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Librarians' Awareness of Social Media Usage for Informal Scientific Communication in University Libraries in South-south, Nigeria

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LIBRARIANS' AWARENESS OF SOCIAL MEDIA USAGE FOR INFORMAL SCIENTIFIC COMMUNICATION IN UNIVERSITY LIBRARIES IN SOUTH-SOUTH, NIGERIA

BY

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Abstract

This study investigated librarians' awareness of social media usage for informal scientific communication in university libraries in South-South, Nigeria. The study helps to examine the extent of librarians' awareness of social media as well as the various social media tools available to librarians. The descriptive survey method was used for the study. The population of this study was 284 librarians in university libraries in South-south Nigeria. The researcher adopted the entire 284 population as the sample size for this study using the complete enumerative sampling technique. Questionnaire was used as the instrument for data collection and 284 copies of questionnaire were administered for this study. In response, 202 copies were retrieved and found useable, thereby indicating a response rate of 71%. The data was analysed using frequencies, percentages, statistical mean and Pearson Product Moment Correlation Coefficient r . The study contributed significantly to knowledge as it has been able to establish that a significant relationship exist between librarians' awareness of social media usage and informal scientific communication. The findings indicated that study revealed that librarians in university libraries in South-South Nigeria use that Facebook, Whatsapp, Google+, twitter and YouTube for informal scientific communication. The study also revealed that librarians are aware of social media usage for informal scientific communication, although the extent of awareness is low. The study recommended that University Librarians and other library administrator should sensitize library staff on the use of different social media tools for informal scientific communication because the world is now a global village. The study also recommended that Library associations should encourage the creation of invincible colleges using different social media tools such as Facebook, whatsapp, and blogs as this will promote the use of social media for informal scientific communication among librarians. The study concluded that for there to be an improved informal scientific communication among librarians (especially those in University libraries in South-south), there is need for librarians to be aware and fully adopt social media and other emerging technologies.

Keywords: Social Media Awareness, Librarians' awareness of Social Media, social media usage, Informal Scientific Communication, University libraries in Nigeria, South-South Nigeria, Scholarly Communication, Librarians' Use of Social Media.

INTRODUCTION

Librarians and other professionals communicate to brainstorm ideas, to formulate research problems, solve experimental or theoretical problems, disseminate results, and get feedback. The peer-reviewed journal article – polished, archived, and findable – is only one facet of the scholarly communication process. Science is inherently social and informal scientific communication forms the backbone that connects librarians and other professionals as well as enables scientific progress (King, 2003).

The term communication refers to the exchange of thoughts, messages, or information by speech, signals, writing, or behavior (Dapo, 2011). It is also referred to as the act of conveying intended meaning from one entity or group to another through the use of mutually understood signs and semantic rules (Popoola, 2014). The concept of communication has some basic steps which includes the forming of communicative intent, message composition, message encoding, transmission of signal using a specific channel or medium, reception of signal, message decoding and finally interpretation of the message by the recipient. Communication could be verbal or non-verbal and it could be through formal or informal means. According to Mukherji (2009), “communication among librarians or other professionals could be in a form of a formal scientific communication process or informal scientific communication” (p.4).

Also, Pikas (2009) noted that informal scientific communication is the interactive exchange of information between professionals in order to establish or maintain relationships, exchange information, or work collaboratively. The channel, message features, and social network influence the formulation, transmission, receipt, and understanding of messages; and also influences the selection of communication partners; and timing of the communication. Pikas (2009) defined informal scientific communication as a scholarly communication that does not involve published material that has been reviewed by peers, edited by publishers, and is retrievable through various information systems. Talja (2013) noted that Informal scientific communication refers to a communication between people (scholars) in a non-formal setting or through a non-formal means such as face-to-face discussion, exchange of personal communication, sharing views and opinions. Informal scientific communication is sometimes used to describe the informal communication network of people with like minds and similar interest. The channels established are fast and easy, while formal communication on the other

hand uses public and permanent vehicles such as books, journals and monographs to transmit information (Raini, 2010).

Furthermore, Borgman (2010) explained that informal scientific communication can take place anytime, anywhere and in any format. Traditionally, communication in the workplace between librarians who are co-located or who meet at local or national meetings is seen as an informal scientific communication. Additionally, reviewer notes, letters, telephone calls, and pre- and post-prints are seen as channels of informal scientific communication. Besides communicating to get advice, learn about new methods or theories, or hear about new results, librarians communicate informally to collaborate on research, co-author formal publications, and also to gossip and be creative (Allen, 2013).

However, Barjak (2008) found that informal scientific communication by its nature is fortuitous and that there is no certainty that partners will share correct, complete, and the highest quality information available. Ideas diffuse more quickly via informal scientific communication than through journal articles alone as they have champions who can provide subjective details on the innovation (Oyekan, 2007). Hew (2011) opined that informal communication is more effective at providing richness and context to the data and is used to transfer tacit knowledge (know-how) while formal communication transfers facts and descriptions (know-what). Perhaps more importantly, informal scientific communication unlike formal scientific communication is generally interactive and supports the exploration of new ideas with rapid feedback from a specialized audience who can uniquely address the question and who have pre-established common ground (Reid, 2007). Reid (2007) further stated that:

Information flowing through the informal domain is commonly abstracted, usually colloquial, frequently incomplete, and often vague. The communicator here is not seeking to report a finished scientific work. He often knows, in fact, that the person with whom he is communicating needs only a minimal communication of an idea to understand fully its meaning and importance for their common subject of research. The recipient embodies integrated knowledge; therefore, the message need not, in itself, be integrated (p.135).

Also, Ahmed (2015) explained that informal scientific communication is the communication between scholars in a non-formal setting through which they create new knowledge, and by which they measure its worth with colleagues prior to making a formal article available to the broader community. Traditionally, informal scientific communication is carried out in face-to-face meetings, in letters, and in pre-prints. Crawford (2011) surveyed two

thousand scientists and found that the most likely source of communication in research information was face-to-face contact. Reid (2007) noted that library associations organize lectures, seminars, colloquia, and other informal intellectual social gatherings to encourage information transfer. Crawford (2011) suggested that information transfer and identity alteration happen in these informal intellectual discussions via questioning from participants. Librarians establish intellectual identity through explaining and defending research results in scheduled presentations and informal hallway conversations. National professional society meetings provide forums for librarians to meet and establish contact with other scientists who remain geographically dispersed during the rest of the year. Librarians use information gained from these interactions to broaden or redirect current research, learn new techniques to incorporate, or alter the conceptual or theoretical orientation of their work (Reid, 2007).

