

**AWARENESS AND USE OF SOCIAL MEDIA FOR INFORMAL SCIENTIFIC
COMMUNICATION AMONG LIBRARIANS IN UNIVERSITY LIBRARIES IN
SOUTH-SOUTH, NIGERIA**

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**DELTA STATE UNIVERSITY,
ABRAKA.**

MAY, 2017.

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**IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD
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INFORMATION SCIENCE**

MAY, 2017.

DECLARATION

I, **OkuonghaeOmorodion**, declare that this is an original research work carried out by me in the Department of Library and Information Science, Delta State University, Abraka.

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CERTIFICATION

I hereby certify that this dissertation was carried out
by **Okuonghae Omorodion** under my supervision, in the Department of Library and
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Dr. E.I. Achugbue
(Supervisor)

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Date

DEDICATION

This research work is dedicated to God Almighty for His grace, mercies, protection and provision for me and my family and also to my lovely mother, without whose caring support and prayers it would not have been possible for me to complete this dissertation.

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ABSTRACT

The study examined awareness and use of social media for informal scientific communication among librarians in University libraries in South-South, Nigeria. The specific objectives of the study were aimed at examining the extent of awareness and use of social media for informal scientific communication among librarians, the challenges faced by librarians in the use of social media, the various channels of informal scientific communication as well as the relationship between librarians' awareness, use of social media and informal scientific communication. Five research questions were asked and three hypotheses were tested for this study. The study adopted the descriptive survey research design. The population of the study was 284 respondents drawn from all the University libraries in South-South, Nigeria. The sample size for this study was 284 respondents and the complete enumerative sampling technique was adopted. The instrument used for data collection was the questionnaire. The data collected were analysed using descriptive and inferential statistics tools. Findings from the study indicated that librarians in University libraries in South-South Nigeria are aware and use social media for informal scientific communication, although, the extent of awareness and use are low. The study also revealed that librarians use Facebook, WhatsApp, Google+, twitter and YouTube more than other social media tools for informal scientific communication. The study showed a significant relationship between awareness of the use of social media and informal scientific communication, as well as a significant relationship between use of social media and informal scientific communication. There was also a significant relationship between awareness, use of social media and informal scientific communication. Based on the findings, the researcher recommended that University Librarians and other library administrators should sensitize librarians on the use of different social media tools for informal scientific communication because the world is now a global village. Also, Library associations and administrators should encourage the creation of invisible colleges using different social media tools such as Facebook, WhatsApp, and blogs as this will not only promote the use of social media for informal scientific communication, but will also improve the level of informal scientific communication among librarians.

CHAPTER ONE

1.1 Background to the Study

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 enable 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 semiotic rules (Popoola, 2014). The concept of communication have some basic steps which include 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 the 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 communications. 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 alter casting 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 channels (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 include 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 tool 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 benefits 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 of 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 centres 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 factors that can affect the informal scientific communication among librarians in this technologically advanced era. Awareness of use of social media and librarians' use of social media are factors that can affect informal scientific communication among librarians, as most interactions among professionals are now done using social media tools (Hellou& Rahim, 2011).

Awareness of the use 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). 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 them. 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's (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)".

Another variable that may influence the informal scientific communication among librarians in this digital age is librarians' use of social media. According to Mukherji (2009), "the use of social media is the act or practice of employing social media in carrying out different activities such as communication, information or displaying of a particular image" (p.5). Zuccala (2004) explained that the use of social media by librarians will indeed foster informal scientific

communication among librarians. While there are many uses of social media, Librarians can use social media tools to communicate and share professional knowledge, new ideas and innovations. The level of use of social media by librarians may facilitate connection and communication between librarians and library organizations. The use of social media enhances available services and therefore extends and expands upon existing professional conversations and research (Warnakula&Manickam, 2010). New social media tools promote diversity and facilitate communication with a large number of persons in a convenient manner. These new technologies offer unprecedented insights into new dimensions in the field of scientific communication. Modern technology has radically changed the processes of scientific communication, affecting how librarians undertake informal communication activities and how they interact or collaborate with their colleagues. Veletsianos and Kimmons (2013) pointed out that communication technology has vastly enhanced informal scholarly conversations. Due to the fast and easy accessible forms of communication provided by advanced technologies (social media), librarians can expand and enhance their communications around the world using social media. Parveen (2011) observed that the use of social media by librarians have made it possible for librarians on opposite sides of the globe to discuss scientific and professional issues online. As technology advances, scientific communication methods will advance as well. Although, Librarians in Nigeria are yet to fully embrace the use of social media tools for informal scientific communication. The reason for the poor use of social media tools for informal scientific communication by librarians

