knowledge society because it has to do with a set of abilities requiring individuals to recognise when information is needed and have the ability to locate, evaluate, and use effectively the needed information (*American Library Association, 2018*). The need for these skills became heightened due to the availability of diverse and complicated information resources, occasioned by the advances in information and communication technologies (ICT). A person who has these skills is termed information literate, can be independent, be a lifelong learner and ultimately survive in the 21st Century information environment (Australian and New Zealand Institute for Information Literacy, 2004).

For students, IL provides much needed skills that will become very useful for knowledge based development and lifelong learning, even long after they would have left school (Okoye, 2013). With information easily accessible today, only those who are capable of finding, evaluating, analysing, and conveying information to others effectively and efficiently are likely to succeed at whatever they do. Igbo and Imo (2017) identified IL as the basic foundation of learning in an environment of abundant information resources occasioned by the advances in technological development, posited that, undergraduate students are in critical need for IL skills. It is essential for undergraduates in this information technology age to develop the skills of independent information searching, evaluating and utilising of all available sources of information. The extent of relevance is seen in its importance in allowing students to cope by giving them the skills to know when they need information and where to locate it effectively and efficiently (Baro and Ugu, 2019).

Over recent decades, the university library has been at the forefront of helping students and other library users acquire library use skills that help them effectively use information. However, the availability of diverse and more complicated information resources, occasioned by the advances in information and communication technologies (ICT), have caused libraries to position themselves as the providers of IL training (Chen and Lin, 2011). For a long time in Nigeria, IL efforts have been championed by librarians in the form of library instruction sessions. Presently, there is an urgent need to explore models of collaboration between librarians and LIS educators on ideas and examples of ways of ensuring that IL is taught to all categories of students in universities. Arguing along this line, Russell (2006), indicated that collaboration enhances effectiveness and efficiency in teaching methodology, enabling meaningful contribution from the teaching faculty and the librarians, allowing a more productive use of resources, application of educational technology for independent and problem-based learning. Also, Ushuel (2007), pointed out that for imparting information literacy skills to students, courses/ learning experiences should be organised with cooperation among faculties of education, department of ICT education and instructional technologies, department of information management, and university libraries.

This study investigates how collaborations between librarians and LIS educators can promote IL in the universities funded by state governments in Nigeria. In the context of this study, the collaboration sought after is that with LIS educators. Library and Information Science (LIS) as an academic discipline, engages professionals whose duties are only different from those librarians in the sense that while librarians mostly serve in the library establishment, LIS educators focus on training future library personnel. LIS educators having been trained in the same principles and practices of librarianship as librarians, and as such are as knowledgeable as librarians in library activities and IL. Being always seen as the responsibility of librarians to inculcate IL skills to students in academic settings, the major aim of this study is to ascertain the perceptions of librarians and LIS educators towards collaborating to promote IL in state universities. The need for this study arose from a lack of information available in the literature about how librarians and IL perceive the notion of collaboration to promote IL programmes, and how willing they are to undertake such a partnership should the need arise.

Statement of the Problem

Several studies, (Baro and Zuokemefa 2011; Anyaoku, Ezeani, and Osuigwe 2015) observed that university libraries in Nigeria have over the years engaged in different information literacy (IL) practices ranging from library tour/orientations sessions to introductory information skills, database searching skills, bibliographic training and use of the library. These courses are done through orientation programmes and various user education initiatives involving one-on-one and classroom instructions mostly in the form of library use instructions. There are recent reports that university students are in critical need for information literacy skills because, most students in Nigerian tertiary institutions have been found to lack the necessary IL skills (Baro and Zuokemefa, 2011; (Okon, Etuk and Akpan, 2014). This situation is of great concern, especially at a time when information access and use of information are extremely indispensable, or even unavoidable. Hence, there is the concern that enough is not being done to teach students IL skills.

The idea of collaboration between librarians and teaching staff in tertiary institutions to popularise the concept of IL has particularly been identified as a very effective means of enhancing students' skills in the use of information and their overall performance in learning (Ojedokun and Lumande, 2005). However, this approach of collaboration between librarians and LIS educators is yet to be explored especially in state owned universities in Nigeria. Very little is known about the perception of these two groups concerning collaboration to teach IL. Also, there appears to be very scare research on ways that LIS educators can join librarians to promote information literacy successfully and the possible challenges therein.

Research Questions

1. What is the level of awareness of librarians/ LIS educators about the concept of IL in Nigerian universities?
2. What are librarians/LIS educators' perception

about the core skill that students should acquire from IL?

3. To what extent are LIS educators willing to collaborate with librarians in promoting IL?
4. In what areas can librarians and LIS educators collaborate in promoting IL?
5. What are the perceived challenges to collaborations between librarians and LIS educators in promoting IL?

Review of Related Literature

There have been many conceptual definitions of IL, all of them evolving from the 1970s when IL was first introduced by Paul Zurkowski. Over the years, the concept has been redefined and modified to suit the discussions of the times. One of the most recent definitions, is that put forward by the Association of College and Research Libraries (ACRL) (2016) that IL is "the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning. Another dimension to IL is provided by Chartered Institute of Library and Information Professionals in their definition. Their definition stated that IL is knowing when and why you need information, where to find it, and how to evaluate, use and communicate it (CILIP, 2012). Further explaining that an individual's ability to critically think and make balanced judgments about information at his disposal enabled him to be regarded as information literate (*CILIP Information Literacy Group 2018*).

The abilities that one develops from being information literate are regarded as IL skills. The skills that are required to be an information literate person call for an understanding of: a need for information, the resources available, how to find information, the need to evaluate results, how to work or exploit results, how to communicate or share your findings and how to manage your findings. Information literate people are those who have learned how to learn. (*CILIP Information Literacy Group 2018*). According to ALA (2000), by ensuring that individuals have the intellectual abilities of reasoning and critical thinking, and by helping them construct a framework for learning how to learn, colleges and universities provide the foundation for continued growth of students throughout their careers, as well as in their roles as informed citizens and members of communities.

Information literacy is common to all disciplines, to all learning environments, and to all levels of education. Hence, the concept presupposes that students must be aware of a need for information and knows how to find, evaluate and subsequently use such information to solve problems and make decisions. With the information glut that characterises the 21st Century, IL becomes a necessary tool required to navigate information got from the Internet, or the World Wide Web, online databases, books or document, and other possible sources. Inherent in the concept of information literacy is the ability to understand and critically evaluate and make use of information to solve specific problems or tasks at hand (Okon, Etuk and Akpan, 2014). The definitions and descriptions of information literacy presented over the years can be summarised in three concepts as identified by Boekhorst (2003):

1. The ICT concept: information literacy refers to the competence to use information and communication technologies (ICT) to retrieve and disseminate information.
2. The information (re)sources concept: information literacy refers to the competence to find and use information independently or with the aid of intermediaries, and
3. The information process concept: information literacy refers to the process of recognising information need, retrieving, evaluating, using and disseminating of information to acquire or extend knowledge.

Studies have shown that teaching staff in most institutions recognise the centrality of IL skills in academic work and wish to help students improve their IL skills (Kuh and Gonyea, 2015). Williams and Wavell (2007) reported that teachers generally thought of IL as process and skills oriented, including reading skills and basic understanding of text and vocabulary, rather than outcome oriented i.e. knowledge building, creation, communication), with little emphasis on the relationship with learning or problem solving. A study by Anyaoku (2016)

investigated the conceptions of information literacy among librarians in South Eastern part of Nigeria, and found that librarians conceptualised information literacy as a meta competence involving different information skills and abilities. By examining the perceptions of students, teaching faculty, and librarians. Yevelson-Shorsher and Bronstein (2018), presented three dimensions on the concept of IL and its skills in the academic environment. Their observation was that, to the teaching faculty, IL helps students to gain access to vast amounts of information that is often unsupported, unfiltered, and unreliable, they must be given this crucial set of skills.

Bruce (2003) defined IL skill as the ability to access, evaluate, organise and use information in order to learn, solve problem, and make decisions irrespective of the settings is information literacy skills. In the opinion of Ojedokun (2007), IL skills require an individual to be able to define problem; initiate a plan to find information; locate and access resources; use the information; synthesise information; and carry out some forms of evaluation. The acquisition of IL skills puts a student at place where he or she is able to exhibit a responsiveness of how to gather, use, manage, synthesise and create information and data in an ethical conduct and will have the information skills to do so effectively (SCONUL, 2011). IL as a set of skills includes the technical skills necessary to operate a computer and more importantly, the critical thinking skills necessary to evaluate and use the information (Springer, 2009). The University of South Carolina (2018), listed ten IL skills that students must possess; they are:

- Know when information is required for a specific research assignment or academic task.
- Know how to formulate research questions to guide information search.
- Know where to find and locate quality information.
- Determine and understand sources of information.
- Know how to select the best source of information that best suits their purpose.
- Know how to organise information and consolidate all of this information.
- Know how to use the information to complete the assignment, task, or project.
- Present information in a way that is acceptable and understandable.
- Evaluate information
- Use information in an ethical and fair manner.

Several researchers have considered the core IL skills which undergraduate students should be equipped with after being exposed to IL instruction and programs. Olubiyo, Ogunniyi, Ademilua, and Akanmidu-Fagbemi, (2019) found that the undergraduates at Adeyemi College of Education, Ondo, Nigeria were more exposed to library use and computer use skill from the IL instruction. An assessment of IL skills among second-year undergraduate students of the University of Livingstonia in Malawi, (Flywel and Jorosi, 2018), revealed that the students had IL skills in awareness of types of information sources but had problems in identifying diverse information resources and their usage. They also demonstrated lack of skills in information search and Web retrieval techniques. With respect to skills in evaluation of information, the study showed that the students lacked information evaluating skills. This result led the authors to conclude that the majority of students at the University of Livingstonia did not demonstrate adequate information literacy skills even though they had IL training

Mohktar and Majid (2006) have defined collaboration as a mutually beneficial and well-defined relationship entered into by two or more organisations to achieve results they are more likely to achieve together than alone. Although librarians have always been the ones in charge of use of library education (Bavakutty and Nasirudheen, 2008), Ushuel (2007) argued that, to effectively impact IL skills to students, there is the need for cooperation among faculties of education, department of ICT education and instructional technologies, department of information management and university libraries. The University of Texas (2016) asserts that success in implementing information literacy depends on collaboration between classroom faculty, academic administrators, librarians and other information professionals. The above views rightly show that collaboration entails the pulling together of ideas and expertise of individuals from different professional backgrounds to achieve a common objective. According to the American Library Association (2007) collaboration between faculty and librarians is fundamental to information literacy because:

- Collaboration is based on shared goals, a shared vision, and a climate of trust and respect. Each partner brings different strengths and perspectives to the relationship.
- The teacher brings an understanding of the strengths, weaknesses, attitudes and interests of the students, and of the content to be taught, and
- The librarian adds a thorough knowledge of information skills and methods to integrate them into the course, pedagogical knowledge for teaching these skills and an understanding of student's frustration with the research process.

Prior research, (Russell, 2002; Ivey, 2003; Mohktar, and Majid, 2006), shows that, collaboration between librarians and teaching faculty have long existed with positive results from such partnership in IL training. The report by Abubakar and Isyaku (2012) also favoured collaboration between faculty members and librarians, in the aspect of helping to develop active learning activities and assignment for students to engage the IL process. Graftein (2002) identified the role of the librarian as mainly teaching generic information skills while the faculty is responsible for imparting those skills that are embedded within the research paradigms and procedures of their disciplines. Mohktar and Majid (2006) also recommended that the teacher and librarian should work together to develop lesson units, plan student learning activities, identify and select appropriate learning resources. The authors added that these initiatives help to achieve a level of collaboration that has more instructional impact and educational value which is likely to be sustained.

Igbo and Imo (2017), explored the perception of the teaching faculty and librarians on collaboration as a strategy for imparting information literacy to the undergraduate students of Nigerian universities. The findings revealed that the teaching faculty and librarians perceive collaborative teaching as relevant means of improving students overall learning. While the librarians expressed readiness to collaborate with the teaching faculty in all the stages of the teaching process from lesson planning to evaluation of learning outcomes, the teaching faculty showed some sense of apathy with respect to entering into full collaboration with librarians in teaching especially in areas of lesson planning and evaluation. The authors concluded that the faculty does not either have full grasp of the procedures for developing student's information literacy or the contributions of the librarians in this regard. According to Ugu and Baro (2019), successful information literacy programmes will only be achieved only when libraries develop programmes collaboratively with teaching staff, where teachers serve as experts in content and context and librarians as experts in resources and processes.

Ivey (2003) investigated the partnership between librarians and academics in their efforts to develop students' IL skills at the University of Waikato, in New Zealand. The study revealed that the extent of effectiveness of IL programmes depended on the extent of understanding of parties on how the programme was developed and the provision of appropriate staffing resources to develop and deliver the programs. Also, the authors identified that effective communication and positive working relationships was among the conditions that were found to be essential to the success of collaboration between librarians and academics of the University. The study further reported that librarians were not involved in designing courses but were responsible for planning the information access and retrieval aspects of the IL learning programmes. Raspa and Ward (2000) mentioned five fundamental qualities that are required for IL collaboration to be effective. They include; passion, persistence, playfulness, project and promote.

Collaborations between librarians and teaching faculty is fundamental to achieving the goals of IL (ALA, 2007), however there are challenges to successful implementation. Igbo and Imo (2017) used mean scores to identify "faculty regarding the libraries as information store and librarians as book keepers, and not teachers" as a major collaboration challenge. Among challenges recorded by Ivey (2003) was the problem of insufficient resourcing to develop collaborative partnerships and information literacy programmes. Most of the academics mentioned that some of their colleagues are also interested in working with librarians to develop students' IL skills but that librarians' unmanageable workloads were a major concern of six academics. Another challenge identified by Abubakar and Isyaku (2012) was that librarians and faculty members differ in knowledge on how the knowledge is to be organised, shared and transferred to the students. In another instance, there are librarians and faculty

members who do not believe in enhancing the librarian-faculty partnership (Sanborn, 2005).