Furthermore, Hew (2011) asserted that “in the past 20 years, new forms of informal scientific communication channels have emerged to stand side by side with traditional channels” (p.11). Digital repositories and open-access publishing were thought of as new forms of formal scientific scholarly publishing, whereas social media tools such as blogs, wikis, social academic networks, preprint repositories and other social media were considered to be informal communication channel (Allen, 2013). The emergence of new media (internet or digital technologies) changes the way people communicate with each other, access and share information. Unlike in the olden days where people only have to rely on traditional media for interpersonal communication; people now have the opportunity to seek, read, view, and share the information they like, anywhere, anytime, and on any topic. In this manner, the power and effect of social media as a channel of communication among librarians are increasing. This development has also led to the proliferation of new channels of informal scientific communication which include: bulletin board, forums, social networking sites, and many popular and non-popular search engines (McQuail, 2011).

Interestingly, Sajithra and Patil (2013) asserted that “modern technologies have increased the number of informal scientific communication channels used among librarians in communication” (p.6). These channels includes blogs, facebook, whatsapp, micro blogging sites, wikis and other social media sites which are increasingly being used by library and information science professionals for disseminating information and interaction with peers. Parveen (2011) observed that in addition to traditional informal scientific communication channels such as

letters, face-to-face communication; new and advanced method of informal scientific communication channels have emerged with the existence of internet sub-technologies such as social media. Sajithra and Patil (2013) noted that Blogs were among the first modern social media tools adopted by scholars for informal scientific communication. In addition, Reid (2007) opined that there are a number of dedicated scholarly blogging platforms for librarians which enable them to not only discuss current research, emerging initiatives, and scientific news, but also post personal stories about librarians starting to work in the field, or provide tips for new researchers. By connecting with new scholars in library and information science profession, these blogs and other social media sites are successful in forming a community of scholars, which in turn inspires further collaboration and connections between peers (Bonetta, 2007).

According to Raini (2010), “informal scientific communication which is usually transmitted through oral channels such as conferences, seminars, lectures and personal interviews, are now being widely done with the use of modern technologies” (p.12). Informal scientific communication channels are often rapid and effective for conveying information. They allow a high degree of flexibility and are easy and pleasant to use. There is the possibility of a two-way communication between the producer and the receiver of the information. Additionally, Bullas (2014) observed that one major channel of informal scientific communication among librarians all over the world is the use of social media tools such as twitter, facebook, LinkedIn and whatsapp. According to Bullas (2014), “social media is an online tools that allow interaction among individuals. Examples include professional networks such as ASHP Connect, career-building networks such as LinkedIn, and sites such as Facebook and Twitter that are primarily social but which may serve multiple purposes”(p.2). These various social media tools enhance communication among librarians and enable them to share ideas on the latest happenings in the library world. In addition, many of the prior studies on why librarians use online social media and networking tools often cite their need to communicate with each other. Marouf (2007) observed that many librarians confirmed two unintended benefit of using social media tools; the ability to spark and expand new ideas just from the direct interaction between the (micro) blogger and his/her readers and even occasionally replaces the scholar’s need to publish in traditional paper publications, such as scholarly journals. He further noted that “the use social media for informal scientific communication among librarians help to create and maintain a community or network of librarians.

Furthermore, Howard (2011) explained that Informational sites regarding professional information that allow for commentary from users and professionals should also be considered collaborative social media. According to Ellison (2007) “social media are web-based services that allow individuals to construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system” (p.3). Librarians now engage in informal scientific communication using different social media tools. Social media have transformed the way librarians and other professional groups communicate by reducing barriers to the exchange of information, increasing both the amount of communication and the number of people who can participate. Organizations like libraries, library association and information centre now use social media for both communication and marketing. Consequently, librarians in developed countries have adapted to advancing technology and are using social media to communicate within themselves and with the public (Bullas, 2014).

In recent years, there has been a shift in the channel of informal scientific communication among librarians as a new paradigm has revolutionized informal communication channels: social media, now an extremely popular communication tool and the most common activity carried out via the Internet for most individuals worldwide. Informal scientific communication done through social media, facilitate the procedures of accessing, communicating, and sharing information, knowledge, and resources with others (Algarni, 2014). Sheehan and Hoy (2009) observed that Informal scientific communication channels between librarians have existed for a long time, but have become increasingly important as improvements in information technology have made these communication channels easier to access and operate.

Several factors have been identified as the ones that can affect the informal scientific communication among librarians in this technologically advanced era. Awareness of social media usage for informal scientific communication is a primary factor that may affect the usage of social media for informal scientific communication (Hellou & Rahim, 2011).

Awareness of social media is a pre-requisite to subsequent usage of social media. Awareness simply refers to “knowing and understanding a lot about something that is happening in the world or around someone” (Mukherji, 2009, p.9). Oyekan (2007) identified lack of awareness as one of the issues which adversely militate against the use of the different social media in Nigeria. He explained that lack of awareness of the use of social media tools for

informal scientific communication among librarians is high in the country's academic and research institutions. Ellison (2007) further noted that more than 74% of the respondents surveyed during the course of his research, are completely unfamiliar with new social media tools. This implies that knowledge of social media is very low among librarians in the developing region like Nigeria. Omolayole (2008) noted that many librarians in Africa are not aware of the use of social media tools for informal scientific communication; hence, there is actually a communication gap between Librarians in Africa. There is a poor level of informal scientific communication among library practitioners in Nigeria because most of the library staff are either not aware of the use of social media for informal scientific communication or are not skilled in the use of the various social media tools. This further corroborates Hew (2011) assertion that "the level of social media awareness by librarians is a major determinant of its use for informal scientific communication. It is only when awareness is tackled in an empirical study that usage may be enhanced" (p.14). It is against this background that the researcher sought to investigate librarians' awareness of social media usage for informal scientific communication in university libraries in South-south, Nigeria.

STATEMENT OF THE PROBLEM

As different professions in Nigeria are changing and using different and modern channels of informal scientific communication to meet the challenges of the new millennium, librarians in university libraries who provide library and information resources and services to users are not left out. There is an ever and rapidly changing environment of informal scientific communication among librarians due to the advent and influence of ICT on communication. The emergence of internet technologies (which brought social media into existence) have given librarians options as regards the channel to use for informal scientific communication.