in Nigeria may be largely due to the fact that many of them are not aware of the full professional use of social media tools (Omolayole, 2008). Poor level of awareness of the use of social media and poor level of use of social media by librarians, will limit librarians from communicating, sharing ideas, knowledge and innovations among colleagues in different parts of the world using social media, thus affecting the informal scientific communication among librarians. It is against this background that the researcher seeks to investigate the awareness and use of social media for informal scientific communication among librarians in University libraries in South-South, Nigeria.

1.2 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 an 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. Those who are aware of social media only see it as a medium of social interaction. This lack of awareness of social media may be the reason for the poor usage 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. Also, observation revealed that many librarians do not use social media, which further hinders informal scientific communication process among librarians. This study seeks to examine the awareness and use of social media for informal scientific communication among librarians in University libraries in South-South, Nigeria.

1.3 Research Questions

The following research questions guided this study;

1. To what extent are librarians in University libraries aware of the use of social media for informal scientific communication?

2. What are the various social media tools used by librarians for informal scientific communication?
3. To what extent do librarians in University libraries use social media for informal scientific communication?
4. What are the existing channels of informal scientific communication used by librarians in University libraries?
5. What are the challenges faced by librarians in the use of social media for informal scientific communication?

1.4 Research Hypotheses

The following null hypotheses were tested for this study at 0.05 significant level;

1. There is no significant relationship between awareness of the use of social media and informal scientific communication among librarians in University libraries in South-South, Nigeria.
2. There is no significant relationship between use of social media and informal scientific communication among librarians in University libraries in South-South, Nigeria.
3. There is no composite significant relationship between awareness, use of social media and informal scientific communication among librarians in University libraries in South-South, Nigeria.

1.5 Purpose of the Study

The main purpose of this study was to examine the awareness and use of social media for informal scientific communication among librarians in University libraries in South-South Nigeria. Specifically, this study seeks to:

1. examine the extent to which librarians in University libraries are aware of the use of social media for informal scientific communication.
2. investigate the various social media tools used by librarians for informal scientific communication.
3. ascertain the extent to which librarians in University libraries use social media for informal scientific communication.
4. identify the existing channels of informal scientific communication used among librarians in University libraries.
5. examine the challenges faced by librarians in the use of social media for informal scientific communication.
6. find out the relationship between awareness of the use of social media and informal scientific communication among librarians in university libraries in South-South Nigeria.
7. determine the relationship between use of social media and informal scientific communication among librarians in university libraries in South-South Nigeria.
8. ascertain the composite relationship between awareness, use of social media and informal scientific communication among librarians in university libraries in South-South Nigeria.

1.6 Significance of the Study

The study is expected to be of great benefit to Librarians, library administrators, social media developers and researchers. The study will be beneficial to librarians as it will not only expose them to the different channels of informal scientific communication, but will also help them to improve on their level of informal scientific communication among professional colleagues with the awareness this study will bring on the use of social media for informal scientific communication. The study will also enlighten them on the various social media tools that can be used for informal scientific communication.

Library administrators will also benefit from this study as the result of the study will guide them in the formulation of policies especially as it relates to informal scientific communication. Also, social media developers will benefit from this study as the result of the study will enlighten them on the challenges librarians face in the use of social media tools for informal scientific communication. This will in turn guide them in creating newer versions of social media software. Finally, researchers will also benefit from this study as the result of this study will serve as a valuable literature for future researches in a similar area.