It is immediately noticeable from the above review of literature that collaborations between librarians and teaching staff of universities can work together to foster IL training in universities. Also noticeable is that most of the literature on IL collaborations have focused on such collaborations between librarians and members of some specific faculty or all the academic staff of a given university, there was no available literature on the collaboration between academic librarians and their counterparts who teach library and information science (LIS educators). This study intends to fill this gap.

Research Design/Methodology

Descriptive survey research design was adopted for this study. Using simple random sampling, five state universities offering LIS in Nigeria were selected. They are: Ambrose Alli University, Ekpoma, Benue State University, Makurdi, Imo State University, Owerri, Delta State University, Abraka and Osun State University Osogbo. The targeted population of the study is the LIS educators (lecturers in the Department of Library and Information Science) and librarians (professional library staff in the academic libraries). The total population from the five selected LIS schools was put at 41 LIS educators and 62 librarians making a total of 103.

Two sets of self-constructed questionnaires were created using Google Doc were the instruments used for data collection. The instrument was scrutinised by the researcher's senior colleagues to ensure face validity. The survey links are https://forms.gle/rKG7LiQS54uS8N6GA and https://forms.gle/XZ4DJmsY8r5QyLDd9 respectively. Seventy-seven copies of the instruments were distributed online using emails, while the researcher personally distributed the other 26 copies to respondents. After several reminder messages were sent the respondents, the researcher was able to retrieve a total of 69 (67%) copies of the questionnaire. For librarians, the response rate was 48 which represented (69.5%) and 21 (30.5%) for LIS educators. Data collection took five months, starting in October, 2019 to February, 2020. Data were analysed using percentage and mean with a criterion mean score of 2.50.

Table 1: Response Rate

Institutions	Librarians	LIS Educators	Total
Ambrose Alli University, Ekpoma	10	5	15
Benue State University, Makurdi	9	3	12
Imo State University, Owerri	10	4	14
Delta State University, Abraka	11	6	17
Osun State University Osogbo	8	3	11
Total	**48**	**21**	**69**

Source: Field work

Results

Level of Awareness of Librarians and LIS Educators of the Concept of IL

Three themes of IL are presented to librarians and LIS educators in a structured form to ascertain their understanding of the concept of IL. The analysis of the responses obtained from faculty and librarians is presented in Table 2.

Table 2: Awareness of IL Concepts

Concepts of IL	Librarians		LIS Educators	
	Agree	Disagree	Agree	Disagree
The Information Technology Concept	42 (87.5%)	6 (12.5%)	21(100%)	0 (%)
The Information Sources Concept	48 (100%)	0 (0%)	14 66.6%)	7(33.6%)
The Information Process Concept	44 (91.6%)	4 (8.4%)	15(71.5%)	6(28.5%)

As seen from the Table 2, all respondents have an overall high level of awareness of the concept of IL. All 48 (100%) librarians see IL from the information sources concept. The next accepted definition of the concept of IL by librarians is the information process concept where 44 (91.6%). The least accepted definition of IL by librarians is the information technology concept 42 (87.5%). For LIS educators, 21 (100%) accepted the information technology concept of IL. This is closely followed by the information process concept definition 15 (71.5%) and the least accepted definition was the information sources concept of IL 14 (66.6%).

Librarians/LIS Educators' Perception of the Core Skills that Students should Acquire from IL

Respondents were required to indicate their perceptions of the core skill that students should acquire from IL. Results are presented in Table 3.

Table 3: Perceptions of IL Skills

Core Skills	Librarians		LIS Educators	
	Agree	Disagree	Agree	Disagree
Articulate the specific information need	48 (100%)	0	21 (100%)	0 (0%)
Accesses needed information	48 (100%)	0	21 (100%)	0 (0%)
Evaluate information and its sources	48 (100%)	0	20(95.3%)	1 (4.7%)
Use information effectively	48 (100%)	0	21 (100%)	0 (0%)
Use information ethically and legally.	46 (96%)	2 (4%)	19(90.5%)	2 (9.5%)

Data in Table 3 revealed that the librarians and the LIS educators do not differ much in their perception of the skills that students are to possess after exposure to IL training. Both groups 100% of respondents regarded student's skills in articulating information need, accessing needed information and use of information effectively as core skills that students should possess from IL training.

Perception of Librarians towards Collaborating with LIS Educators to Promote IL

This question intended to elicit information on the perception of librarians towards collaborating with LIS educators to promote IL. Result is presented in Table 4.

Table 4: Librarians Perception of collaborating with LIS educators

	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean score
Collaboration will improve advocacy for IL at top university management meetings	16(33.3%)	16(33.3%)	11(23%)	5(10.4%)	2.89
Collaborating with LIS educators will make teaching IL more interesting, effective and enriching	15(31.3%)	16(33.3%)	8(16.6%)	9(18.8%)	2.77
Collaboration will help librarians become familiar with appropriate teaching techniques to promote IL	14(29.1%)	16(33.3%)	10(21%)	8(16.6%)	2.75
Collaborating will ensure increase manpower for teaching IL to students in the university	12(25%)	19(39.5%)	6(12.5%)	11(23%)	2.66
Collaboration will promote the sharing of ideas and expertise among librarians and LIS educators	15(31%)	12(25%)	10(21%)	11(23%)	2.64
Collaborating with LIS educators is unimportant because the library's human resources are sufficient for the teaching of IL	11(23%)	14(29.1%)	9(18.8%)	14(29.1%)	2.45
Collaborating will bring about confusion between librarians and LIS educators	8(16.6%)	11(23%)	17(35.4%)	12(25%)	2.31
Aggregate mean					**2.63**

The aggregate mean of 2.63 reveals that librarians have a positive disposition towards collaborating with LIS educators to promote IL. A total of 66.6% (2.89) of the librarians agree that collaboration will improve the advocacy for IL at top university management meetings. Another 64.6% agree that collaborating with LIS educators will make teaching IL more interesting, effective and enriching while 62.6% of the librarians agree that it will help them to become familiar with appropriate teaching techniques to promote IL. Most of the librarians also disagreed to the notion that collaborating with LIS educators was unimportant and that it will bring about confusion between librarians and LIS educators.

Willingness of LIS Educators to Collaborate With Librarians on IL

The extent of willingness of LIS educators to collaborate on promoting IL is shown in Table 5.

Table 5: Extent of Willingness of LIS Educators to Collaborate

Statements	**Strongly Agree**	**Agree**	**Disagree**	**Strongly Disagree**	**Mean score**
I am willing to collaborate with librarians because I understand the importance of IL to all students	8(38%)	10(48%)	-	3(14%)	3.09
I am willing to collaborate with librarians even though it will increase my work schedule	6(28.5%)	8(38%)	5(24%)	2(9.5%)	2.85
I am willing to collaborate with librarians because I am familiar with IL and I can easily teach it to students	9(43%)	2(9.5%)	4(19%)	6(28.5%)	2.66
I am willing to collaborate with librarians to teach IL if I will be remunerated for separately my work	5(24%)	5(24%)	8(38%)	3(14%)	2.57
I am willing to collaborate with librarians because I am certain that librarians alone cannot effectively teach IL to all the students in the university	3(14.3%)	7(33.3%)	7(33.3%)	4(19%)	2.42
I do not see any benefit working with librarians to teach IL	3(14%)	4(19%)	8(38%)	6(28.5%)	2.19
IL is the sole responsibility of librarians; I do not wish to get involved	3(14%)	5(24%)	13(62%)	-	1.90
Aggregate mean					**2.64**

Data in Table 5 shows the response of LIS educators towards the question of their willingness to collaborate with librarians to teach IL. It is seen that with an aggregate mean of 2.64, LIS educators are willing to collaborate with librarians. Firstly, because they perceive that they have a good understanding of the importance of IL to all students (3.09). They are also willing to collaborate even though they are aware that it might increase their work schedule (2.85) and because they feel that they are familiar with the concept of IL which makes it easier to teach students. Result also shows that the LIS educators disagree to the negative assertions in some of the items. For instance, with a mean score of (1.90) they disagree to the assertion of IL being the sole responsibility of librarians and that they do not wish to get involved. Also, they disagree to the statement that there will be no benefit if they work with librarians to teach IL (2.19). These implies that LIS educators have positive dispositions towards collaborating with librarians to teach IL.

Areas that librarians and LIS Educators can possibly collaborate in Promoting IL

Presented in Table 6 are the responses of the perception of librarians and LIS educators on areas of collaboration to promote IL in state universities.

Table 6: Areas of Possible Collaboration

	Librarians		LIS Educators	
	Agree	**Disagree**	**Agree**	**Disagree**
Actively participate in teaching IL courses	42(87.5%)	6(12.5%)	18(86%)	3(14%)
Actively participate in planning of IL curriculum	41(85.4%)	7(14.6%)	15(71.4%)	6(28.6%)
Actively participate in providing practical IL sessions to students	42(87.5%)	6(12.5%)	12(57%)	9(43%)
Actively advocate for IL in faculty and senate meetings	12(25%)	36(75%)	15(71.4%)	6(28.6%)
Actively participate in the creation of students, IL competency assessment tool	42(87.5%)	6(12.5%)	14(66.6%)	7(33.3%)
Actively participate as an instructor and team member in designing, teaching and implementing course assignments	41(85.4%)	7(14.6%)	10(47.6%)	11(52.3%)
As facilitators of Symposiums/workshops organized for students to focus on specific issues related to IL that students face today (e.g. plagiarism and referencing issues).	40(83.3%)	8(16.6%)	11(52.3%)	10(47.6%)
Actively participate collaborating in developing lesson plan for IL	39(81.3%)	9(18.7%)	14(66.6%)	7(33.3%)
Actively participate in planning students' learning activities for IL	40(83.3%)	8(16.6%)	9(43%)	12(57%)
Actively participate in identification and selection of appropriate IL learning resources	42(87.5%)	6(12.5%)	9(43%)	12(57%)
Actively collaborate in assessing students' learning outcome.	41(85.4%)	7(14.6%)	14(66.6%)	7(33.3%)

Response from Table 6 revealed that while there are areas of collaboration similar to both groups of respondents there are also aspects where their responses varied. Librarians and LIS educators equally agreed to the possibilities of collaboration in areas such as teaching IL courses together, providing practical IL sessions to students and in planning of a curriculum for IL. In the aspect of advocating for IL in faculty and senate meetings, more LIS educators 15(71.4%) are willing to collaborate than librarians 12(25%). Also, more librarians 40(83.3%) than LIS educators 9(43%) are willing to collaborate planning students' learning activities for IL.

Perceived Challenges to Collaborations between Librarians and LIS Educators

Result in Table 7 represents the opinion of both groups of respondents about their perceived challenges to collaborations.

Table 7: Perceived Challenges to Collaborations between Librarians and LIS Educators

Perceived Challenges by LIS educators	Librarians		LIS Educators	
	Agreed	Disagreed	Agreed	Disagreed
University's reluctance in accepting the integration of IL into the academic curriculum	41(85.4%)	7(914.6%)	20(95.2%)	1(4.8%)
The belief that teaching IL is the sole responsibility of librarians	14(29%)	34(71%)	6(28.5%)	15(71.5%)
Inadequacy of time to plan for and teach IL	13(27%)	35(73%)	12(57%)	9(43%)
Non-acceptance of Librarians as academic equals by the LIS educators	34(71%)	14(29%)	9(43%)	12(57%)
Lack of understanding of what teaching IL actually entails	26(54%)	22(46%)	13(62%)	8(38%)
Lack of interest in IL	17(35.4%)	31(64.5%)	12(57%)	9(43%)
Inadequacy of skills to teach in IL	28(53.4%)	20(41.6%)	14(66.6%)	
Librarians unwillingness to collaborate with LIS educators in the teaching of IL	13(27%)	35(73%)	17(81%)	4 (19%)
LIS educators' unwillingness to collaborate with librarians in the teaching of IL	29(60.5%)	19(39.5%)	7(33.3%)	14(66.6%)
Inadequacy of staff to teach IL	31(64.5%)	17(35.4%)	15(71.4%)	6(28.6%)
Inadequacy of facilities to teach IL	42(87.5%)	6(12.5%)	18(86%)	3(14%)

Evidence from Table 7 shows that most of the issues raised as challenges were highly rated by the librarians and the LIS educators. The table also shows the challenges as perceived by both groups of respondents. For librarians, the highest ranked challenge is the inadequacy of facilities to teach IL 42 (87.5%), followed by their perception of their university's reluctance to accept the integration of IL into the academic curriculum 41(85.4%). Another challenge as perceived by librarians is that LIS educators do not accept them as equals in the academic field 34 (71%). On the part of LIS educators, their highest ranked challenge is also their perception of their university's reluctance to accept the integration of IL into the academic curriculum 20 (95.2%), Next to this is inadequacy of facilities to teach IL 18 (86%) and a perception that librarians are might be unwilling to collaborate with them in the teaching of IL 17 (81%).

Discussions

The level of awareness of the concept of IL by librarians and LIS educators were sought in this study. Results show a high level of awareness among librarians and LIS educators. Their definition fit into the accepted major conceptions of IL. Mostly the summary provided by Boekhorst (2003) that IL has the ICT concept, the information (re)sources concept, and the information process concept. The result also reveals that where librarians believe more in the information sources concept of IL. This concept focuses on finding information located in information sources, knowing the right information resources, how and where to obtain the information and lastly, on the competence to find and use information independently to solve problems. For LIS educators, it is more of the information technology concept of IL, where the focus is more the use of information technology for information retrieval and communication, getting the necessary skills to easily use computers and Internet and the use ICT to retrieve and disseminate information. Although both conceptions are among the popularly accepted conception in the IL literature, there is need to point out this slight difference in perceptions of the concept of IL between librarians and ILS educators because it is believed that for successful collaboration to take place there is need to display a similar understanding of IL between the collaborating parties so as to ensure that a holistic approach to IL is adopted. In this case it is believed that the perceived conceptions will enable students to benefit more from the collaboration to promote IL in state universities. This finding

supports the definition of IL by (ACRL) (2016) that the concept is "the set of integrated abilities". This integrated ability ranges from finding of information, its sources and Bruce (2003), who observed that the complexities of the ICTs have brought about the realisation that students need to engage with the information environment as part of their formal learning process. This finding is also in agreement with a similar study done by Anyaoku (2016) that found that librarians conceptualised information literacy as a meta competence involving different information skills and abilities.