However, while librarians in developed countries have adopted the use of social media for informal scientific communication, thus leading to high and improved level of informal scientific communication among library practitioners, same cannot be said of librarians in developing countries like Nigeria. Specifically, past studies have generally not provided clear evidence of librarians' use of social media as informal communication channels for the purpose of scientific communication. From observation and interactions with librarians, it was gathered that many librarians are not aware of the use of social media for informal scientific communication. This lack of awareness of the use of social media may be the reason for the

poor use of social media for informal scientific communication as many librarians still rely only on traditional channels for informal scientific communication which have not really enhanced high level of informal scientific communication among librarians. It is on this note that this study was conducted to examine librarians' awareness of social media usage for informal scientific communication in university libraries in South-south Nigeria.

OBJECTIVES OF THE STUDY

The main objective of this study was to examine librarians' awareness of social media usage for informal scientific communication in university libraries in South-south, Nigeria. Specifically, this study sought to:

1. investigate the various social media tools available to librarians for informal scientific communication in University libraries in South-south Nigeria;
2. examine the extent of the librarians' awareness of social media usage for informal scientific communication;
3. identify the existing channels of informal scientific communication used by the librarians in the University libraries; and
4. find out the relationship between the librarians' awareness of social media usage and informal scientific communication in the university libraries.

RESEARCH QUESTIONS

The following research questions guided this study:

1. What are the various social media tools available to librarians for informal scientific communication in University libraries in South-south Nigeria?
2. What is the extent of the librarians' awareness of social media usage for informal scientific communication?
3. What are the existing channels of informal scientific communication used by the librarians in the University libraries?

HYPOTHESIS

The null hypothesis stated below was tested for this study at 0.05 significant level

1. There is no significant relationship between the librarians' awareness of social media usage and informal scientific communication in university libraries in South-south Nigeria.

LITERATURE REVIEW

- Theoretical framework

Several theories have been postulated to explain the awareness, acceptance and use of new products and technology. Among these are the Theory of Reasoned Action (TRA) propounded by Ajzen and Fishbein in 1980, the Technology Acceptance Model (TAM) propounded by Davis in 1989 and the Diffusion of Innovation (DOI) propounded by Rogers in 1962. However, Mohammed (2015) explained that the TRA and TAM does not universally explain people's awareness, acceptance and use of new technologies. To fill up this gap Mohammed (2015) suggested Rogers (1962) Diffusion of Innovation Theory as the determinant in explaining the adoption and spread of new technologies or ideas in a community over a period of time. On this premise, Rogers' diffusion of innovation theory was adopted and it formed the theoretical anchor for this study.

Diffusion of Innovation Theory

According to Rogers (1962), "diffusion refers to the process by which an innovation is communicated through certain channels over time among the members of a social system" (p.15). Diffusion research centres on the conditions, which increases or decreases the likelihood that members of a given culture will adopt a new idea, product, or practice. According to Rogers, "people's level of awareness toward a new technology [social media] is a key element in its diffusion" (p.16). In other words, the diffusion of innovation evaluates how, why, and at what rate new ideas and technology are communicated and adopted. Rogers identified five factors that strongly influence whether or not someone will adopt an innovation. These factors are: relative advantage, complexity, compatibility, trialability and observability. Roger's Innovation Decision Process theory stated that innovation is a process that occurs over time through five stages: knowledge, persuasion, decision, implementation and confirmation. Accordingly, Rogers (1962) stated that:

The innovation-decision process is the process through which an individual or other decision-making unit passes from first knowledge of an innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of the decision. (p.161).

Due to the novelty of computers and their related technologies, (such as social media) studies concerning technology diffusion in educational institutions have often focused on the first three phases of the innovation decision process (Agboola, 2013). Diffusion is a special type of

communication concerned with the spread of messages that are perceived as new ideas. Diffusion of innovation theory predicts that social media as well as interpersonal contacts provide information and influence opinion and judgment. The information flows through networks. The natures of networks and roles opinion leaders play in them determine the likelihood that the innovation will be adopted. The four main elements in the diffusion of new ideas are (i) The innovation: (ii) Communication channels: (iii) Time and (iv) The social system (context).

An innovation is an idea, practice or object that is perceived as new by an individual or other unit of adoption. The characteristics of an innovation as perceived by the member of a social system determine its rate of adoption. The characteristics are (i) relative advantage (ii) compatibility (iii) complexity (iv) trialability and (v) observability.

Relative advantage: - This is the degree to which an innovation is perceived as better than the idea it supersedes. The greater the perceived relative advantage of an innovation, the more rapid its rate of adoption is likely to be.

Compatibility: –This is the degree to which an innovation is perceived as being consistent with the existing values, past experiences and needs of potential adopters. An idea that is incompatible with the value and norms of a social system will not be adopted rapidly as an innovation that is compatible.

Complexity (Simplicity and ease of use): – This is the degree to which an innovation is perceived as difficult to understand and use. New ideas that are simpler to understand are adopted more rapidly than innovations that require the adopter to develop new skills and understanding. The users of social media are expected to acquire new skills such as to read from the screen, and not to be able to take the publication into their hands, which all can be considered as complexities of social media. Also, electronic equipment and network connection enabling all this are necessary. Requirement like this may slow the use (Howard, 2011).