1.7 Scope and Delimitation of the Study

The scope of this study focused on the awareness and use of social media for informal scientific communication among librarians in University libraries in South-South Nigeria. Effort was made in examining the extent of librarians' awareness of social media usage for informal scientific communication, as well as

the various social media tools used for informal scientific communication and the extent of its usage among librarians in university libraries in South-South Nigeria. The different existing channels of informal scientific communication were also highlighted, as well as the challenges librarians encounter in the use of the various social media tools for informal scientific communication.

The delimitation of this study was based on the South-South geo-political zone of Nigeria. All University libraries in the South-South geo-political zone of Nigeria were used for this study. The University libraries included those from the federal, state and the privately owned University libraries in South-South Nigeria.

1.8 Operational Definition of Terms

The following terms are defined as used in the study.

Awareness of Social media: It is the knowledge and understanding of social media especially as it relates to its development and usage among people.

Informal Scientific Communication: This refers to a professional (scholarly) communication among scholars through a non-formal channel that has not undergone peer review or edited by publishers, and it is not necessarily retrievable through various information systems

Librarian: This refers to a professional in managing library, one who is skilled and trained to perform library duties in a library and holds a minimum of Library and Information Science degree or a bachelor's degree in other discipline plus a master's degree in Library and Information Science.

Social Media: A variety of informal online channels, sites, platforms, and mobile phone applications that provide services to individuals or groups for various

activities, such as exchanging and sharing information and knowledge in textual, pictorial, audio, or video formats, or other multimedia communications that reflect social networks and relations among individuals who share similar interest and activities.

South-South: This is one of the six geo-political zone in Nigeria and it consist of six states in Nigeria namely; Edo, Delta, Akwa-Ibom, Cross-River, Bayelsa and Rivers.

Use of Social Media: It refers to the act or practice of employing social media in carrying out different activities such as communication or discharge of internet based services.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter presents a comprehensive review of related literature on awareness and use of social media for informal scientific communication among librarians in University libraries in South-South Nigeria. It is reviewed under the following headings:

- 2.1 Theoretical Framework
- 2.2 Librarians' Awareness of the Use of Social Media for Informal Scientific Communication
- 2.3 Various Social Media Tools Used by Librarians for Informal Scientific Communication
- 2.4 Librarians' Use of Social Media for Informal Scientific Communication
- 2.5 Informal Scientific Communication Channels used among Librarians in University Libraries
- 2.6 Challenges faced by Librarians in the Use of Social Media for Informal Scientific Communication
- 2.7 Appraisal of the Reviewed Literature

2.1 Theoretical Framework

Several theories have been postulated to explain the awareness, acceptance and use of new products and technology. Among these are the theories of Ajzen and Fishbein (1980) The Theory of Reasoned Action (TRA), Davis (1989) The Technology Acceptance Model (TAM) and Rogers (1962) The Diffusion of Innovation (DOI). 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 nature 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 these 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).