The aim of the second research question was to reveal librarians and LIS educators' perceptions of the core skill that students should acquire from IL. The results show that their perceptions of the core skills that students should acquire from IL are similar. For both groups of respondents, students' skills in articulating information need, accessing needed information and use of information effectively were perceived as the core skills that students should possess from IL training. This finding is in line with the submission of the most important skills students should possess listed by the University of South Carolina (2018), which include knowing when information is required (information need), knowing where to find the information (accessing information) and knowing how to organise information and consolidate all of this information (use of information). Similarly, the result provides evidence for the core skills that should be the main focus of IL when teaching students. This finding is supported by the result of Flywel and Jorosi (2018), that identifying diverse information resources was a skill that students at the University of Livingstonia in Malawi needed because they had problems with it.

Librarians see collaborating with LIS educators as an effective means of improving the advocacy for IL especially to top university management as well as a way to make teaching IL more interesting, effective and enriching. Most of them also believe that collaboration will enable them become familiar with appropriate teaching techniques. Thus, implying that collaborations between librarians and LIS educators will provide the opportunities for librarians to improve on their own teaching techniques. Also evident from the result is that most librarians rejected the negative notions that collaborating with LIS educators was unimportant and might bring about confusion between librarians and LIS educators. It is safe to assume that librarians are favourably disposed to the idea of collaborations and believe that it will promote IL. This finding is in line with the submission made by Bruce (2002) that collaboration fosters the sharing of ideas, expertise and provides opportunities for exposure as well as enabling different professionals to be familiar with each other's field.

LIS educators were found to be willing to collaborate with librarians to promote IL in the state universities. They expressed willingness despite the understanding that collaborating to teach IL might mean increased work schedule. Willingness is also evident in their agreement to comments such as the fact that their familiarity with the concept of IL will make it easy for them to teach it to students. Some of the educators also indicated their willingness based on remuneration for the extra work. They equally disagree to some negative assertions that IL is the sole responsibility of librarians hence the idea of not wanting to get involved was rejected. Also rejected was the assertion that there will be no benefit if they work with librarians to teach IL. The overall implication of this is that LIS educators have positive dispositions towards collaborating with librarians to teach IL. These results are in agreement with the finding of Ivey (2003) when she reported that faculty members at University of Waikato, in New Zealand displayed willingness to collaborate through their Like-mindedness, commitment, enthusiasm and innovation, while others spoke of their enthusiasm for working together, particularly when they were exploring new ways of teaching and learning. On the contrary, this result is in disagreement with the finding of Igbo and Imo (2017), that the teaching faculty showed some reservations with partnering with librarians in teaching IL because they did not either have full grasp of the procedures for developing student's information literacy or the contributions of the librarians.

According to Ugu and Baro (2019), successful IL programmes will only be achieved only when libraries develop programmes collaboratively with teaching staff. The study participants were found to be highly agreeable on most of the areas that they can collaborate. Areas of collaboration that were similar are the teaching IL courses together, providing practical IL sessions to students and planning of an

IL curriculum. Librarians were more interested than LIS educators to collaborate in other areas such as the creation of student's IL competency assessment tool, instructors and team members in designing, teaching and implementing course assignments, being active facilitators of symposiums/workshops where students can focus on specific issues related to IL like plagiarism and referencing issues and planning students learning activities for IL. Whereas, the only aspect that found LIS educators more interested than librarians was in the aspect of advocating for IL in faculty and senate meetings. That LIS educators are willing to collaborate in this aspect may be attributed to the fact that they are more likely to attend such meetings more than librarians and this gives them a better position to advocate and get approvals from management on IL issues. These findings go on to highlight the advantages that collaboration can bring to the teaching of IL in state universities because, it shows that both groups are capable of complimenting each other to promote IL. The result confirms earlier finding by Mohktar and Majid (2006), that the teacher and librarian can work together to develop lesson units, plan student learning activities, identify and select appropriate learning resources. Abubakar and Isyaku (2012), where they also favoured collaboration between faculty members and librarians, in the aspect of helping to develop active learning activities and assignment for students to engage the IL process.

The study revealed that most of the issues raised as challenges were highly rated by the librarians and the LIS educators. A major concern as revealed by librarians and LIS educators are inadequacy of facilities to teach IL and a perceived reluctance on the part of the university's management in integrating IL into the academic curriculum. For librarians, another perceived challenge is the non-acceptance of librarians as academic equals by the LIS educators and a lack of understanding of what teaching IL actually entails. For LIS educators, inadequacy of time to plan for and teach IL as well as lack of interest in teaching IL are some other challenges. Also revealed is an interesting perception from both groups of an unwillingness by each other to collaborate. Librarians perceive that LIS educators might not want to collaborate with them and LIS educators presume the same thing that librarians might not be willing to collaborate with them. While the specific reason for these differing perceptions between librarians and LIS educators about each other's willingness to collaborate may not have been investigated, however the result is an indication of the possibility of miscommunication between both groups and it can be a risk to successful collaboration in teaching IL programs. These issues would be worthy of further investigation, especially if collaborative formal IL programmes are to be developed in state universities in Nigeria. The major perceived challenges to collaboration between librarians and LIS educators as revealed by these results. This study agrees with the report of Igbo and Imo (2017) where they observed that faculty staff regarded librarians as book keepers, and not teachers as a major collaboration challenge.

The findings presented from this study sheds light on the possibility that collaboration between librarians and LIS educators will be effective in helping to promote IL in Nigerian universities. There is evidence of high awareness of IL concept, similarity of opinion of the core skills that students should have from IL training, as well as high level of willingness from both groups to collaborate concerning IL Training. University management should see the need to re-design IL policies in their institutions to create conducive collaboration environment and also to support information literacy programmes by way of providing inadequacy of facilities to teach IL.

Conclusion

The need for this study arose from a lack of available literature on the perception of librarians and LIS educator's collaboration to promote IL programmes. The study has highlighted that the level of awareness of the concept of IL is high among librarians and LIS educators. Where librarian's sees IL more from the information (re)sources concept, LIS educators favoured the information technology concept more. This is believed will invariably enhance a more holistic collocation between librarians and LIS educators. The librarians and LIS educators share a similar opinion of the core skills that students should have from IL. For librarians and LIS educators there was an evident willingness to collaborate on IL and the paper identified some similarities and differences in the areas where librarians and LIS educators are willing to collaborate in the promotion of IL.

Perceived challenges to successful collaboration were also highlighted relating from inadequacy of facilities to teach IL, reluctance in having IL in the university's curriculum and an unfounded fear of unwillingness to collaborate from both librarians and LIS educators.

Finally, it can be concluded that collaboration will promote IL in state universities, and since librarians and LIS educators have similar perception about collaboration, both groups can be call upon to complement each other so that the common goal of promoting IL in state universities can be achieved. Therefore, the study is a snapshot of the possibility of a successful collaboration between librarians and LIS educators.

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Research Partnerships that Count in Sub Saharan Africa's Research Output and Impact: A Bibliometrics Study of Selected Countries, 2000-2019

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Abstract

The purpose of this paper is to examine the extent to which selected countries in sub-Saharan Africa benefit from their research collaboration with other countries, with special focus on countries outside Africa. Data was obtained from the Web of Science's (WoS) citation databases using the country name in a search query CU=Country Name and limiting the search to research articles published between 2000 and 2019. The VOSviewer was used to map the country collaborations in the five sub-Saharan African countries, which were selected for the study, namely Ethiopia, Ghana, Kenya, Nigeria and Tanzania. The findings reveal that the number of collaborating countries has not only increased since 2000 but also that the intensity of collaboration among countries has tremendously grown over time. The USA and England contribute the most to the five countries' research performances and therefore constitute the core country contributors. The collaborators' contribution to the five countries is close to being proportional but greatly differs in terms of percentage share across the five countries. The greatest beneficiary of regional (hereinafter used to refer to 'Africa' or 'African') and international collaboration is Kenya, followed by Nigeria, Ghana, Tanzania and Ethiopia. The collaboration among researchers from different countries is likely to intensify as many governments and funders place more emphasis on research collaboration. Given the current increased interest in university rankings, institutions in sub-Saharan Africa are likely to encourage their researchers to engage in collaborative research that benefits the institutions the greatest.

Keywords: *Research Collaboration, sub-Saharan Africa, Bibliometrics, Citation Impact*

Introduction

The notion that research collaboration bears benefits is globally acknowledged. The published literature is replete with evidence of the drivers and value of research collaboration between and among individual researchers, organisations and countries. An examination of the factors that necessitate research collaboration partially offers glimpses into the anticipated benefits of collaboration. For instance, Cozzens *et al* (2011) and Duque *et al* (2005) have delineated the drivers of research partnerships to include increased specialisation across disciplines and fields, access to expensive instruments or rising costs of technological apparatus, complexity of research problems, growth of interdisciplinary, development of new information and communication technologies, and career advancements. Individual-based characteristics that inform decisions on research partnerships include educational background, academic affiliation and prior innovation output as well as work experience (Okamuro, Honjo and Kato 2013). In their study on the determinants of research collaboration modes, Jeong, Choi and Kim (2011) found that "informal communication, cultural proximity, academic excellence, external fund

inspiration, and technology development levels play significant roles in the determination of specific collaboration modes, such as sole research, internal collaboration, domestic collaboration, and international collaboration". The underlying rationale for research collaboration is therefore anchored in the need to overcome some of the hurdles that are associated with sole research undertakings, such as those outlined above.

On the other hand, the overarching persuasion to engage in research collaboration is based on perceived benefits of research partnerships (Bradley 2008). The benefits can be in the form of outcomes, deliverables, and products (Bourke 2013). Specifically, the benefits include improved research performance (Sooryamoorthy 2017), strengthening of research capacity in countries (Volmink and Dare 2005; Spence *et al.* 2016), improving researchers' abilities and performance (Confraria, Blanckenberg and Swart 2019) and increasing research impact (Katz and Hicks 1997). The most commonly cited benefit, however, is alluded to by many scholars who argue that researchers conduct and publish their researches in anticipation of impact (Roberts, Madden and Corrall 2013); Hanard 2001; Beamish 2006; Alzahrani 2010; and Harnad, Carr and Brody 2001). In fact, it has been observed that, depending on the type of collaboration, co-authored papers increase the citation rates way above single-authored papers (see Smart and Bayer 1986; Gazni and Didegah 2011; Katz and Hicks 1997; Sooryamoorthy 2017). It therefore follows that research collaboration increases research productivity (outputs) and citation impact. This overarching benefit is very important, particularly in view of the prevailing focus on ranking systems for universities and, by extension, countries. One of the fundamental indicators that are considered in the global university ranking systems is research output and citation impact (Hossain and Ahmed 2020), and as such any contributions of one country to another in terms of the number of publications and citation impact as a result of research collaboration boost the ranking of the research partners. Hence, this paper quantitatively investigates the extent to which selected countries in sub-Saharan Africa benefit from their research collaborations, with special reference to international collaboration.

Related Studies

Do all research collaborations count? It has been observed that collaboration and its benefits vary across countries (Glanzel 2001; Must 2012; Puuska, Muhonen and Leino 2014) as a result of geographical, linguistic, cultural, political and geopolitical factors (Glanzel 2001), disciplines or fields of study (see Bote, Olmeda-Gómez and Moya-Anegón 2013) and language differences, complex management structures, and inequitable access to financial resources, libraries, conferences, training, and publishing opportunities (see Bradley 2008). Bradley (2008) further notes that "mismatched expectations, lack of face-to-face interaction, and different levels of methodological sophistication" may compromise the maximisation of benefits accruing from research collaboration. Despite the fact that many scholars have noted that international collaboration counts more in terms of publications output and impact than domestic and regional collaboration, there are variations in the extent of the international community's contributions to productivity and impact in domestic research (Katz and Hicks 1997; Pouris and Ho 2014; Sooryamoorthy 2017; Puuska, Muhonen and Leino 2014; Chen, Zhang and Fu 2019). For example, Goldfinch, Dale and DeRouen (2003), in their study on science from the periphery, observed that countries that occupy the periphery benefited the most from international collaborations. The authors further noted that domestic collaboration yielded negative relationships as far as their citation count and impact was concerned. It has also been noted that low-impact countries significantly benefit more than the high-impact countries from international collaboration (Bote, Olmeda-Gómez and Moya-Anegón 2013). The key findings in the study, conducted by (Bote, Olmeda-Gómez and Moya-Anegón 2013), which partially mirrors the trajectory of the current study, are:

- the more countries there are involved in the collaboration, the greater the gain in impact;
- the scientific impact of a country does not significantly influence the benefit it derives from collaboration but does seem to positively influence the benefit obtained by the other countries collaborating with it.
- the countries with the highest impact were clear

outliers, tending to provide proportionally more benefit to their collaborating countries than they themselves obtained.

In Africa, Onyancha and Maluleka (2011), in their study on *knowledge production through collaborative research in sub-Saharan Africa: how much do countries contribute to each other's knowledge output and citation impact?* noted that, although the contributions of sub-Saharan African countries to each other's total research papers was low, countries belonging to the same geographic region tended to benefit each other more than they did with countries outside their regions. The aforementioned authors concluded that geographical proximity of sub-Saharan African countries played a big role in knowledge beneficiation among the countries. South Africa contributed the greatest number of publications to Zimbabwe and Botswana while in the East Africa region, Kenya was the biggest contributor to Uganda and Tanzania. South Africa's collaboration with the majority of the countries in the region was attributed to its high-ranking educational institutions which have attracted post-graduate students from other African countries. In terms of citation count and impact, Onyancha and Maluleka's (2011) study reported that most countries contributed very little (that is, less than 1% of total citations) to each other's citation performance, with South Africa contributing the most to Zimbabwe and Botswana; in a similar manner as it did in terms of the number of publications. In other words, the countries' co-authorship of publications with each other did not result in substantive benefits in terms of improving citation counts and impact.