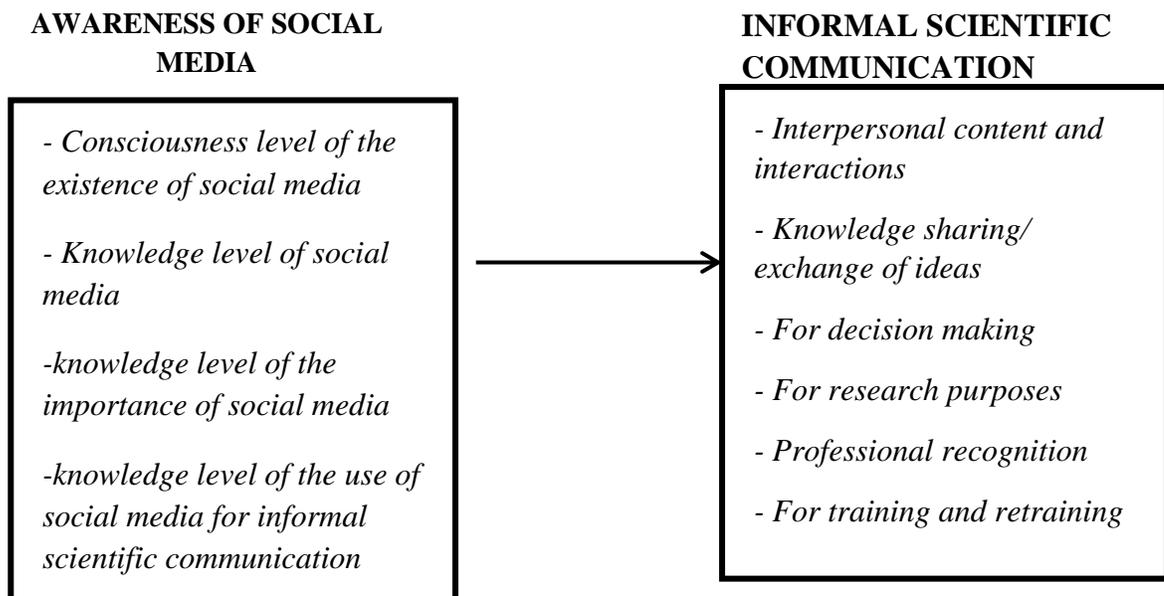
Trialability: – This is the degree to which an innovation may be experienced with on a limited basis. An innovation that is trialable represents less uncertainty to the individual who is considering it for adoption, who can learn by doing. In the case of social media, it implies their use through digital libraries, cyber café and Internet provided that the user has access to one or through open access journals that do not require payment (Howard, 2011).

Observability: –This is the degree to which the results of an innovation are visible to others. The easier it is for individuals to see the results of an innovation the more likely they are to use it.

The diffusion of innovation theory explains how information or idea can spread overtime through some channels and social structures in the society (Katz, Blumler & Gurevitch, 1974). The idea behind the theory is that for a new idea to spread there must be awareness stage, interest stage, evaluation stage and trial and adoption stages. Rogers and Shoemaker’s model of information diffusion Awareness and Use of Social Media: The Case of Facebook envisaged four stages: information, persuasion, decision or adoption and confirmation (McQuail, 2011). The relevance of this theory to this work stems from the fact that social media are at the evolving stage in developing countries and as such, different users will adopt them in varying degrees. While some librarians are still in awareness, interest and trial stages, others have adopted social media for informal scientific communication and have created an invisible college or virtual gathering. Also, others are yet to embrace this new media even though they are aware of them.

To advance the understanding of the diffusion of innovation theory, a model diagram showing the relationship between librarians’ awareness of social media usage and informal scientific communication is presented below in figure 1

Figure 1: A Research Model: Awareness of Social Media Usage for Informal Scientific Communication



- **Various Social Media Tools Available to Librarians**

Social media is a product of web-based or internet technologies and they depend on these online and mobile technologies to operate (Hamid, Waycott, Chang, & Kurnia, 2011). The different types of social media used by librarians according to Gruzd and Staves (2011) are Facebook, blogs, micro blogging, YouTube, twitter, Wikis, Mash Up, Digg, Delicious Second Life, Flickr, Picasa, amongst others. Hamid et. al (2011) explained that Facebook is a platform that features interactions between users. Facebook users can create a friend list right after membership process and can specify those who can or cannot take part in the interaction (friend selection and limitation of authority) when they sign in. Sharing can be conveyed among friends and enriched with comments. Hamid et. al. (2011) further stated “that one of the most used social media is the faceook. The primary use of Facebook by academic libraries is to promote the library with a library homepage” (p.22). Libraries advertise hours, locations, website information and newly acquired materials on Facebook. Greenhow (2009) added that by linking to the library’s website, the Facebook page acts as a portal to the library. Since librarians frequently use outside search engines for academic research, even a basic Facebook page can serve as a reminder to users the resources available at an academic library.

Also, Shafique, Anwar and Bushra (2010) explained that one common social media tool used by librarians in informal communication is blogs. A blog according to them is a user generated website where entries are much in journal style and displayed in a reverse chronological order. Marouf (2007) also agrees with Shafique et al. (2010) explanation of a blog, when they described blog as the social media-equivalent of personal Web pages and can come in a multitude of different variations from personal diaries describing the author’s life to summaries of all relevant information in one specific content area. Eperen and Marincola (2011) further noted that librarians’ use blog for promoting library and information resources and services. It is also used in a library for outreach, dissemination of information, building library image, internal and external communication, highlight new and valuable recently added materials and most importantly for promoting

In addition, Popoola (2014) opined that although blogs and other social media tools are very helpful in promoting informal scientific communication, other channels of informal scientific communication also promote scholarly communication. They can also be used for supporting the activities of the parent communities of libraries such as community news about

festivities, ceremonies, sports, etc. Rowlands, Nicholas, Russell, Canty, and Watkinson (2011) added that librarians can post news about the library as well as events occurring in the library. Librarians can periodically post messages, share information on a particular subject or issues both in the institutions and government and allow users to comment or contribute to the content., articles on thought provoking issues can be posted and expect instant reaction using blog (Ezeani & Igwesi, 2012). Marion and Omotayo (2010) noted that other types of social media librarians use in promoting library and information resources are YouTube, wikis, RSS feeds and Flickr.

Furthermore, Mohammed (2015) also asserted that “the various social media tools used by librarians for informal scientific communication include, but are not limited to, social networking sites such as Facebook, MySpace, and LinkedIn; blogs; micro-blogs such as Twitter and Yammer; virtual worlds such as Second Life; and sites for sharing documents, videos, and audio content such as YouTube and Slideshare” (p.44). Figure 2.5 illustrates, through a timeline, the history of the new social media since 2000