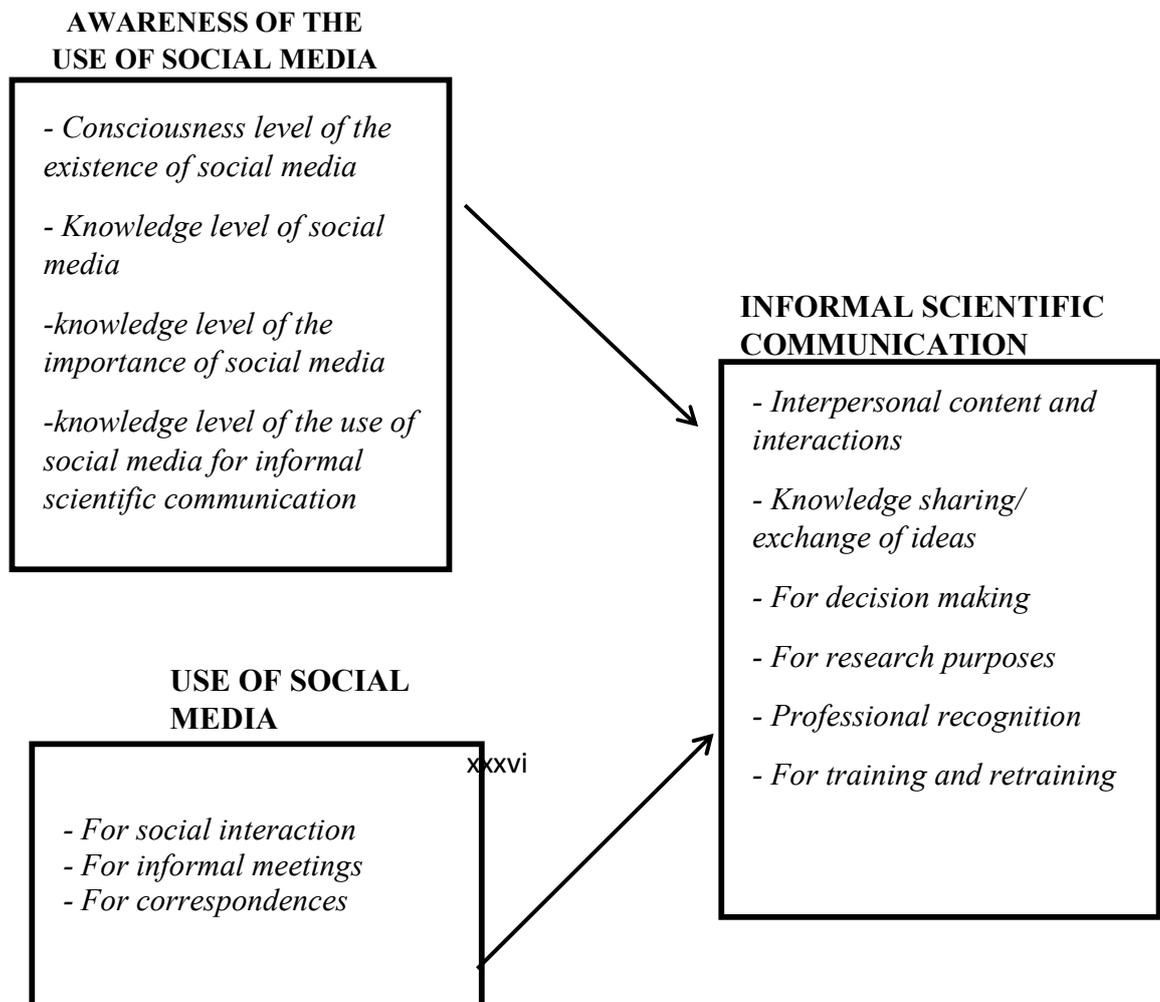
Observability: –This is the degree to which the results of an innovation are visible to others. The easier it is for individuals to see the results of an innovation, the more likely they are to use it.

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 & 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 awareness of social media, use of social media and informal scientific communication among librarians is presented in figure 2.1

Figure 2.1: A Research Model: Awareness and use of Social Media for Informal Scientific Communication



2.2 Librarians' Awareness on the Use of Social Media in 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, WhatsApp, 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 tend 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, the focus and 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.

2.3 Various Social Media Tools Used by 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, microblogging, 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 Facebook. 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 Webpages 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