In a more recent study, Onyancha (2020) used a social network analysis to assess, among other aspects, the contributions of the global north and global south to the research output and impact of five countries in sub-Saharan Africa and noted that the global north contributed more publications and citations than the global south. Onyancha (2020), without naming the collaborating countries, observed that the global north contributed the most in terms of publications and citation impact to the selected countries in sub-Saharan Africa. However, the study fell short of addressing the contributions of individual countries to the regional countries. Finally, the participation and contribution of the international scientific community to research in sub-Saharan Africa has received widespread attention, as reflected in the published literature (see Adams, Gurney, Hook and Leydesdorff 2014; Pouris and Ho 2014; Sooryamoorthy 2017; Onyancha 2020). The number of countries that collaborate with sub-Saharan African countries in both the regional and international arena has increased in the recent past, resulting in the formation of several clusters and increased international network linkages for sub-Saharan African countries (Onyancha 2020). Most of these studies, which are largely limited to specific countries and/or disciplines (e.g. Asubiaro and Badmus 2020; Onyancha 2018; Boshoff 2009; Ettarh 2016; Fari and Ocholla 2015; Maluleka and Onyancha 2016; Mouton 2000; Owusu-Nimo and Boshoff 2017; Sooryamoorthy 2011) have identified the collaborating countries but not the extent of their collaboration.

Problem Statement and Purpose of Study

The demand for efficient 'value-for-money' research has resulted, to some extent, in researchers and their affiliate institutions (largely universities) to search for strategic and external partnership support in what Robertson (2010), as cited in Bourke (2013: 501) has termed as the 'new public managerialism' (RPM). The phrase 'value-for-money' research is often associated with impactful research – i.e. research that makes great contribution to academia, society and economy. The search for strategic research partnerships to achieve greater research impact can be said to be anchored in the United Nation's (UN) Sustainable Development Goals (SDGs) and more specifically *Goal 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development*. Of particular interest and relevance to the current study are the following scientific collaboration-linked targets:

(a) Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms.

(b) Promote the development, transfer, dissemination and diffusion of environmentally

sound technologies to developing countries on favorable terms, including on concessional and preferential terms, as mutually agreed.

As highlighted above in the section on literature review, sub-Saharan Africa already enjoys wide research networks, as reflected in the geographic dispersion and the number of countries with which the countries in the region collaborate in research. What is, however, unclear and therefore constitutes the research problem and the focus of this study is: how much is the scientific community's collaboration worth for sub-Saharan African countries in terms of scientific outputs and impact? This research problem revolves around the following specific and interrelated sub-questions:

- Which countries benefit the regional countries the most, in terms of research publications and citation impact as well as collaboration networks?
- By how much does each of the foreign countries improve research output and impact in sub-Saharan African countries?
- Which of the local countries benefit the most from its research partners?
- Do the collaborating partners contribute proportionately across the regional countries?

Research Methodology

The search for relevant data was conducted on 3 February 2020 from the Web of Science's (WoS) three citation indexes – that is, the Science Citation Index (SCI), Social Science Citation Index (SSCI) and Arts and Humanities Citation Index (AHCI). The search, which was limited to research articles published between 2000 and 2019, was conducted using the name of the country in the search query, in the format *CU="country name"*, where country name stands for the name of a country. The countries that were selected for the study were Ethiopia, Ghana, Kenya, Nigeria and Tanzania. These countries are among the top-ranked countries in sub-Saharan Africa in the Scimago country ranking system. South Africa, which is ranked first in the region, was excluded from the study because the country's nature, pattern and extent of research collaboration has been extensively investigated (e.g. Mouton 2000; Sooryamoorthy 2009; Sooryamoorthy 2015. Sooryamoorthy 2017). Furthermore, South Africa produces more than one quarter of all publications in Africa and more than one third of publications in sub-Saharan Africa (Sooryamoorthy 2015), a situation that could have resulted in skewed results.

Data was downloaded and saved in text format (that is, .txt) to conform to the VOSviewer software, which was used to analyze the data. The full bibliographic record was considered the most appropriate format to extract the data. Each record contained the following information: author, title, keywords, author address, abstract, source [journal], language of publication, and cited references. The VOSviewer software that was used to analyse the data provides three options to analyse co-authorships, namely individual authors, institutions or countries. This study focuses on country collaborations, and as a result, the unit of co-authorship analysis was 'country'. All countries and geographical regions were included in the mapping of the collaboration networks for each country under investigation. The VOSviewer visualisation of the data yielded the following data, which was deemed necessary for the study:

- Country name – Collaborating country
- Cluster – A cluster of countries is formed where two or more countries are closely associated in their collaboration
- Links (L) – the number of co-authorship links of a given country with other countries
- Total link strength (TS) – the total strength of the co-authorship links of a given country with other countries
- Number of papers (P) – Number of papers published by researchers in a given country
- Number of citations (C) – Number of citations received by the papers published by researchers in a given country
- Normalized citations (NC) – The total normalised number of citations received by all documents published by researchers in a country

Whereas the links and link strength reflected the contributions of the collaborating countries in terms of the size of their individual networks, the number of papers and citations (including normalised citations) reflected the countries' contributions in terms of research output and citation impact.

Percentages of Country A's contribution to Country B's output and impact (that is x as a percentage of y, where x is country A's publications or citations and y is County B's publications or citations), ranking the countries according to various indicators (using Microsoft's Excel rank syntax Rank= (Number, Ref, [order])), correlation coefficients (using Pearson correlation analysis in Microsoft Excel's Data Analysis Tool), and mean scores (using Microsoft Excel formula to calculate the Average scores) were computed to assess the extent of a country's contribution to each of the five selected countries. The assessment was based on the number of papers, links, link strength, citations and normalized citations.

For purposes of examining whether or not the countries' contributions are proportional across the selected countries, a Pearson correlation test was conducted while ranking the countries according to their percentage contributions was conducted using the Excel Rank function. Unless otherwise explicitly explained, the presentation of data according to countries is not based on the countries' ranking in global ranking systems but according to the alphabetical order.

Results and Discussion

Tables 1 and 2 offer the top 30 benefactors for the selected countries under investigation. As the two maps show, research collaboration in the five countries has become denser in 2015-2019 than it was in 2000-2004. Figure 1 consisted of seven clusters, 2156 links and 14229 total link strength, while Figure 2 comprised 11 clusters, 7947 links, and 184481 total link strength.

The collaboration activity in the five countries has therefore more than doubled between the two time periods, especially when we consider the number of links and total link strength. This pattern is clearly illustrated in Table 1 and Table 2, which provide the clusters of individual country collaborators and their number of links, total link strength, papers and citations.

The top of both tables are the countries that were the subject of this paper's investigation (i.e. Nigeria, Kenya, Ethiopia, Tanzania and Ghana). When these countries are excluded, the USA becomes the most active participant in the five countries' research activities. The USA yielded posted the most number of links (170), link strength (14430), papers (5805), citations (196428) and normalised citations (10839.20) in 2000-2004 while its performance between 2015 and 2019 was as follows: links (191), link strength (30194), papers (10225), citations (91481), and normalised citations (15585.06). Other countries that contributed in a big way to the five countries' research performance and collaboration networks include England, Germany, Netherlands, Switzerland, Belgium and Sweden.

Table 1: Top 30 collaborating countries in research in selected countries in sub-Saharan Africa, 2000-2004

No	Country	Cluster	L	TL	P	C	NC
1	Nigeria	4	149	7818	10719	124726	6868,39
2	Kenya	3	168	12465	6478	178546	9798,27
3	USA	3	170	14430	5805	196428	10839,20
4	Ethiopia	3	137	4858	3850	69350	3872,22
5	England	3	159	10048	3494	127635	7037,69
6	Tanzania	3	148	6856	3442	84893	4697,31
7	Ghana	3	143	4989	2944	62953	3488,59
8	South Africa	4	139	5826	2031	60819	3365,96
9	Germany	3	141	4284	1503	46469	2613,61
10	Netherlands	3	135	4175	1219	43665	2411,71
11	Switzerland	3	141	3612	833	37191	2038,18
12	Belgium	1	124	3132	824	30278	1659,36
13	Sweden	3	119	2296	766	21726	1217,35
14	India	1	127	2987	765	37120	2051,34
15	Canada	3	123	2314	742	27836	1561,59
16	France	1	145	3590	733	30288	1660,90
17	China	1	121	2657	698	26910	1503,76
18	Australia	1	136	3100	664	32481	1794,80
19	Uganda	3	119	2508	628	22167	1207,21
20	Italy	1	132	2751	581	23183	1298,54
21	Japan	1	120	2035	548	17908	985,89
22	Norway	3	99	1158	500	12618	718,57
23	Scotland	3	106	1560	469	18855	1040,80
24	Denmark	3	115	1511	453	13512	751,70
25	Spain	1	123	2296	391	22866	1246,04
26	Brazil	1	125	2218	332	21441	1190,32
27	Malaysia	4	104	754	326	6940	394,04
28	Cameroon	2	97	1150	257	7255	400,77
29	Austria	1	115	1195	253	10378	573,32
30	Thailand	2	109	1223	214	18388	1013,18

Another observation that can be made is in regard to the clusters, which reveals that there have been some shifts since the early 2000s. Countries that belonged to the same cluster/s in the 2000-2004 period have shifted to other clusters implying evolving partnerships among researchers in the said countries. Tables 1 and 2 further reveal that only three African countries (i.e. South Africa, Uganda, and Cameroon) featured among the top 30 countries with which Ethiopia, Ghana, Kenya, Nigeria and Tanzania collaborated, implying most of the top contributors to the five countries' research performance were foreign countries.

The tail end of the two lists of countries and/or regions that collaborate with the five sub-Saharan African countries, in terms of their publication outputs, for the periods 2000-2014 and 2015-2019 consists of small countries/regions that co-produced

one or two articles each with at least one of the countries in the region. Tables 3 provides the countries or regions that yielded one paper each in the two time periods. However, some of them posted impressive performance in terms of their number of links, total link strength and citation impact (i.e. number of citations and normalized citations). For example, Armenia and Kosovo (international) and Comoros (regional) had over 20 links each while Surinam, Greenland, and Kyrgyzstan yielded over 120 total link strength, meaning that a country may have contributed little towards another country's publication output, but much more in terms of collaboration networks and citation impact. Table 3 further shows that the number of countries or regions co-publishing one paper each with the five countries has declined from 18 in 2000-2004 to 11 in 2015-2019.

Table 2: Top 30 collaborating countries in research in selected countries in sub-Saharan Africa, 2015-2019

No.	Country	Cluster	L	TL	P	C	NC
1	Nigeria	5	179	20021	16011	74432	14836,48
2	USA	8	191	30194	10225	91481	15585,06
3	Kenya	7	185	23464	9874	75935	12535,89
4	Ethiopia	8	165	12398	8581	42455	8014,21
5	Ghana	2	169	12084	6851	36630	6724,32
6	England	3	186	21382	6147	59323	10351,65
7	Tanzania	2	167	11751	5082	35082	5893,02
8	South Africa	4	173	14647	4628	37454	6799,34
9	Germany	9	165	10450	2854	28256	5021,01
10	China	1	153	8252	2599	23875	4783,26
11	Netherlands	8	162	8205	2068	23984	3965,94
12	Australia	2	171	9318	1909	25638	4396,74
13	Canada	3	166	7777	1746	22728	3831,67
14	India	1	166	7505	1741	21729	3935,71
15	Switzerland	11	173	8189	1592	20744	3621,16
16	Belgium	4	146	5837	1385	14972	2483,70
17	Sweden	3	143	5327	1346	15647	2479,20
18	Malaysia	5	134	3219	1335	8335	1766,65
19	France	7	161	7876	1330	17123	3114,82
20	Uganda	2	148	5368	1185	10322	1778,48
21	Italy	1	153	6033	1106	13732	2386,97
22	Scotland	3	141	4341	981	11312	1981,65
23	Japan	9	139	4032	938	10936	1749,59
24	Norway	7	131	3171	899	8944	1589,92
25	Denmark	4	130	3618	846	12713	1955,71
26	Spain	3	149	5277	838	13166	2073,94
27	Brazil	1	160	5367	765	14179	2464,65
28	Pakistan	1	125	2469	507	6258	1385,75
29	Saudi Arabia	1	111	1991	498	5195	987,22
30	Cameroon	2	130	2475	490	4246	869,60

Table 3: Least country contributors to the research performance of selected countries in sub-Saharan Africa, 2000-2004 and 2015-2019

No.	Country	Cluster	L	TL	P	C	NC
	2000-2004						
1	Armenia	1	23	23	1	13	0,90
2	Bhutan	1	2	2	1	6	0,29
3	Cape Verde	2	10	10	1	21	1,10
4	French Guiana	2	10	10	1	24	1,35
5	Greenland	3	14	14	1	138	6,63
6	Kosovo	1	22	22	1	36	2,48
7	Kyrgyzstan	2	7	7	1	120	6,77
8	Maldives	1	17	17	1	11	0,58
9	Micronesia	1	6	6	1	3	0,14
10	Montenegro	1	9	9	1	41	1,97
11	Neth Antilles	3	4	4	1	38	1,99
12	North Korea	1	18	18	1	25	1,29
13	Sao Tome and Prin	1	3	3	1	21	1,10
14	St Vincent	4	2	2	1	25	1,31
15	Surinam	2	8	8	1	143	7,35
16	Tonga	1	5	5	1	40	2,09
17	Tuvalu	2	10	10	1	69	3,61
18	Vanuatu	2	12	12	1	46	2,60
	2015-2019						
1	Antigua and Barbu	1	12	12	1	5	1,64
2	British Virgin Isl	4	15	15	1	1	1,19
3	Cayman Islands	2	8	8	1	18	2,03
4	Comoros	1	24	24	1	2	2,37
5	Cook Islands	6	5	5	1	1	0,11
6	Liechtenstein	11	2	2	1	3	0,98
7	Neth Antilles	8	3	3	1	11	0,92
8	Niue	6	5	5	1	1	0,11
9	North Korea	2	11	11	1	9	1,54
10	Reunion	7	2	2	1	10	1,13
11	Tonga	6	4	4	1	62	5,16

When we excluded the focal countries (i.e. Ethiopia, Ghana, Kenya, Nigeria and Tanzania) from the analysis of collaborating countries, so as to gauge each collaborating country's unique contribution, it was noted that the number of links, link strength, papers, citations and normalized citations reduced drastically. However, when we ranked the collaborating countries according to their unique percentage share of the regional countries' performance using the five indicators, we observed that the USA was the topmost country in all but two countries, namely Nigeria and Tanzania, where the USA was ranked in the second position after England, in terms of links in each case. Similarly, England was

largely ranked the second most contributing country outside of Africa (Table 5) with exceptions being in Ethiopia (links), Nigeria (links and papers) and Tanzania (links). The other top-ranked countries were the Netherlands, and Germany. These countries could be said to be the core contributors to the five countries' research performance. Evidently, the positions taken by each of the countries below England were more fluid than it was the case with the USA and England. In the ranking of the regional countries, South Africa topped the list of the main contributors to the five countries' research performance, followed by Uganda, Cameroon, Malawi, and Burkina Faso (Table 6).