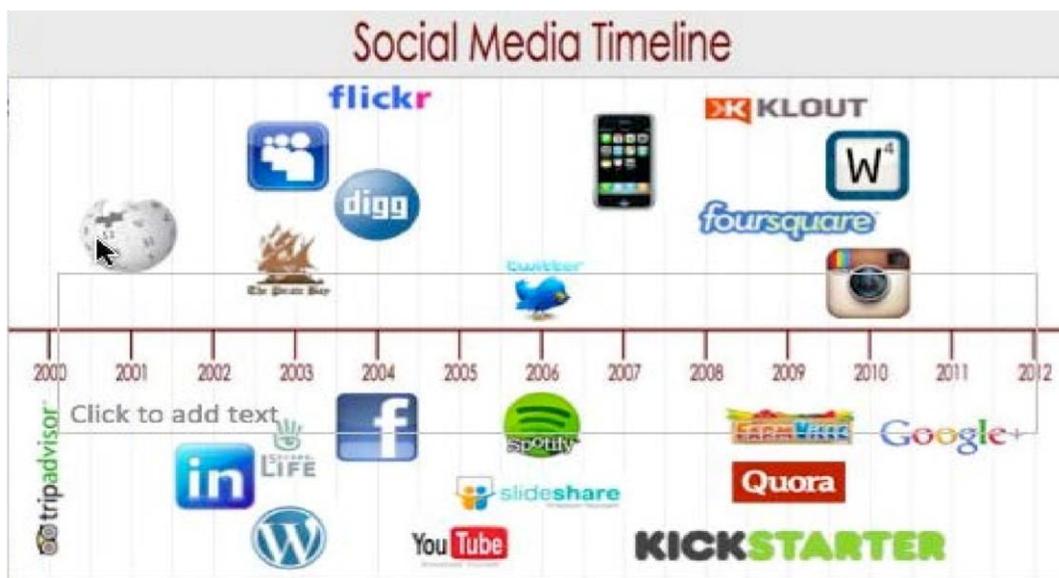


Figure 2.5: Social Media Timeline (adopted from Cruz and Jamias, 2013).

Conclusively, Marion and Omotayo (2010) explained that librarians use Twitter accounts to notify users of new relevant items from collection and events. Warnakula, and Manickam (2010) also opined that the ease of posting and sharing information on Twitter makes it an essential tool for librarians to reach their users. Librarians in Nigeria can use this platform to give users firsthand information on the latest happenings around the country. Users on the other

hand can send instant messages (IM) on complaints or ask questions on a particular issue and get a feedback on the spot using twitter.

- **Librarians' Awareness of Social Media Usage for Informal Scientific Communication**

In recent years, social media has become a national discuss and the development of efficient social media tool has received considerable attention in various areas of research. The wide use of popular social media enterprises such as Twitter and Facebook demonstrates the importance of this technology and the ways in which social media have changed the means of communication. Social media have also become one of the most attractive channels within the scientific community for transfer of scientific knowledge or work.

Accordingly, Internet World Stats (2013) asserted that "Internet has become the universal source of information for millions of people, at home, at school, and at work [and] in the social web people have found a new way to communicate" (p.2). Bullas (2014) confirmed that the Internet is revolutionizing the entire scholarly communication process and changing the way that researchers exchange information. He further noted that many librarians were already (as at 2001) converting their older documents to digital formats for greater dissemination via the Internet. Wagner (2008) stated that "today's library scientists and information experts have access to more data than ever before and are also aware of the use of social media for informal scientific communication" (p.12). Ease of access via the Internet makes it possible for users to communicate directly for the purpose of exchanging and improving ideas and data, thereby advancing science.

According to Folarin (2005), "most librarians in the developing countries are not aware of the impact and usefulness of social networking services, even the few that are aware are only aware of popular social media tools such as Facebook, what Sapp, and twitter and they are still struggling to find out the productive uses of these sites for professional communication" (p.9). In view of the above, Bik and Goldstein (2013) observed that librarians who are aware of the use of social media teds to engage more in informal scientific communication and social communication. Many students and possibly even some of the academic staff may be unaware that there is a subject specialist in their discipline. It is important for librarians to initiate contact with other librarians in order to develop a "public self". Getting librarians and other social media users to move beyond the social aspect of social media and use it for more serious and

productive outcome such as forming an invisible college which will enhance professional communication is often a challenge in Nigeria (Bullas, 2014). In fact, there is a general slogan in Nigeria that says leave Facebook and face your book. This assertion was corroborated by Caldas (2002) who explained that social media is usually seen as a vehicle for unserious communication.

Furthermore, Talja (2013) posited that, although the body of research on social media is growing despite the direction of the researches being on use. There is an understanding that librarians (especially) those in university libraries are not aware on the use of social media in communication for scientific purposes. Wagner (2008) further noted that aside from lack of awareness which hamper librarians' use of communication and information technology, phobia for the use of the different internet technologies is what drives many librarians to claim ignorance of the existence of such technologies with such functionalities.

- Informal Scientific Communication Channels used by Librarians in University Libraries

According to Talja (2013), "informal scientific communication refers to a communication between people (scholars) in a non-formal setting or through a non-formal means such as face-to-face discussion, exchange of personal communication, sharing views and opinions" (p.7). Informal scientific communication is sometimes used to describe the informal communication network of people like minds and similar interest.

There are different channels of informal scientific communication. Informal scientific communication can be done through traditional means or technological means. Whatever medium adopted by any group are fast and easy. Formal scientific communication on the other hand uses public and permanent vehicles such as books, journals and monographs to transmit information (Raini, 2010).

Furthermore, Borgman (2010) explained that informal scientific communication can take place anytime, anywhere and in any format". Traditionally, communication in the workplace between librarians who are co-located or who meet at local or national meetings is seen as an informal scientific communication. Additionally, reviewer notes, letters, telephone calls, and pre- and post-prints are in this category. Besides communicating to get advice, learn about new methods or theories, or hear about new results, librarians communicate informally to collaborate on research, co-author formal publications, and also to gossip and be creative (Allen, 2013).

Scholarly communication, as opposed to popular science communication, is embedded in the context of the scholarly tradition of the discipline and is shaped by the disciplinary rituals and perspectives (Folarin, 2005); nevertheless, general models have been developed to describe the general process, players, channels, and message types. Folarin in 2005 provided the standard model of the flow of scientific information that still stands as the basis for understanding the timeline and milestones for informal scientific communication (Garvey & Griffith, 2010). Garvey and Griffith trace the communication processes from the initiation of the work through the publication of the polished report in a peer-reviewed journal – a process that can extend up to five years. The steps in the Garvey-Griffith model are: earliest reports of data, research completed, manuscript started, national meeting, latest report, submission to the journal, journal publication (Garvey & Griffith, 2010).

The informal scientific communication is opposed to the goal of the formal process which is to publish a journal article in a peer-reviewed journal. Informal scientific communication is usually done via informal channels such as technical reports and conference presentations (Parveen, 2011).