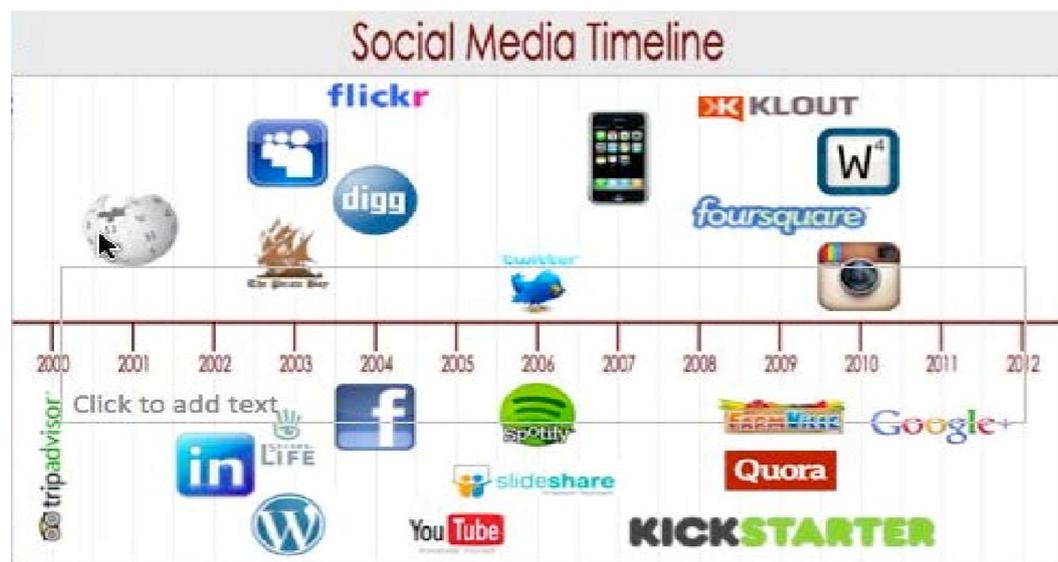


Figure 2.5: Social Media Timeline (adopted fromCruz and Jamias, 2013).

Conclusively, Marion and Omotayo(2010), explained that librarians use Twitter accounts to notify users of new relevant items from collection and events. Warnakula, andManickam (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.

2.4 Librarians’ Use of Social Media in Informal Scientific Communication

Technologies have provided an unprecedented dimension to the concept of invisible college in the field of scientific communication among librarians. The communication have not changed in essence, it is still based on personal contact. But the means by which to make such contact have changed dramatically. Veletsianos, Kimmons and French (2013) confirmed that interest in social media as a communication tool has been greatly influenced by young librarians. However, the use of social networks and participation in social media for scientific purposes by librarians has not been fully explored. Moreover, Veletsianos et al (2013) asserted the relative lack of understanding of librarians’ practices in social networks, and posed the question, “What do librarians do in social networks? And what do their naturalistic practices reveal about scientific practice?”(p.33). He observed that, while one may make assumptions based on what is made public via social media, Twitter reveals only small amounts of

information and leaves no existing documentation or evidence of scientific activities outside a particular forum. Veletsianos and Kimmons (2013) suggested that a study of scientific practices as a whole would shed useful light on online scholarly communicative behavior. He noted that librarians prefer to share their professional investigations, ideas, and queries with like-minded individuals, such as other librarians.

In addition, Warnakula and Manickam (2010) study indicated that the use of social media does not affect informal scientific communication as many librarians are still limited to the use of other traditional channels of informal scientific communication, while those who use social media limit themselves to the traditional uses of social media. For instance, most librarians use social media for making and maintaining connections with friends. Priem and Hemminger (2010) found that many librarians have become active participants in the new social media and predicted that librarians' use of social media would continue to increase. Certain types of social media are more frequently used by librarians for the purposes of informal communication and exchange of information, such as blogs, micro-blogging sites, and wikis (Gruzd & Staves, 2011). Research on the use of social media by librarians or any professional group is negligible, and relatively few studies have examined librarians' use of social media for professional purposes (Greenhow 2009; Veletsianos & Kimmons 2013; Veletsianos et al. 2013). Social media are informal channels of communication that facilitate interpersonal interaction between librarians. Previous studies report that librarians, especially those in developing countries usually use personal

contact for informal communication and information exchange. Communication among scholars usually takes place in direct and informal exchanges, typically between individuals or within a small group (Raini, 2010; P.10). In this case, interaction among librarians does not require that they be geographically near one another, as the new technologies remove geographic barriers. Social media and other communication channels facilitate communication and personal interaction among librarians, either nationally or globally.