Table 4: Correlation of collaboration performance of all countries across five regional countries

		ET					*GH*					*KE*					*NG*				
		L	TL	P	C	NC	L	TL	P	C	NC	L	TL	P	C	NC	L	TL	P	C	NC
ET	L	1.00																			
	LS		1.00																		
	P			1.00																	
	C				1.00																
	NC					1.00															
GH	L	0.87					1.00														
	LS		0.92					1.00													
	P			0.93					1.00												
	C				0.94					1.00											
	NC					0.95					1.00										
KE	L	0.89					0.91					1.00									
	LS		0.95					0.94					1.00								
	P			0.93					0.97					1.00							
	C				0.95					0.97					1.00						
	NC					0.96					0.97					1.00					
NG	L	0.90					0.91					0.91					1.00				
	LS		0.86					0.86					0.87					1.00			
	P			0.86					0.92					0.90					1.00		
	C				0.92					0.92					0.93					1.00	
	NC					0.94					0.93					0.93					1.00
TZ	L	0.82					0.85					0.87					0.81				
	LS		0.92					0.91					0.94					0.78			
	P			0.90					0.92					0.95					0.83		
	C				0.93					0.94					0.96					0.87	
	NC					0.92					0.94					0.96					0.86

Key: ET- Ethiopia, GH-Ghana, KE-Kenya, NG-Nigeria

Table 5: Ranking the international country contributors to the selected countries' research performance

		Ethiopia				**Ghana**				**Kenya**				**Nigeria**				**Tanzania**				**Ranking**	
No.	Coll Country	L	TL	P	C	L	TL	P	C	L	TL	P	C	L	TL	P	C	L	T L	P	C	World	Interna-tional
1	USA	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1
2	England	1	2	2	2	2	2	2	2	2	2	2	2	1	2	3	2	1	2	2	2	2	2
3	Netherlands	4	3	4	3	13	11	5	5	12	4	5	4	8	4	15	6	8	8	8	6	4	3
4	Germany	3	6	3	4	8	5	4	3	8	6	4	5	9	12	5	5	11	14	20	18	5	4
5	Switzerland	9	8	15	10	6	6	9	7	4	10	10	8	11	9	16	15	4	3	6	4	6	5
6	Australia	14	16	12	13	3	8	8	9	8	9	12	7	10	10	9	13	18	12	14	15	7	6
7	France	11	9	11	12	8	10	14	10	10	11	9	11	5	6	14	8	19	17	16	14	8	7
8	Belgium	6	4	6	7	19	21	20	21	5	13	11	9	15	11	21	14	13	11	12	12	9	8
9	Canada	23	23	16	17	11	15	10	8	7	7	6	6	13	28	10	11	10	19	13	10	10	9
10	India	13	12	5	9	11	13	19	18	11	12	16	10	5	18	7	9	30	24	24	17	11	10
11	Sweden	11	11	8	5	36	14	13	17	13	15	14	17	11	36	25	27	9	9	7	8	13	11
12	Italy	8	13	13	14	17	27	22	24	16	16	19	14	17	7	8	10	26	22	18	21	14	12
13	China	15	26	14	20	18	20	6	13	17	19	13	15	5	5	6	4	37	48	22	37	15	13
14	Scotland	24	19	23	22	19	23	18	15	14	17	15	16	17	33	18	26	13	13	15	13	16	14
15	Spain	17	25	18	15	23	24	27	27	19	21	23	20	22	8	22	12	26	15	19	19	17	15
16	Japan	24	20	19	16	19	34	15	20	18	32	17	23	26	14	11	7	24	39	17	28	18	16
17	Denmark	27	24	24	24	24	22	12	12	27	25	22	22	28	40	42	35	12	7	9	11	19	17
18	Brazil	21	34	30	25	15	29	33	33	23	20	25	19	19	15	13	16	35	25	30	25	20	18
19	Norway	10	10	9	11	49	52	31	44	36	50	36	38	41	56	42	38	20	16	11	16	23	19
20	Thailand	39	63	53	56	22	32	38	31	20	24	29	18	32	44	37	21	22	20	28	22	25	20

Do the collaborating countries contribute proportionately across the regional countries? The results presented in Tables 1 and 2 suggest that, save for a few cases, each country's share in Ethiopia's, Ghana's, Kenya's, Nigeria's and Tanzania's links, link strength, papers, and citation impact, varies. As a result, we conducted a Pearson correlation test to assess the performance of the countries or regions across the five sub-Saharan countries. The test yielded high and statistically significant coefficients ranging from r = 0.78, p = 0.001 to r = 0.97, p = 0.001 (see Table 4). In terms of the links, the highest coefficient (i.e. r = 0.91) was registered between Kenya and Nigeria, Kenya and Ghana and Ghana and Nigeria, while a coefficient value of r = 0.95 was obtained in the analysis of total link strength between Kenya and Ethiopia

The other relationships that produced high correlation coefficients above r = 0.90 as shown in Table 4 are (a) total link strength (Ethiopia vs. Ghana, r = 0.92; Ethiopia vs. Tanzania, r = 0.92; Ghana vs. Kenya, r = 0.94; Ghana vs. Nigeria, r = 0.92; Ghana vs. Tanzania, r = 0.92), (b) papers (Ethiopia vs. Kenya, r = 0.93; Ethiopia vs. Ghana, r = 0.93), (c) citations (all relationships, except Nigeria vs. Tanzania, yielded coefficients above r = 0.09), and (d) normalised citations (all relationships, except Nigeria vs. Tanzania, yielded coefficients above r = 0.09).

Table 6: Ranking regional country contributors to the selected countries' research performance

		Ethiopia				**Ghana**				**Kenya**				**Nigeria**				**Tanzania**				**Overall Ranking**	
No.	Coll Country	L	TL	P	C	L	TL	P	C	L	TL	P	C	L	TL	P	C	L	TL	P	C	World	Regi-onal
1	South Africa	7	5	7	6	5	3	3	4	3	3	3	3	3	3	2	3	5	5	4	5	3	1
2	Uganda	20	14	17	18	14	16	21	25	14	8	7	13	13	19	20	25	6	10	10	9	12	2
3	Cameroon	26	36	38	31	16	17	23	26	29	34	27	41	20	25	19	30	13	30	33	29	21	3
4	Malawi	43	35	36	34	37	26	28	22	32	18	24	21	24	45	47	58	24	18	21	20	22	4
5	Burkina Faso	31	29	39	43	26	12	16	16	44	29	35	42	32	35	36	54	36	23	32	30	24	5
6	Senegal	36	27	46	42	32	18	25	29	49	40	39	47	24	39	46	62	41	44	41	46	28	6
7	Mozambique	36	37	48	44	65	41	49	38	32	31	37	33	57	42	56	51	16	21	29	26	29	7
8	Zimbabwe	45	46	34	38	37	43	48	54	37	30	28	25	64	65	53	64	23	29	27	24	31	8
9	Zambia	43	56	55	52	40	45	44	56	23	23	26	36	43	52	51	61	34	31	25	27	32	9
10	Sudan	22	21	32	27	42	44	54	51	37	47	40	45	51	53	59	65	32	42	47	38	34	10
11	Mali	66	51	59	57	43	25	29	28	42	27	33	34	54	50	53	70	39	37	45	42	37	11
12	Egypt	29	43	35	36	33	40	37	45	53	69	47	57	27	46	31	43	48	75	62	63	39	12
13	Cote Ivoire	48	41	60	46	37	28	30	42	51	55	55	63	29	51	48	63	44	51	50	60	41	13
14	Benin	61	76	70	81	46	31	24	37	45	53	48	60	43	43	32	52	31	35	38	53	42	14
15	Dem Rep Congo	48	62	61	80	33	42	55	40	39	49	43	49	43	55	65	48	26	46	46	49	46	15
16	Rwanda	41	55	48	59	78	61	60	72	52	39	33	55	63	62	74	82	47	43	35	54	52	16
17	Botswana	57	54	31	62	61	65	67	106	54	45	50	32	62	74	53	74	68	55	44	43	57	17
18	Niger	85	59	62	75	65	39	41	60	73	78	64	83	48	47	33	67	62	53	64	66	58	18
19	Gabon	93	106	96	78	49	35	43	23	76	52	69	61	81	88	98	91	39	34	43	36	64	19
20	Gambia	55	42	67	49	55	30	35	30	54	26	45	39	43	63	65	68	125	137	150	162	66	20

Table 7: Countries' average contribution to and share of selected sub-Saharan African countries' research performance (Mean Score and Mean Percentage Share)

		Mean (x□)			Mean % share		
	Measurement Indicator	**Int.**	**Reg.**	**Tot.**	**Int.**	**Reg.**	**Tot.**
Ethiopia	L	35.75	50.02	39.56	23.12	32.21	25.36
	LS	876.18	894.92	885.20	0.89	0.89	0.88
	P	106.25	77.07	99.63	0.70	0.51	0.64
	C	1957.18	1451.89	1843.40	1.04	0.77	0.96
	NC	186.63	153.41	179.71	1.23	1.01	1.17
Ghana	L	45.46	65.43	50.81	27.22	38.74	30.06
	LS	316.78	559.06	380.93	0.41	0.72	0.49
	P	94.43	104.91	98.09	0.79	0.88	0.81
	C	2269.22	2450.70	2338.56	1.39	1.50	1.41
	NC	170.57	206.15	181.54	1.44	1.74	1.51
Kenya	L	59.31	81.25	65.06	31.62	43.20	34.42
	LS	3106.15	3568.94	3240.22	1.21	1.37	1.24
	P	221.63	203.39	218.87	0.99	0.91	0.97
	C	7510.43	5935.09	7168.76	1.58	1.25	1.49
	NC	407.98	331.80	391.90	1.82	1.48	1.72
Nigeria	L	47.63	69.75	53.49	26.10	38.00	29.07
	LS	1408.95	1261.68	1377.65	1.48	1.31	1.43
	P	156.05	154.94	157.27	0.43	0.43	0.43
	C	4506.72	2794.07	4101.15	1.23	0.76	1.10
	NC	471.27	333.99	439.82	1.32	0.94	1.21
Tanzania	L	37.58	63.66	44.48	22.12	37.19	25.86
	LS	1464.66	1613.00	1510.13	1.18	1.28	1.20
	P	115.07	108.13	114.35	1.00	0.94	0.98
	C	3459.01	3248.30	3437.31	1.49	1.39	1.45
	NC	192.44	208.46	198.51	1.60	1.74	1.63

In order to answer the question on which country, among the five selected for the study, benefits the most from its regional and international collaborators, Table 7 provides the collaborating countries' mean scores and mean percentage share of the five countries' research performance. The mean scores in columns 3-5 simply refer to the average score per country that collaborated with the five countries while the percentage share refers to collaborating countries' share (in percentage) of each of the five countries' (in column) links, link strength, papers, citations and normalized citations. For example, the average number of links of the countries that collaborated with Ethiopia from 2000 to 2019 (see row three from the top) is 35.75 (international [foreign] countries), 50.02 (other regional or African countries), and 39.56 (both categories of countries), while the same countries' percentage share of Ethiopia's total number of links is 23.12% (international), 32.21% (regional) and 25.36% (both categories of countries). In view of the aforementioned explanation of how to read Table 7, Kenya benefits the most from both the other African and international countries. For instance, the average contribution of all the countries in the case of Kenya is 65.06 links, 3240.22 total link strength, 218.8 papers, 7168.76 citations, 391.90 normalised citations. This pattern is replicated in the countries' percentage share across the five countries investigated in the study. Nigeria was the second-most beneficiary in all indicators except in the case of normalised citations where it overtook Kenya.

Conclusions and Recommendations

The academic ranking of universities, individual researchers and even countries, in recent times, is one of the factors that has heightened the interest in research collaboration, particularly because research collaboration increases productivity and improves citation impact. The need to have partnerships that yield maximum productivity and impact of research is therefore greater in the contemporary scientific community and research circles than before, despite the unethical behaviors that have been reported regarding passive collaboration. The current study, which sought to examine the extent of research collaboration in the selected countries, reveals that five sub-Saharan African countries that were the subject of investigation in the study, have witnessed wide collaboration networks [both regionally and internationally], increased co-authorship of papers and, as a result, increased citation impact. The international collaborators are dominated by the USA and England, which co-produce over 90% of each of the regional countries' papers. The international scientific community, however, does not contribute reciprocally on the number of links and link strength while their contribution in the number of citations and citation impact is relatively high when compared to the regional countries' share. The rest of Africa contributes more in terms of the average number of links and link strength than the international community, implying that all the regional countries have strong collaboration links with each other and with the rest of the five countries' collaborators. Regarding the regional country that has benefitted the most from international and regional collaboration, Kenya gained the most followed by Nigeria and Ghana, with the greatest benefit being in the form of papers and citation impact originating from the countries' partnerships with the international community.