Furthermore, Tyson (2010) observed that informal scientific communication is any form of communication that is devoid of formality; that is, it can take place anytime, anywhere, in any format. Reid (2007) stated that “face-to-face communication among professional colleagues in workplace is a perfect example of informal scientific communication” (p.21). He further explained that reviewer notes, letters, telephone calls, and pre- and post-prints are channels through which informal scientific communication is being carried out. Besides communicating to get advice, learn about new methods or theories, or hear about new results, librarians communicate informally to collaborate on research, co-author formal publications, and also to gossip and be creative.

Also, Shafique, Anwar and Bushra, (2010) explained that informal scientific communication by its nature is fortuitous and that there is no certainty that participants will share correct, complete, and the highest quality information available. Ideas diffuse more quickly via informal communication than through journal articles alone as they have champions who can provide subjective details on the innovation (Raini, 2010). Reid (2007) observed that traditional informal scientific communication channels is frequently used by librarians and is more effective

at providing richness and context to the data and is used to transfer tacit knowledge (know-how) while formal communication transfers facts and descriptions (know-what).

Traditionally, Mohammed (2015) noted that informal scientific communication is carried out in face-to-face meetings, in letters, and in pre-prints. Warnakula and Manickam (2010) surveyed two thousand librarians and found that the most likely source of research information is face-to-face contact. Research groups organize lectures, seminars, colloquia, and other informal intellectual social gatherings to encourage information transfer (Raini, 2010). Oyekan (2007) stated that:

the main forms of informal scientific communication in science, technology and medicine have been through verbal communication channels - personal contacts with colleagues and teachers - seminars, lectures, and discussions at conferences, fairs etc. These oral channels are often rapid and effective for conveying information. They allow a high degree of flexibility and are easy and pleasant to use. There is the possibility of a two-way communication between the producer and the receiver of the information. However, oral communication is seldom comprehensive; for example, it can be difficult to give detailed information about methods, constructions or results in a verbal presentation. Oral communication sometimes stimulates the hearer to look for some form of printed communication, but some information does not exist in a printed form, and can, therefore, only be reached by means of oral communication (P. 161).

Moreover, Howard (2011) observed that modern technologies have led to increase in the number of informal scientific communication channels. These new channels include electronic mail or e-mail, which is a hybrid between informal and formal communication and gives a rapid and relatively inexpensive method of direct communication between people or groups of people. Others include electronic conferences and bulletin boards. According to Crawford (2011), “these technology based channels of informal scientific communication provides boundless opportunities for the transfer of information” (p.11). The networks can be used to provide electronic conferencing facilities between users interested in a specific field or topic. This allows the users to exchange news and views and to seek advice from others with similar interests. A user can select which conference(s) to belong to. Many of the conferences are computer-oriented, covering such areas as the use of certain types of software or hardware. An example of such a conferencing system is the USENET available over the Internet by means of the remote access program Telnet.

METHODOLOGY

The study adopted survey research design to elicit responses on Librarians' awareness of social media usage for informal scientific communication in university libraries in South-south, Nigeria. The population consisted of 284 librarians in all university libraries in South-south, Nigeria. In Nigeria, librarian, as described by Librarians' Registration Council of Nigeria (LRCN) (2014), is a professional trained with a minimum of a first degree in Library and Information Science. Hence, librarians that were considered in this study were those with Bachelor degrees in Library and Information Science (BLIS) up-to Doctoral degree in library and Information Science. The university libraries used for this study consisted of those owned by the federal government, state government and private individual/organizations. The total enumeration sampling technique was used to study the entire population for this study.

The instrument for data collection in this study was the questionnaire. A self-developed questionnaire by the researcher consisting of sections A to D was adopted. Section A sought the demographic information of the respondents while Section B focused on the various social media tools available to librarians for informal scientific communication in University libraries in South-south Nigeria. Section C centered on the extent of the librarians' awareness of social media usage for informal scientific communication as Section D identified the existing channels of informal scientific communication used by the librarians in the University libraries.

The researcher subjected the instrument to face validity by sending out copies of the drafted Questionnaire to the panel of judges comprising of experts in Library and Information Science and at department of measurement and evaluation, both of Delta State University, Abraka, Nigeria. Corrected version of the questionnaire was used for a test-retest exercise. Content validity was done by administering 20 copies of the revised instrument to respondents outside the study sample but with common features. The analysis of twenty (20) respondents showed Cronbach Alpha reliability coefficient of **0.889** from the total items. 284 copies of the questionnaire were administered and 202 were retrieved and found useful, indicating a response rate of 71% which is considered adequate for the study.

Data were analyzed using an SPSS version 22 output format based on simple frequency count, percentage distribution, statistical mean, and Pearson's Product Moment Correlation Coefficient r .

RESULT AND DISCUSSION

Gender distribution of the Respondents

Table 1: Gender Distribution of the Respondents

Gender	Frequency	Percentage (%)
Male	94	46.5
Female	108	53.5
Total	202	100.0

Table 1 shows that the female respondents 108(53.5%) in this study are more than their male 94(46.5%) counterparts. This implies that female librarians participated more in the study than their male counterparts.

Age of the Respondents

Table 2: Age Distribution of the Respondents

Age	Frequency	Percentage (%)
20-30 years	14	6.9
31-40 years	87	43.1
41-50 years	81	40.1
51-60 years	16	7.9
61 years and above	4	2.0
Total	202	100.0

Table 2 shows that majority of the respondents in this study are within the age range of 31-40 years and 41-50 years. The table also shows that only 4 librarians representing 2% of the total respondents are within the age range of 61 years and above.

Staff Designation of the Respondents

Table 3: Distribution of the Respondents by Staff Designation

Staff Designation	Frequency	Percentage (%)
Assistant Librarian	41	20.2
Librarian II	58	28.7
Librarian I	39	19.3
Senior Librarian	29	14.4
Principal Librarian	15	7.4
Deputy University Librarian	11	5.5

University Librarian	9	4.5
Total	202	100.0

Table 3 shows that there are 58 respondents (representing 28.7% of the total respondents) and 41 respondents (representing 20.2% of the total respondents) in the Librarian II and Assistant Librarian designations respectively. Also, the table shows that there are only 9 respondents (representing 4.5% of the total respondents) in the University Librarians designation.