However, the use of social media in recent years has increased globally (Reid, 2007). To understand the major changes taking place in the processes of scientific communication, Zuccala (2004) stated that the use of social media by different library groups has brought into existence different invisible colleges which enable librarians to interact and communicate informally. Also Urista, Dong, and Day, (2009) explained that it seems that invisible colleges in various library associations prefer to use modern communication channels for informal communication. An examination of the social processes in which librarians engage can reveal what informal communication channels are used most frequently. As new technologies become more common among individuals and societies, librarians use multiple informal communication channels, such as social media in scientific communication. Tyson (2010) found out that although many studies have focused on informal communication channels and their users, they have not provided clear evidence regarding the appropriate informal communication channels that librarians prefer for scientific communication.

In conclusion, Parveen (2011) opined that apart from the use of social media in informal scientific communication, librarians are also known to use social media to deliver a blend of customer service, news and updates, content/collection promotion, dissemination of the institutions' research output, provision of educational tools and resources and for building relationships both within and outside of the institution. A wide range of social media channels are used, but as yet there is limited differentiation between how they are used. Facebook and Twitter remain dominant, but visual channels such as YouTube and Interest are rapidly on the rise.

2.5 Informal Scientific Communication Channels used among 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 with 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.

2.6 Challenges Faced by Librarians in the Use of Social Media in Informal Scientific Communication

University librarians, today, have discovered the need to communicate and promote their services using different platform and social media have given them new options in informal scientific communication and in promoting their resources and services (Algarni, 2014). Libraries now advertise the resources and services on their Facebook pages, twitter and blog etc. Unfortunately, Adeyemi (2012) stated that “a number of challenges militate against librarians’ effective utilization of social media in Nigerian University libraries” (p.5). He stated that it is embarrassing that stable power supply in the country is still a mirage till date. Agboola (2013) observed that the issue of epileptic power supply in most African countries has in no small measure affected the use of social media applications by librarians as all the social media application are powered by electricity but the supply of electricity in Africa is nothing to write home about. Supporting this,

Adeyemi (2012) stated that “power outage is a problem militating against information/internet provision and use in African countries” (p.13). Similarly, Ossai-Ugbah (2012) claimed that power outages increase the general overhead cost of utilizing social media applications, thus having a negative impact on the use of social media for marketing library and information services in Nigerian University libraries. The question that bothers everyone is how then can university librarians be able to effectively use social media for informal communication in a cost-effective manner?

Furthermore, McQuail (2011) stated that “lack of awareness among librarians on the use of social media for scholarly purposes is a challenge as most librarians in the developing nations are not aware of social media services, even the few that are aware are still struggling to find out the productive uses of these sites for library services and communication” (p.17). Librarians are also not aware of the protocols involved in social communication. They also noted that large percentage of librarians are possibly unaware, even some of the academic staff may be unaware that social media can be used as a tool to foster informal scientific communication among librarians around the globe. Bullas (2014) opined that “it is important for librarians to initiate contact with fellow librarians and clients in order to experiment with developing a public self”. Ezeani and Igwezi (2012) explained further that getting people and social media users (Librarians inclusive) to move beyond the social aspect of social media and to use them for more serious and productive outcome such as scholarly communication through an invisible college is often a challenge in Nigeria.

Also, Hutton (2008) highlighted privacy concern as a challenge towards the use of social media by librarians. He noted that social media poses increasingly online security risk because library users' personal information on social media can be used by financial cronies. Explaining this, Reid (2007) argued that just a name, address and birth date (let alone a social security number) provides more than enough ammunition for criminals to hack into financial records and compromise a user's personal information. In another vein, Bik and Goldstein (2013) observed that series of advert messages on online social networks sometimes irritates some people. Having this in mind, librarians are faced with a challenge of being stalked with constant advertisements or promoting messages on online social media.

Another challenge librarians' face in the use of social media for informal scientific communication according to Oyekan (2007) is low level of technology penetration. There is a general inadequacy in the level of technology in the Africa. This can be attributed to high cost of tariffs in the control and government negligence. Nigeria look forward to a time when each home and every office would be connected to the internet at little or no charge as it is in developed nations. Sadly, internet connection in the country is most times available only to the rich (Ezeani&Igwezi, 2012). Omolayole (2008) asserted that "there is always online network problem or a cable network problem" (p.19). That is when cables that connect different parts of a network are cut or shorted or hasa connectivity problem that is when there is a malfunction of a connectivity component like a hub, a router or a switch. Other network problems that can arise are excessive

network collusions, software problems and use of the same IP address (Ezeani&Igwesi, 2012). Ezeani and Igwesi (2012) added bandwidth problems to this, noting that most institutions have limited bandwidth to support this practice of internet connectivity. They concluded that poor connectivity can frustrate effective online participation. Other problems encountered in the use of social media for promoting library and information product and services are lack of technical knowledge and expertise, high cost of ICTs, corruption and negligence, little government intervention, resistance to change and a host of others.