Implications of the Study

In view of the current study's findings, one would ask: Should countries in Africa strategically engage in partnerships that benefit them the most? Which partnerships should be revitalized or strengthened in line with the UN's 17th SDG? Africa is already disadvantaged in terms of research resources such as funding, research facilities (e.g. laboratories and other scientific equipment), and capacity (i.e. number of researchers per national population size). In responding to the foregoing question, one is reminded of the old adage, *he who pays the piper calls the tune*. Do African countries have a say on which countries they can collaborate with in research, especially in situations where the proposed research is initiated and funded by foreign countries? Do African researchers care which country funds their research and therefore determines the trajectory of the funded research as long as they receive funding which is often hard to secure in the continent? We do not have answers to these questions, but as institutions and researchers in Africa ponder on the questions, among others, there is need to take note of the benefits that accrue from different partnerships; partnerships which, in our view, should be maintained and strengthened. The study has demonstrated that while collaborating with some countries yields high returns in terms of papers, collaboration links and citation impact, other partnerships lead to low returns. Nevertheless, while it is true that international collaboration increases productivity and impact, the current study has similarly revealed that regional collaboration benefits the African countries the most in terms of collaboration links and link strength, which may in turn increase productivity and impact. As such, there is need to nurture African regional collaborations as the countries pursue international collaboration. Finally, we believe that the realization of the targets in the UN's Goal 17 in sub-Saharan Africa, as they pertain to science and technology, depends on many factors, including strategically seeking for and contractually establishing mutually beneficial research partnerships in and for the region.

Further Research

This study used data from three citation indexes for the sciences, social science, and arts and humanities. It is possible that lumping the data for these research domains together might not have revealed the differences that may exist in the different research domains. There is therefore need for further research to consider the existence of differences in research collaboration as a result of disciplinary differences. Further research is also recommended to explore the collaboration patterns in the African countries that were not covered in this study.

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Knowledge and Skills Requirements of National University of Lesotho Librarians in Meeting Information Needs of Humanities Undergraduate Students in the Digital Age

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Abstract

Digital age has transformed higher education and this has affected the roles of academic libraries as well. The digital age, in the context of this study, refers to an era where information management services such as organisation, management, retrieval, and transfer of information are done primarily by using computers and other technology devices. In this era, contemporary technologies such as social media, the Internet and other technology tools have become the driving forces in the dissemination and communication of information (Schmidt and Cohen, 2013; Tella, Akande and Bamidele, 2018). Academic librarians are under pressure since they need to embrace and adapt to technological changes in order to meet users' needs. This study was conducted to ascertain the knowledge and skills requirements of librarians in the digital era academic library environment, in the context of Lesotho, using the case study of the National University of Lesotho (NUL). Convergent parallel mixed methods approach within a pragmativist paradigm and case study design informed the methodology. The target population included NUL librarians and humanities undergraduate students. Data were collected via face-to-face semi-structured interviews with librarians and a structured questionnaire for students. The study concludes that a blend of disciplinary, generic and personal competencies is required for librarians to meet the library related information needs in the current digital age.

Keywords: *Academic Libraries, Digital Era, Disciplinary Knowledge, Generic Skills, Personal Competencies*

Introduction

The library and information services (LIS) profession has been changing rapidly due to technological advancements, globalisation and digitisation of information. Technology has transformed higher education (Ogunsola, 2011) and this has affected the roles of academic libraries as well. In concurring, Tella, Akande and Bamidele (2018) emphasised that the growth of ICTs has 'revolutionised' almost every human activity in libraries and has impacted enormously in their operations and services (Rifaudeen, 2015). Academic librarians under pressure since they need to embrace and adapt to the LIS landscape in order to meet users' needs. According to Raju (2014) the 'dramatic' changes effected by technology in the traditional academic library have greatly impacted on the knowledge and skills of LIS professionals working in the digital environment. New demands have emerged, and hence a need for a highly skilled workforce and the adoption of skills and competencies to meet the dynamic needs of users (Gerolimos and Konsta, 2008; Smith, Hurd and Schmidt, 2013). In fact, because of the changing skills requirements, librarians, according to Mathews and Pardue (2009), are morphing to

information technology (IT) specialists. Tella, Akande and Bamidele (2018) in supporting Pardue stressed that ICT knowledge and skills is a requirement for recruitment of librarians. Technology has changed librarians' roles and influenced the way the services and collections of academic libraries are utilised, and hence the reinvention of more traditional posts and the creation of new job roles by academic libraries (Goetsch, 2008).

Several studies on the LIS job market, and LIS education and training have been conducted globally to identify the relevant knowledge and skills competencies required in digital academic libraries. Some have been conducted globally in countries such as Australia (Haddow, 2012), India (Sarasvathy, Nambratha and Giddaiah, 2012), Israel (Bronstein, 2015), Malaysia (Hashim and Mokhtar, 2012), Pakistan (Ansari, 2011), United Kingdom (Orme, 2008), and the United States of America (Blakiston, 2011; Nonthacumjane, 2011). Some of these studies have been done in the African continent and include studies in the African university libraries context by Chiware (2007), in Kenya (Kavulya, 2007), in Nigeria (Ezema, Ugwuanyi and Ugwu, 2014; Emiri, 2015; Madu, Aboyade and Ajayi, 2018), in South Africa (Fourie, 2004; Ocholla and Shongwe, 2013; Raju, 2014; Raju, 2016) and in Sudan (Magara, 2010). The findings of these studies reveal that personal skills, generic skills and discipline-specific knowledge are generally the three major categories of knowledge and skills requirements for the digital age academic library. Skills such as interpersonal, communication, adaptive, leadership, information technology and many others fall within these three broad categories. In addition, today's digital skills needed for librarians include but are not limited to "trendspotting and implementation, website management, creating online instruction materials, technology assessment, social media/web 2.0/ outreach, technology training for both staff and patrons, electronic resource management, it/ systems, digital initiatives, electronic resource and online reference" (Radniecki, 2013).

The findings of the above African context studies further indicate that education and training are critical for the acquisition of required knowledge and skills by LIS professionals. Therefore, LIS (Library and Information Science/Studies) schools should regularly review and revise curricula in order "to meet the challenges of the new knowledge and skill requirements of the digital age academic library" (Raju, 2014). Mathews and Pardue (2009) emphasise that curricula should prepare librarians to adapt to technology and embrace ICTS. Tella, Akande and Bamidele (2018) too, stressed that librarians should integrate technologies into library practices in order to render services satisfactory to the digital age library users. The literature indicates that LIS training is critical in addressing the challenges brought by technological changes in academic libraries. Evolving technologies have ushered changes in the traditional academic library environment and this has in turn created gaps in LIS professionals' skills sets. Hence the significance of training and up-skilling in order for academic libraries, such as that of the National University of Lesotho, to remain relevant in the digital age. Change is inevitable and should be adapted to rather than rejected.

Background to the study

The National University of Lesotho (NUL) is a higher institution of learning in Roma, Lesotho. Lesotho is an independent country located in southern Africa and completely landlocked by the Republic of South Africa. NUL was established in 1945. Currently the university comprises of seven faculties that offer both postgraduate and undergraduate programmes. The total number of students that enrolled for the academic year 2015/2016 was 9,544. There were 9,367 undergraduates and 177 postgraduates (National University of Lesotho, 2016). The Faculty of Humanities, which was the focus of this study, has eight academic departments with 55 academic staff and three non-academic staff, and a total student number of 1,016; that is, 998 undergraduates and 18 postgraduates, at the time of the study being conducted (National University of Lesotho, 2016). NUL has a library named the Thomas Mofolo Library, located on the main campus in Roma.

The NUL Library was established in 1954 as a college library. It became a 'fully-fledged' university library in 1964 when it was named after Thomas Mofolo (a Mosotho author, who wrote mostly in the Sesotho language). The NUL Library comprises of the main library; the law library; the Archives, Records Management, Museum and Documentation Division (AREMDOD), all located on the Roma campus; and, a branch library at the Institute of

Extra-Mural Studies (IEMS) in Maseru, which is the capital of Lesotho. This branch library provides services primarily to part-time students and lecturers (National University of Lesotho, 2016).

The library had only two qualified (professional) librarians at its beginning as a university library in 1954. It now has 39 staff members, including professional and support staff (National University of Lesotho, 2016). However, this may not be considered as a significant growth when seen in the context of the number of decades since its establishment (National University of Lesotho, 2006). According to the National University of Lesotho (2006) the quality of NUL Library services is not only located in the number of employees but also in the quality of individual staff members and most importantly, in their professional qualifications and personal qualities applied when executing their duties. Technological changes have no doubt impacted on the knowledge and skills requirements of academic librarians in this academic library as well. Hence, the importance of this study as it assisted in ascertaining the impact of such technological changes on the knowledge and skills competencies of NUL librarians.

Research Problem

The changing academic library landscape, driven largely by rapidly evolving information and communication technologies (ICTs), has led to librarians adapting to changes in order to meet users' needs. Rapidly evolving technologies have changed academic librarians' job descriptions as their roles and functions have also changed (Goetsch, 2008; Ogunsola, 2011; Madu, Aboyade and Ajayi (2018). However, Fourie (2004) and Rifaudeen (2015) cautioned that while librarians might be aware of their competency deficiencies in this fast changing digital information environment, they might be incapable of repositioning themselves in time for the service to meet users' needs.

At about the same time, Weech (2005) observed that, ''we do not know much about what skills are needed for professionals who work as digital librarians". This statement, although somewhat dated, is nevertheless still an indication that fast evolving technology makes it complex for LIS professionals to readily identify 'required' skills and competencies appropriate for the digital academic library environment. Itsekor and James (2012), more recently, undertook a study in Nigeria to ascertain the "digital literacy skills" of academic librarians and found that they lacked appropriate skills to use computers. The inadequacy of computer literacy skills pauses a challenge for them to provide, maintain and manage the influx of digital information resources. Itsekor and James (2012) also indicated that academic librarians in their study were "not encouraged to develop themselves", thus signalling another major challenge of change in organisations.

The digital academic library will always require a new type of a professional equipped with 'better' knowledge, skills and who is 'broadly educated' (Partridge et al., 2010). This becomes a problem in developing countries like Lesotho where most academic libraries are very under-staffed and majority of staff members are not qualified librarians (that is, they do not possess a professional LIS qualification). The researcher made this assertion based on personal experience as a Lesotho national with experience of NUL and its academic library by virtue of having used the library and interacted with its library staff.

The literature is clear that academic libraries all over the world are encountering challenges with regard to changes brought by rapidly evolving ICTs (Rifaudeen, 2015; Madu, Aboyade and Ajayi, 2018; Tella, Akande and Bamidele, 2018). The NUL Library would be no exception; the situation is aggravated by its developing African context. Therefore this study, using a humanities undergraduate context, sought to address the issue of the knowledge and skills requirements of NUL librarians in this technology-driven, rapidly evolving academic library landscape. The study also sought to address related issues of how NUL librarians were adapting to this changing environment, and the type of education and training needed for this environment. The type of training required could be acquired through formal, informal, in-service training and continuing education programmes, which encompass on-the-job and off-the job training; with formal education delivered via short courses, lectures and seminars, and informal training via workshops, conferences and through individuals such as colleagues (Blakiston, 2011; Ezema, Ugwuanyi and Ugwa, 2014; Emiri, 2015).

Objectives of the Study

The broad objective of this study was to ascertain what knowledge and skills are required for NUL librarians in order to meet the information needs of humanities undergraduate students in the digital era academic library environment. This study therefore sought to address the following research questions:

- What are the library related information needs of NUL humanities undergraduate students in the current digital age?
- What knowledge and skills are required of NUL librarians in meeting the library related information needs of humanities undergraduate students in the current digital age?
- To what extent has technology affected the roles and functions of NUL academic librarians?
- To what extent are NUL librarians readily adapting to and embracing technological changes affecting academic library resources and services?
- What type of education and training are required for NUL librarians to effectively meet the information needs of humanities undergraduate students in the digital age academic library environment?

Literature Review

The reviewed literature shows that some of the identified key concepts or themes on knowledge and skills requirements in the digital era academic library environment include discipline-specific knowledge, generic skills and personal competencies. The literature also reflects on the impact of evolving technology on LIS professionals' roles and functions and on how education and training in LIS and related fields could contribute to growing knowledge and skills to meet LIS workplace demands (Burnett, 2013). Organisational learning theory was found suitable in supporting this study to ascertain knowledge and skills requirements of NUL librarians in the digital age; and also in addressing the problem of evolving ICTs at the NUL Library, which required librarians to adapt to changes (and make evidence-based decisions) in order to meet users' needs.

The Academic Library in the Digital Era

ICTs have changed the traditional academic library immensely thus affecting the knowledge and skills requirements for librarians operating in the digital environment (Raju, 2014). In support, Patel (2012) too claims that technology has changed the nature of academic libraries and the roles they play. The impact of digital technology (Campbell, 2006) has brought about significant changes in the nomenclature roles, competencies and skills of digital librarians (Myburgh and Tammaro, 2013). Hence the need for academic libraries in the digital environment to embrace "digitisation, electronic publishing, Web 2.0, Web 3.0, Library 2.0, Library 3.0, social media, open access, and a host of other fast evolving ICTs" (Raju, 2014: 164).

Information Needs in Digital Academic Libraries

Information may also be required to formulate ideas or create new knowledge (Shenton and Dixon, 2004). Cooke (2012) opines that the expansion and change in librarianship with evolving technologies has led to the emergence of various patron groups with more intricate information needs. Therefore, librarians should adapt to evolving needs of users (Patel, 2012). Communication skills are critical since they enable academic librarians to articulate and probe information needs of users as they (librarians) tend to be reluctant in keeping in touch with patrons and end up not knowing them as they should (Nicholas and Herman, 2009). According to Bopape et. al. (2017) the needs of students in the digital era include reading space, access to internet, teaching, learning and research information. They further indicate that needs are often vague and complex and depend on the situations in which people find themselves. This study focused on knowledge and skills competencies required by academic librarians to assist undergraduate students to identify when there is a gap in their knowledge and to meet their information needs to fill this gap.

Knowledge and Skills Requirements in the Digital Academic Library

According to the Association of College and Research Libraries (ACRL) (2006), librarians operating in the digital environment must possess competencies that "comprise a different mix of skills". Studies by Orme (2008) in the United

Kingdom and Haddow (2012) in Australia found that a mixture of professional, generic and personal skills is a requirement for LIS professionals. In agreeing with the "mixture" of skills required, Choi and Rasmussen also found that "digital librarians must possess the necessary core knowledge and skills of a traditional profession as well as new technological knowledge and managerial skills" (2009). An exploratory study conducted by Raju (2014) in South Africa using content analysis of job advertisements and interviews, too revealed that a "blend of discipline-specific knowledge, generic skills and personal competences" are required for LIS professionals working in digital era academic libraries.