Working Experience of the Respondents

Table 4: Distribution of the Respondents by Working Experience

Working Experience	Frequency	Percentage (%)
1-5 years	39	19.3
6-10 years	49	24.3
11-15 years	66	32.7
16-20 years	23	11.4
21-25 years	11	5.4
26-30 years	6	3.0
31 years and above	8	4.0
Total	202	100.0

Table 4 shows that 66(32.7%) of the respondents had spent between 11-15 years in the library profession. This is followed by 49(24.3%) and 39(19.3%) of them who had spent 6-10 years and 1-5 years respectively. A few of them 6(3.6%) and 8(4%) had spent 25-30 years and 31 years and above respectively.

Answering of the Research Questions

Research Question One: What are the various social media tools available to librarians for informal scientific communication in University libraries in South-south Nigeria?

Data in Table 5 provides answer to this question.

Table 5: Social media tools available to librarians' for informal Scientific communication

Social media tools	Frequency	Percentage (%)
Facebook	162	80%
Whatsapp	115	60%
Twitter	92	46%
Blogs	69	34%
LinkedIn	82	41%
Instagram	76	38%
YouTube	99	49%
Flickr	36	18%
Google+	104	51%
MySpace	40	20%
Library Thing	25	12%
lib.rario.us	13	6%
Yammer	43	21%
Skype	28	14%

Table 5 shows that Facebook 162 (80%), Whatsapp 115 (60%), Google+ 104 (51%), and YouTube 99 (49%) have the highest frequency of usage among the different social media tools. This implies that librarians in university libraries in South-South Nigeria use Facebook, whatsapp, google+ and YouTube more for informal scientific communication.

Research Question Two: What is the extent of the librarians' awareness of social media usage for informal scientific communication?

Data in Tables 6 and 7 provide answers to this question.

Table 6: Librarians' awareness of social media for informal scientific communication

Awareness of social media for informal scientific communication	Frequency	Percentage (%)
Yes	186	92.1
No	16	7.9
Total	202	100.0

Table 6 shows that majority of the librarians 186(92.1%) agreed that they are aware of the use of social media for informal scientific communication while 16 (7.9%) of them are not aware. This implies that librarians in university libraries in South-South Nigeria are aware of the use of social media tools such as Facebook, Whatsapp, Twitter, Blogs, LinkedIn, Instagram, Skype, Flickr, Google+, MySpace, LibraryThing, Lib.rario.us, Yammer and YouTube for informal scientific communication.

Table 7: Extent of Librarians’ awareness of use of social media for Informal scientific communication

Social media tools	Mean
Facebook	3.31
Whatsapp	2.82
Twitter	2.58
Blogs	2.56
LinkedIn	2.71
Instagram	2.31
Skype	1.84
Flickr	2.73
Google+	2.11
MySpace	2.21
Library Thing	1.89
lib.rario.us	1.63
Yammer	1.58
Youtube	2.74
Aggregate	2.40
Criterion	2.50

Table 7 shows that librarians’ level of awareness of seven social media tools (Facebook, Whatsapp, Twitter, Blogs, LinkedIn, Flickr and YouTube) is high. While their level of awareness of the remaining social media tools (Instagram, Skype, Google+, MySpace, LibraryThing, Lib.rario.us and Yammer) is low. The table also shows that the calculated mean for the extent of librarians’ awareness of use of social media for informal scientific communication is 2.40. This

is less than the criterion mean of 2.50. It can therefore be concluded that the librarians' extent of awareness of the use of social media for informal scientific communication in university libraries in South-South Nigeria is low.

Research Question Three: What are the existing channels of informal scientific communication used by the librarians in the University libraries?

Data in Tables 8 and 9 provide answers to this question.

Table 8: Channels of informal scientific communication used by librarians

Channels	Agree		Disagree	
	No.	%	No.	%
face-to-face contact	64	31.7	138	68.3
Letters	24	11.9	178	88.1
pre-prints	21	10.4	181	89.6
Lectures and seminars	64	31.7	138	68.3
reviewer notes	60	29.7	142	70.3
telephone calls	20	9.9	182	90.1
post-prints	5	2.5	197	97.5

Table 8 shows that the channels of informal scientific communication frequently used by librarians include face-to-face contact with professional colleagues and lectures & seminars 64(31.7%) respectively, Letters 24(11.9%), pre-prints 21(10.4%), and telephone calls 20(9.9%). This implies that a few of the librarians make use of the various channels for informal scientific communication.

Table 9: Librarians’ extent of use of existing channels for informal Scientific communication

Channels	Mean
face-to-face contact	3.75
Letters	3.28
pre-prints	2.35
Lectures and seminars	3.39
reviewer notes	2.43
telephone calls	3.50
post-prints	2.30
Aggregate	3.00
Criterion	2.50

Table 9 shows a calculated mean of 3.00 for Librarians’ extent of use of existing channels of informal scientific communication. Since the calculated mean is greater than the criterion mean of 2.50, it can be concluded that the librarians’ use of the various existing channels of informal scientific communication in university libraries in South-south Nigeria is to a high extent.

Testing of the Hypothesis

Hypothesis: There is no significant relationship between the librarians’ awareness of social media usage and informal scientific communication in university libraries in South-south Nigeria.

The result is shown in Table 10

Table 10: Relationship between awareness of social media and informal scientific communication

		Awareness of the use of social media	Informal Scientific Communication
Awareness of the use of social media	Pearson Correlation	1	.384**
	Sig. (2-tailed)		.000
	N	202	202
Informal Scientific Communication	Pearson Correlation	.384**	1
	Sig. (2-tailed)	.000	
	N	202	202

From Table 10, Pearson Correlation Coefficient $r (= 0.384)$. Since the significant value (Sig. 2-tailed) is 0.000 (which is less than 0.05), it can be concluded that there is a significant relationship between awareness of the use of social media and informal scientific communication by librarians in university libraries in South-South Nigeria. The null hypothesis is therefore rejected implying that an increase in the awareness of social media by librarians may lead to a corresponding increase in informal scientific communication and vice versa.

DISCUSSION OF THE FINDINGS

This section discusses the findings of the study. The findings are being discussed drawing inferences from authors' views in the literature review and relating them to the researcher's findings from the study. The discussion is presented under eight (8) subheadings following the purpose of the study.

Various Social Media Tools Available to Librarians for Informal Scientific Communication

The study revealed that librarians in university libraries in South-South Nigeria use that Facebook, What sap, Google+, twitter and YouTube for informal scientific communication. The study also revealed that some librarians also use LinkedIn, Blogs, Instagram and Flickr for informal scientific communication. This finding corroborates with Mohammed's (2015) that "the social media tools used by librarians for informal scientific communication include social networking sites such as Facebook, MySpace, and LinkedIn; blogs; micro-blogs such as Twitter and Yammer; virtual worlds such as Second Life; and sites for sharing documents, videos, and audio content such as YouTube and Slideshare. This finding is also in agreement with Gruzd and Staves' (2011) that the different types of social media used by librarians are Facebook, blogs, microblogging, YouTube, twitter, Wikis, Mash Up, Digg, Delicious Second Life, Flickr, Picasa, amongst others.

The study also revealed that, among the various social media tools available, Facebook and what sap are the most frequently used social media by librarians for informal scientific communication while social media tools such as Skype, Yammer, Lib.rario.us, LibraryThing, MySpace, Flickr and Instagram are not frequently used by librarians. This is in conformity with Hamid et al's (2011) statement "that one of the most used social media is the Facebook and the primary use of Facebook by librarians in academic libraries is to promote the library with a library homepage and communicate with other professionals". Libraries advertise hours, locations, website information and newly acquired materials on Facebook.

Extent of librarians' awareness of social media usage for informal scientific communication

The finding on librarians' awareness of the use of social media for informal scientific communication shows that librarians are aware of the use of social media for informal scientific communication. This finding corroborates that of Wagner (2008) that today's library scientists

and information experts have access to more data than ever before and are also aware on the use of social media for informal scientific communication. This is also in line with Bullas' (2014) that librarians' are aware of social media usage and its ease of access which makes it possible them to communicate directly for the purpose of exchanging and improving ideas and data, thereby advancing science.

The result also shows that the general extent of awareness of the use of social media for informal scientific communication among librarians' in university libraries in South-South Nigeria is low. Although, many librarians are aware to a high extent on the use social media tools such as Facebook, what Sapp, blogs and twitter for informal scientific communication, their knowledge of other numerous professional social media tools for informal scientific communication is very low. This finding is in agreement with Folarin's (2005) that most librarians in the developing countries are not aware of the impact and usefulness of social networking tools and services, even the few that are aware are only aware of popular social media tools such as Facebook, what Sapp, and twitter and they are still struggling to find out the productive uses of these sites for professional communication.

Channels of informal scientific communication used among librarians in University libraries

The findings on the various traditional channels of informal scientific communication used by librarians shows that the channels of informal scientific communication frequently used by librarians include face-to-face contact with professional colleagues, lectures and seminars, Letters, pre-prints, and telephone calls. This finding corroborates those of Borgman's (2010) and Allen's (2013) that "informal traditional communication in the workplace between librarians who are co-located or who meet at local or national meetings is seen as an informal scientific

communication. Additionally, reviewer notes, letters, telephone calls, and pre and post-prints are in this category.

Also, the finding agrees with Reid's (2007) that, "face-to-face communication among professional colleagues in workplace is a perfect example of informal scientific communication and further explained that reviewer notes, letters, telephone calls, and pre- and post-prints are channels through which informal scientific communication is being carried out.

Furthermore, the findings also revealed that librarians' use of the various existing traditional channels of informal scientific communication in university libraries in South-South Nigeria is to a high extent. This revelation shows conformity to Reid's (2007) that traditional informal scientific communication channels is frequently used by librarians and is more effective at providing richness and context to the data and is used to transfer tacit knowledge (know-how).

Relationship between awareness of the use of social media and informal scientific communication

The result of the hypothesis tested revealed that there is a significant relationship between awareness of the use of social media and informal scientific communication by librarians in university libraries in South-South Nigeria. This further implies that an increase in the awareness of the use of social media by librarians may lead to a corresponding increase in informal scientific communication and vice versa. This finding is in agreement with Bik and Goldstein's (2013) that, "librarians who are aware of the use of social media for informal scientific communication tends to engage more in informal scientific communication and social communication. This study further revealed that the more librarians are aware of the use of social media for informal scientific communication, the more they use social media and this leads to a corresponding increase in informal scientific communication among librarians in university libraries in South-South Nigeria.

CONCLUSION

Informal scientific communication is very essential among librarians in university libraries in order to help them gain new knowledge in the library profession. The use of social media for informal scientific communication among librarians is important in university libraries as it will help librarians to keep themselves abreast of new innovations in their profession and further help them to provide services that will meet the varying needs of their patrons. However, without adequate awareness and knowledge of the different social media tools, it is impossible to effectively use social media for the purposes of scientific communication.

The use of social media for informal scientific communication is no doubt a modern day phenomenon facilitated by advancement in technology. It is a fact that librarians in university libraries in South-south Nigeria seek more channels of informal scientific communication in addition the traditional channels of informal scientific communication which includes face-to-face communication among professional colleagues, telephone conversation, lectures and seminars, letters, pre-prints and post-print. Although various forms of social media applications exist, the study did provide valid empirical evidence that librarians are aware of the use of social media for informal scientific communication but the extent of awareness is low. The extent of usage of the social media tools for informal scientific communication is also low as many librarians only use Facebook and what Sapp for the purposes of scientific communication. The study affirms that a significant relationship exist between librarians awareness, use of social media and informal scientific communication.

RECOMMENDATIONS

In the light of the findings of this study, the following recommendations are made:

1. University Librarians and other library administrator should sensitize library staff on the use of different social media tools for informal scientific communication because the world is now a global village
2. Librarians should cultivate the habit of using modern technologies (such as computers, social media tools) for information sharing and dissemination because it is relatively cheaper and allows for wider participation.
3. Libraries should train staff periodically on the use of the different social media in carrying out library services. This will enable the librarians use social media for the purposes of scientific communication among professional colleagues.
4. Library associations should encourage the creation of invincible colleges using different social media tools such as Facebook, whatsapp, and blogs as this will promote the use of social media for informal scientific communication among librarians.
5. Librarians should acquire in-depth knowledge about social media so as to put it into more effective use as well as using it beyond personal or individual uses. The acquisition of knowledge can come in various formats and the employer institution should also support staff towards this direction.

CONTRIBUTIONS TO KNOWLEDGE

This study has no doubt contributed to the body of existing knowledge in a number of ways:

1. The study has been able to establish the extent of librarians' awareness of social media for informal scientific communication in university libraries in South-south Nigeria.
2. The study has shown unequivocally that a significant relationship exists between librarians' awareness of social media usage and informal scientific communication in university libraries in South-south Nigeria.

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