Discipline-Specific Knowledge

Discipline-specific knowledge, also referred to as professional knowledge (Raju, 2016), 'content knowledge' or 'subject matter expertise' (Partridge and Hallam, 2004) and often inclusive of discipline-specific skills, is defined as "knowledge which is learned in the LIS programmes in both undergraduate and postgraduate levels" (Nonthacumjane, 2011); and as a result an imperative for LIS employers (Raju, 2014). Metadata, content management, digital curation, digitisation and preservation, user needs and collection development have been identified by Raju (2016) as some of the essential discipline-specific knowledge for LIS professionals. According to Raju (2014) cataloguing and classification, which have existed since the inception of the discipline of library and information science, are competencies still required in digital libraries for knowledge organisation and retrieval. Choi and Rasmussen (2009) point out that core knowledge and skills of traditional librarianship are essential in the digital academic library environment but they must be supplemented by the new technological knowledge and managerial skills.

As a result of technological advancements, there are emerging trends such as digital curation, research data management and research librarianship, to mention but a few, that are challenging academic libraries in the digital era (Raju, 2014). As such, professional skills are required in academic libraries to develop tools, portals and customise strategies for precision research on the massive web (Campbell, 2006). Hence, discipline-specific knowledge becomes a necessity in academic libraries, especially in research-oriented areas. It would seem that regardless of the new technologies that societies use to access information, LIS professionals would always be required to contribute using their professional knowledge.

Generic Skills

According to Orme (2008) generic skills encompass personal, managerial, information technology and other profession related skills that allow people to work not only in disciplinary areas but also in other social situations (Raju, 2014). Generic skills are also referred to as life skills, for example, communication and interpersonal skills, critical thinking, problem solving and teamwork or "transferrable skills" or "graduate attributes" (Partridge and Hallam, 2004). Generic skills "complement the discipline specific skills and professional knowledge acquired by students through their university study" (Partridge and Hallam, 2004), and are hence required in the rapidly changing academic library environment. It is critical for the success of libraries in the digital age to employ LIS professionals who are "vibrant" and equipped with generic skills rather than just discipline-based skills (Missingham, 2006). General computing or computer literacy such as information literacy and technology skills are generic skills (Raju, 2014) required to provide information services expected by users in the digital academic library environment. LIS professionals in Africa, where this study was conducted, require generic skills to cope with the rapid changes in the digital era (Chiware, 2007). The literature suggests that although generic skills are very important in the digital information environment, they do not displace the professional skills that are still valued in the LIS workplace (Sreenivasulu, 2000; Partridge and Hallam, 2004; Missingham, 2006; Orme, 2008; Nonthacumjane, 2011). This means that as much as generic skills are highly required in the digital academic libraries, they are not the core disciplinary skills but they do augment professional skills (Riley-Huff and Rholes, 2011).

Personal Competencies

Personal skills are defined by Nonthacumjane (2011) as "appropriate attitudes, values and personal traits".

The literature reveals that librarians of the 21st Century require a wide range of skills inclusive of behavioural or personal competencies (Sreenivasulu, 2000; Shibanda, 2001; Missingham, 2006; Knight, 2009; Partridge et al., 2010; Nonthacumjane, 2011; Shongwe and Ocholla, 2012; Ezema, Ugwuanyi and Ugwu, 2014). Contemporary LIS professionals require personal skills such as creativity, flexibility, reflectibility, adaptability, detective-like, ability to deal with variety of users, responsive to peoples' needs, enthusiastic and self-motivated (Nonthacumjane, 2011).

The literature indicates that discipline-specific knowledge, generic skills and personal attributes are the core competencies required in the LIS profession. Hence a need for LIS professionals that are "multi-skilled" (Raju 2014). The NUL Library too needs to display this multi-skilled feature in order for its librarians to mediate a technology-driven and rapidly evolving higher education information landscape. While discipline-specific knowledge (and skills) seems relevant in the digital academic library, it must be supplemented with generic skills and personal competencies to meet the dynamic and complex needs of users in the fast changing academic library landscape. Thus, the three categories of knowledge/skills (disciplinary, generic and personal) have emerged in the literature as job requirements in a digital age academic library. They are needed, *inter alia*, to adapt to technological changes affecting academic libraries such as the NUL Library.

Methodology

The study adopted a pragmativist paradigm, allowing it to draw from both qualitative and quantitative philosophical assumptions (Creswell, 2014). A case study design was employed to investigate the problem which this study addressed. This study employed a "convergent parallel mixed method" approach (Creswell, 2014), using both quantitative and qualitative data collection methods. Data were collected via use of a structured questionnaire for probability random sampled students and face-to-face semi-structured interviews for purposively sampled NUL librarians in different positions within various departments and units of the library. Interviewees were selected based on the researcher's prior knowledge of the NUL librarians. Data were collected, at roughly the same time, and analysed separately, but then integrated in the interpretation of overall findings (Creswell, 2014). The target population of study comprised of NUL librarians and humanities undergraduate users of the NUL Library.

The total population of professional NUL librarians at the time of study was 35. Only 28 were available at the time of data collection (October 2016) as the rest (seven) were on study leave (NUL Library, personal communication 2016, July 27). From these 28 professional librarians, 13 were purposively selected for interviews: the Director of the NUL Library, three section managers and three librarians at operational level in each section. This selection (which was representative of all positions within the library) was based on the fact that case studies focus on intensive and in-depth "specific unit[s] of analysis", and hence they generally require a much smaller sample size because large samples can reduce their effectiveness (Yin, 2014). So 28 was quite a bigger number. Random sampling was employed to obtain quantitative data for the study. It was further narrowed down to stratified random sampling. In 2016 NUL had a total population of 998 humanities undergraduate students (National University of Lesotho, 2016). This study excluded 6,034 undergraduate students from other faculties and 177 postgraduate students, as the focus of this study was on NUL humanities undergraduate students because it was convenient for the researcher (as a humanities student) to conduct the study with this faculty.

The Survey System Software Web tool (Creative Research System 2012) was used to calculate the sample size and confidence interval for the population of NUL humanities undergraduate students: a sample of 278 was calculated from the population of 998 students, with a confidence level of 95% and sampling margin of error of 5%. The researcher used the sample size table developed by Research Advisors (2006) to verify the accuracy of the online calculator and it recommended the same figure. As a result, a sample of 278 humanities undergraduate students was chosen to participate in the study. The random sampling was further narrowed down to stratified random sampling to ensure that all strata among humanities undergraduate students were represented in the selected sample. The different strata included age, year of study, programme of study and department.

Data was collected for the period of a month (5 October to 28 October 2016). The entire data analysis process was done 'by hand' so that the researcher could develop a greater understanding of the data collected in order to 'make sense' of the data (Travis, 1999). The results were tabulated according to frequency distributions, using *Microsoft Excel*. Tables 1, 2 and 3 present the three categories of competencies: discipline-specific knowledge and skills, generic skills and personal attributes that emerged as the core competencies required by LIS professionals in the digital age academic library to meet users' evolving information needs with frequency counts from highest to lowest.

Findings and Discussion

On the question, "what are the library related information needs of NUL humanities undergraduate students in the current digital age?" the findings revealed that NUL humanities undergraduate students needed information mostly for completion of coursework assignments, practical's and projects and for preparation for tests and examinations among others. This finding was supported by findings from interviews with NUL librarians with a large number who indicated that assignments and projects were the main purposes for which students have a need for information from the NUL Library. The findings are presented in Table 1.

Table 1: Purposes for which humanities undergraduate students need information from the NUL Library

Library related information needs identified by students (N=202)	**Frequency**	**Percentage**
Coursework assignments, practical and projects	149	74%
Preparation for tests and examinations	140	69%
Course work reading requirements	100	50%
To learn how to locate information sources and resources using the library website	78	38%
Guidance on bibliographic referencing	77	38%
To learn how to use information database and other electronic information resources	69	34%
Tutorials, seminars and workshops	24	115
Librarians' views on library related information needs (N=13)		
Information for assignments	10	77%
Information for research projects	9	69%
For general reading/knowledge purposes	5	38%
Preparation for tests	3	23%
For leisure reasons	3	23%
For exam preparation	1	8%

To address the research question, "what knowledge and skills are required of NUL librarians in meeting the library related information needs of humanities undergraduate students in the current digital age?" the findings revealed relevant subject knowledge for information seeking purposes, plagiarism and how to avoid it and understanding information needs of library users as the top LIS disciplinary knowledge sets required of NUL librarians. The majority of librarian respondents identified information literacy training and above 50% identified information management and processing (for example, cataloguing, classification, abstracting, indexing) as the top most disciplinary knowledge sets required; showing the enduring importance and relevance of traditional LIS knowledge sets in the digital age (Mathews and Pardue, 2009). In terms of disciplinary skills, students surveyed indicated that information finding skills and the ability to use technology to deliver effective library services are critical LIS disciplinary skills, amongst other technology related disciplinary skills, required of NUL librarians.

Findings further revealed that the ability to teach students to do online searching, reference management software skills and information retrieval skills (print and electronic) were at the top of the list of disciplinary skills required of NUL librarians mentioned by interviewees. In comparing disciplinary knowledge and skills identified by student respondents to the ones identified by interviewed librarians, based on the high frequency scores, it would seem that librarians' knowledge of information literacy training and ability to teach students to do online searching could have influenced the high frequencies in the disciplinary knowledge and skills requirements identified by student respondents. There seemed to be some correlation with important disciplinary knowledge and skills sets between the views of surveyed students and interviewed librarians. Tables 2, 3, 4 and 5 present the findings.

Table 2: LIS disciplinary knowledge requirements identified by student respondents (N=202)

Disciplinary knowledge requirements	Frequency	Percentage
Relevant subject knowledge for information searching purposes (e.g. theology)	113	56%
Plagiarism and how to avoid it	105	52%
Understanding information needs of library users	103	51%
To learn how to locate information sources and resources using the library website	78	38%
Knowledge of new technologies for information access and communication (e.g. tablets)	94	47%
Relevant Library and Information Science (LIS) qualification	76	38%
Library rules and procedures	70	35%
Knowledge of information databases (general or subject specific)	67	33%
Reference management software (e.g. Refworks)	55	27%
Other	2	1%

Table 3: LIS disciplinary knowledge requirements identified by librarian respondents (N=13)

Disciplinary/professional knowledge	Frequency	Percentage
Information literacy training (library orientation, user education, instruction, etc.)	11	85%
Information management and processing (e.g. cataloguing, classification, abstracting, indexing)	10	77%
Knowledge of electronic journals	6	46%
Knowledge of online databases	5	38%
Knowledge of the acquisition process	4	31%
User studies (knowledge of users and their information needs)	4	31%
Knowledge management (e.g. creation, storage, sharing)	3	23%
Relevant subject knowledge (e.g. education, law, computer science)	3	23%
Records and archives management (e.g. creation, collection, storage, retention, retrieval, appraisal, disposal)	3	23%
Digital curation and preservation	3	23%
Knowledge of library automation	2	15%
Knowledge of citation and plagiarism	2	15%
Collection development (print and electronic)	1	2%
Knowledge of database management systems	1	8%
Knowledge of organising and processing online materials	1	8%
Understanding copyright laws and licensing	1	8%
Information repackaging (selective dissemination of information)	1	8%
Knowledge of reference management software	1	8%
Knowledge of library policy (rules and regulations)	1	8%
Library operations (knowledge of each section's functions and responsibilities)	1	8%
Knowledge of publishing	1	8%

Table 4: LIS disciplinary skills requirements identified by librarian respondents (N=13)

Disciplinary/professional Skills	Frequency	Percentage
Ability to teach students to do online searching	7	54%
Reference management software skills	7	54%
Information retrieval skills (print and electronic)	6	46%
Competency in using the library information management system to acquire, process and manage electronic resources	4	31%
Referral skills (attend to queries and refer where necessary without wasting users' time)	2	15%
Skills to catalogue manually	1	8%
Ability to evaluate e-resources	1	8%
Familiarity with the physical collection and its arrangement	1	8%

Table 5: LIS disciplinary skills requirements identified by student respondents (N=202)

Disciplinary skills requirements	Frequency	Percentage
Information finding skills (online and print sources)	141	70%
Ability to use technology in various forms to deliver effective library services,	137	68%
Ability to search electronic information databases and journals	116	57%
Internet searching skills	99	49%
Bibliographic referencing skills (e.g. using Refworks)	92	46%
Other	2	1%

The findings also revealed that communication skills emerged as the most required generic skills set for NUL librarians among both surveyed students and interviewed librarians. NUL librarians interviewed emphasised that communication was 'key' in an academic library environment, and that without it there was "no way" librarians would meet the ever changing students' information needs. The findings corroborate studies by Gerolimos and Konsta (2008); Orme (2008); Partridge, Lee and Munro (2010); Nonthacumjane (2011) which repeatedly reflected communication skills as a commonly sought generic skill among librarians (Orme 2008). Librarian and student respondents alike placed general computer literacy as the second most required generic skills set for NUL librarians at 64% (131 out of 204 students) and around slightly above 75% for librarians, respectively. Other generic skills identified by librarians and students as being critical for LIS professionals include Listening skills and Interpersonal skills. Online teaching skills, Customer service, Marketing skills, Management skills, teaching [and training] skills, Social media skills also notched up noteworthy frequency counts.

Table 6: Generic skills for librarians identified by student respondents (N=204)

Generic Skills	Frequency	Percentage
Communication skills	134	66%
General computer literacy	131	64%
Online teaching skills	92	45%
Customer service	90	44%
Teaching and training skills	82	40%
Listening skills	81	40%
Interpersonal skills	74	36%
Referral skills	63	31%
Learner focus	62	30%
Social media skills	51	26%
Other	2	1%

Table 7: Generic skills identified by librarian respondents (N=13)

Generic skills	Frequency	Percentage
Communication skills (oral and written)	11	85%
Computer literacy	10	77%
Listening skills	9	69%
Interpersonal skills	7	54%
Marketing skills	6	46%
Management skills	5	38%
Teaching skills (ability to train students)	5	38%
Social media skills	5	38%
Leadership skills	4	31%
Customer care skills	4	31%
Public relations skills	4	31%
Professional ethics	3	23%
Interpersonal relations	2	15%
Problem solving skills	2	15%
Basic research skills	2	15%
Collaborative skills	1	8%
Teamwork skills	1	8%
Presentation skills	1	8%
Counselling	1	8%
Safety skills (ability to use first aid kit, fire extinguishers, etc.)	1	8%

Furthermore, the findings revealed that having good general knowledge (141) out of 205 or 69%), as the outstanding personal attribute identified for their librarians by student respondents. It would seem that students need librarians equipped with a broad base of knowledge and 'ever ready' to attend to all their queries, including general ones and not only library related queries. Librarians interviewed, however, placed being friendly and welcoming at the top of their list of required personal traits. Student and librarian respondents also identified behavioural traits such as patience, reliable, responsive to others' needs and being flexible for contemporary LIS professionals practising in the digital age academic library. In Haddow's (2012) study, adaptability was identified as one of the crucial personal attributes required for LIS professionals in the digital age academic library environment. It was disappointing to note that none of the librarian respondents brought up adaptability as a required personal attribute despite the emphasis by organisational learning theory that adaptability is critical and relevant in a changing environment (Marquardt, 1996).

Table 8: Personal attributes for librarians identified by student respondents (N=205)

Personal attributes	Frequency	Percentage
Good general knowledge	141	69%
Patience	126	62%
Reliable	116	57%
Responsive to others' needs	113	55%
Flexible	112	56%
Passion for technology	94	46%
Interpersonal skills	74	36%
Dedicated	82	40%
Empathetic	47	23%
Other	9	4%

Table 9: Personal attributes identified by librarian respondents (N=13)

Personal attributes	Frequency	Percentage
Friendly and welcoming	8	62%
Humble	5	38%
Enthusiastic (show interest and willingness to assist)	5	38%
Caring about the needs of others	4	15%
Patience	3	23%
Polite	3	23%
Respectful	3	23%
Confidence	2	15%
Calm	2	15%
Creative	1	8%
Proactive	1	8%
Flexible	1	8%
Ethical	1	8%

With regard to research question "to what extent has technology affected the roles and functions of NUL academic librarians?" the findings revealed that a significant 53% of student respondents indicated both online information databases and the computerised catalogue as the most recognised new technology introduced into the services of the NUL Library. It was very evident from the findings that rapidly evolving ICTs have affected the roles and functions of NUL librarians. Interviewed librarians confirmed that NUL Library has incorporated technology into its service and resource offerings. All interviewed librarians were emphatic that technology has affected their roles and functions but both in positive and negative ways. One librarian respondent stated that although technology had brought "much confusion" in libraries, it is important and required in the digital age academic library to meet the information needs of students. Student respondents concurred with librarian respondents on the positive impact of technology on the roles and functions of librarians. It seemed that technology has significantly affected the roles and functions of NUL academic librarians, as perceived by both students and librarian respondents, whether positively or negatively.

Table 10: Impact of technology on the roles and functions of librarians as identified by student respondents (N=187)

Impact of technology	Frequency	Percentage
Online information databases	99	53%
Computerized catalogue	99	53%
Electronic journals	75	40%
Online user education	59	32%
Online reference services	46	25%
Reference management tools	24	13%
Social media notifications	20	11%
Other	1	1%

Table 11: Impact of technology on the roles and functions of librarians as identified by librarian respondents (N=13)

Impact of technology on roles and functions of librarians (responses)	Frequency	Percentage
Library automation – move from card catalogues to online public access catalogue (OPAC)	8	62%
Technology has made it easy to execute daily functions such as issuing, returning, searching and locating information sources	8	62%
Librarians need to acquire more training on ICTs to be functional in the digital era	5	38%
Improved library operations. Services are faster, more accurate and efficient (e.g. cataloguing, online acquisition, etc.)	4	31%
Librarians have become teachers because they are now required to train and demonstrate to the users (e.g. undergraduate students) how to access information sources and resources using new technology	3	23%
Evolving technology has forced the library to digitize and preserve archive materials and special documents so that they are available in digital format for easy access and for posterity	2	15%
Technology has led to the establishment of an institutional repository to publish and preserve NUL's intellectual output	1	8%
NUL librarians are required to acquire ongoing technological training to adapt to changes but some decided to retire because they found it hard to change from traditional systems.	1	8%
Librarians liaise with faculties and inform them of any changes in the library resulting from evolving technology so that faculties understand what is happening in the library	1	8%
There is much confusion brought by technology even though it is important and required	1	8%
Services such as current awareness have improved because of digital communication as they are now reach a wider audience.	1	8%
Technology has divided students and librarians because students prefer to use their own devices rather than come into the library	1	8%
Because of rapid changes brought about by technology, some librarians are left behind as it is difficult to cope with the pace at which technology changes	1	8%
Technology has made staff redundant and idle because it has lessened their workload	1	8%
Librarians cannot completely adapt to the new environment because they have to combine both traditional and digital methods to provide services	1	8%

On the question, "to what extent are NUL librarians readily adapting to and embracing technological changes affecting academic library resources and services?" findings revealed that the majority of students were uncertain as to whether NUL librarians were readily embracing technological change in the delivery of resources and services to humanities undergraduate students. It was encouraging that many of the librarians interviewed (8 out of 13) highlighted willingness of staff to attend training on evolving technology, an indication of the readiness to embrace change. This readiness was reinforced by the following comment by an interviewed librarian: "There is no way they [NUL librarians] cannot accept technology because nowadays everything is electronic. They are adapting to the digital era". At the same time, there were some uncertainties among NUL librarians as four of 13 librarians presented mixed views and one in the negative on this issue of adapting to technological changes. One interviewee indicated that "it is hard to say whether they [NUL librarians] are accepting or resisting because technology is there and they have no option but to catch up with the changes". Another interviewee revealed that "some decided to retire from work because of technological changes and the fear of the unknown". In other words, they were not able to adapt to the technological changes. This mixture of responses from the librarians on whether NUL librarians are embracing and adapting to technological changes could explain the uncertain perception among the students – yet a further indication of more work that needs to be done by the NUL Library to readily embrace change in order to overcome the challenges of a rapidly changing environment (Marquardt, 1996). Findings are reflected in table 12.

Table 12: Librarian respondents' views on NUL librarians adapting to technological changes (N=13)

Response	Explanations for response	Frequency	Percentage
Yes	Willingness of staff to attend training on evolving technology	8	62%
	When the system is down, staff do not provide services using the manual system but rather wait until the problem is resolved	7	54%
	When students enquire about information, librarians do not only tell them about print materials but also show them how to use e-resources (e.g. exam papers available in digital format)	6	46%
	Librarians use computers to do most duties (e.g. catalogue, classify, order, locate, issue, returns)	6	46%
	The library engages IT specialists whenever the system fails or shuts down. There are IT specialists on standby to assist with technological problems	4	31%
	Librarians train students to become part of the digital change taking place in the library	3	23%
	The library has recently upgraded its information management system and purchased a technologically advanced system to meet users' needs	2	15%
	Digitization of archives section of the library	2	15%
	Advertisements and announcements of library services are done through online collaborative and learning environment that supports the academic community in teaching, learning and research	2	15%
	Implementation of Wi-Fi network in the library as a way of encouraging students to frequently come to the library for online services and queries.	1	8%
	Opening of two Internet cafès inside the library (one uses cable network and the other is a 24 hours service that uses only Wi-Fi)	1	8%
	"There is no way they [NUL librarians] cannot accept technology because nowadays everything is electronic. They are adapting to the digital era."	1	8%
Partly yes partly no	"They [NUL librarians] seem ready to move with changes but there are those who are resisting because they feel technology is side-lining them."	1	8%
	"They [NUL librarians] are accepting it but there are those who don't seem keen to learn more about these changes."	1	8%
	"It is hard to say whether they [NUL librarians] are accepting or resisting because technology is there and they have no option but to catch up with the changes."	1	8%
	"They [NUL librarians] might be resisting, not because they do not want technology but because of the way it is introduced to them. The approach is not good."	1	8%
No	"Some decided to retire from work because of technological changes and the fear of the unknown."	1	8%

The findings also revealed the lack of or insufficient training, coping with rapid changes, shortage of staff and insufficient modern equipment as some of the challenges of embracing technology at NUL Library. Buarki, Hepworth and Murray (2011), identified coping with change as one of the major challenges facing the LIS profession. One librarian cogently remarked that "as long as technology exists in libraries, there will always be challenges whether we are readily embracing it or not".

Table 13: Librarian respondents' views on challenges the NUL Library and librarians a Facing (N=13)

Challenges	Frequency	Percentage
Lack of/insufficient training	11	85%
Coping with rapid changes such as changing from old to new library system (incompatibility of the systems)	8	62%
Shortage of staff that leads to inefficiency in service provision	7	54%
Insufficient equipment (shortage of modern equipment)	6	46%
Shortage of skills to comprehensively operate in the digital environment (e.g. digitization, copyright and licensing issues digital preservation)	4	31%
Lack of infrastructure (e.g. narrow bandwidth, power failure)	3	23%
NUL Library is lagging behind rapid changes as compared to its counterparts in Africa and globally	2	15%
Traditional training acquired many years ago	1	8%
Resistance to change as a result of, for example, age	1	8%
Funding challenges (financial constraints, little subvention from government)	1	8%
Lack of benchmarking to identify the library's shortcomings and to efficiently make the necessary changes	1	8%

With regard to the research question "what type of education and training are required for NUL librarians to effectively meet the information needs of humanities undergraduate students in the digital age academic library environment?" findings revealed that relevant LIS qualifications and IT related qualifications and a combination of these two at postgraduate and undergraduate levels were the preferred type of education and training required for NUL librarians to meet the humanities undergraduate students' library related information needs, according to students and librarians surveyed. This affirms that LIS education is an essential and a valuable starting point for LIS professionals to acquire knowledge and skills required in the LIS job market (Riley-Huff and Rholes, 2011). Ten out of 13 librarians highlighted basic ICTs, computer skills and evolving technologies (hands-on) as the top most informal training required of NUL librarians. Obviously, competency in ICTs and evolving technologies is what librarians need to meet students' technological needs as students also indicated IT related qualification as the second most required qualification for librarians in a digital academic library environment.

Table 14: Student respondents' views on NUL librarians' qualifications

Education and training required		Frequency	Percentage
Student respondents' views on NUL librarians' qualifications (N=201)			
Relevant LIS qualification		143	71%
IT related qualification		118	59%
Relevant subject degree		81	40%
Other		3	1%
Student respondent's combination for NUL librarians' qualifications (N=79)			
Relevant LIS qualification, IT related qualification		39	49%
Relevant LIS qualification, Relevant subject degree and IT related qualification		24	30%
Relevant LIS qualification, Relevant subject degree		11	14%
Relevant subject degree, IT related qualification		5	6%
Librarian respondents on education and training for NUL librarians (N=13)			
Formal education and training	Degree in LIS	6	46%
	Master's in LIS	5	38%
	Diploma in LIS	2	15%
	Subject degree (lower degree)	4	31%
Informal training (ongoing)	Basic ICTs, computer skills and evolving technologies (hands-on)	10	62%
	Marketing (online platforms)	5	15%
	Teaching (online and contact)	4	15%
	Customer care	3	23%
	Training of trainers	1	18%

With regard to level of education NUL librarians should possess, results showed that an overwhelming 158 out of 201 of the students surveyed indicated a postgraduate level, signalling that they expected a high level of knowledge and expertise on the part of their librarians. On the same question, librarian respondents mentioned master's degree (postgraduate) and bachelor's degree and diploma (undergraduate) as the type of education and training required of them by their students. A significant 40% of the students surveyed also considered a relevant subject degree as important. Studies by Gerolimos and Konsta (2008), Han and Hswe (2010) and Ocholla and Shongwe (2013) affirm that the LIS job market globally requires both undergraduate (for example, Diploma, Bachelor Degree) and postgraduate (for example, Honours, Masters, PhD.) qualifications. The findings further revealed that both formal and informal training are required for NUL librarians to adapt to changes. The librarian respondents preferred if informal training could be done via workshops, seminars, conferences and, most importantly, hands-on training to acquire practical skills.

Table 15: Student respondents' views on level of education for NUL librarians (N=201)

Impact of technology	Frequency	Percentage
Postgraduate	158	79%
Undergraduate	54	27%
Both	11	5%
Other	1	1%

Conclusion and Recommendation

Conclusions were drawn based on the discussion of the main findings in response to the research questions generated to address the study's objective. Coursework assignments, practical and projects and preparation for tests and examinations were the dominant purposes, amongst others, for which humanities undergraduate students needed information from the NUL Library. Findings revealed that students' library related information needs were met to a certain extent only. Therefore, NUL librarians need to further develop their knowledge and skills by engaging in effective learning since the library related information needs of students have been dramatically affected by evolving technology. Furthermore, a blend of competencies (disciplinary, generic and personal) is required for NUL librarians to meet the library related information needs of humanities undergraduate students in the current digital age.

While there seemed to be some correlation between NUL librarians and students surveyed especially on the disciplinary knowledge and skills required by NUL librarians, there was also some disjuncture between students' and librarians' perceptions of disciplinary knowledge and skills required to meet students' library related information needs. Hence, the need for the application of organisational learning by NUL Library to understand the perceptions of students to address this disjuncture.

Technology had a significant impact on the roles and functions of NUL librarians. Relevant LIS qualifications and IT related qualifications and a combination of the two at both postgraduate and undergraduate levels appeared to be the type of education and training required of NUL librarians to meet humanities undergraduate students' library related information needs. A relevant subject degree as well as informal education and training were also considered important. Based on the discussion and conclusions, the study recommended: Continuous education and training of NUL librarians (both formal and informal) towards effective learning so that they may more fully meet the library related information needs of humanities undergraduate students.

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