Conclusively, Bik and Goldstein (2013) stated “that a very common challenge in the use of social media for informal scientific communication is the lack of technical knowhow and awareness of the full functionalities of the various social media applications” (p.18). Reid (2007) noted that most librarians in African countries are not aware of social networking services, and the value of social media in informal scientific communication. Even the few that are aware are still struggling in the use of social media for scholarly scientific communication.

2.7 Appraisal of Reviewed Literature

Reports of empirical studies show that librarians in African libraries have a lot of catching up to do as regards the awareness and use of social media for informal scientific communication. The literature reviewed revealed that the level of Librarian’s awareness of social media for informal scientific communication is higher in developed countries than in developing countries like Nigeria.

It is pertinent to note however, that librarians in developing countries like Nigeria mainly use traditional and oral channels of informal scientific

communication, and this comes with its own limitations. From the literature reviewed, the awareness and use of social media for informal scientific communication were discussed, the various social media tools used by librarians for informal scientific communication were exhaustively discussed, while librarians use of social media for informal scientific communication was also comprehensively discussed. Also, from the reviewed literature, the various informal scientific communication channels used by librarians were extensively discussed.

Therefore, an understanding of awareness and use of social media for informal scientific communication among librarians in University libraries in South-South may allow Librarians to involve more in informal scientific communication using modern technological tools, thus bridging the knowledge gap between librarians in Nigeria and those from developed countries. This is the gap the study is set out to fill.

CHAPTER THREE

RESEARCH METHODS AND PROCEDURES

This chapter describes the methods and procedures to be used by the researcher in carrying out the study.

3.1 Research Design

3.2 Population of the Study

3.3 Sample and Sampling Technique

3.4 Research Instrument

3.5 Validity of the Instrument

3.6 Reliability of the Instrument

3.7 Method of Data Collection

3.8 Method of Data Analysis

3.1 Research Design

The study employed a descriptive survey research design to gather information on the awareness and use of social media for informal scientific communication among librarians in University libraries in South-South Nigeria. According to Nworgu (2015), “a descriptive survey design is one in which a group of people or item is studied by collecting and analyzing data from only a few people or items considered to be representative of the entire group”(p.91). This research design was chosen because it is based on the views and opinions of the respondents as well as the record available in the area of study. The survey

research design is also widely employed in the study of significant problems in Library and Information Science.

3.2 Population of the Study

The population of this study is 284 librarians. This consists of librarians in University libraries in all six states that make up the South-South geo-political zone of Nigeria. The figures were retrieved from the offices of the different University librarians in the University libraries in South-South Nigeria. The distribution of librarians in each University library in South-South Nigeria is presented in table 3.1.

Table 3.1 Population of the Study

| S/N | UNIVERSITIES | No. of Librarians |
|-----|---------------------|-------------------|
| 1 | University of Benin | 25 |

| | | |
|----|--|-----|
| 2 | University of Calabar | 35 |
| 3 | University of uyo | 25 |
| 4 | Federal university of petroleum resources, Effurun | 21 |
| 5 | Federal university, Otuoke | 10 |
| 6 | University of Port Harcourt | 31 |
| 7 | Akwabom State University of Technology, Uyo | 15 |
| 8 | Ambrose Alli University, Ekpoma | 13 |
| 9 | Cross River State University of Science &Technology, Calabar | 12 |
| 10 | Delta State University Abraka | 14 |
| 11 | River State University of Science and Technology | 9 |
| 12 | Edo university, Iyamho | 3 |
| 13 | Niger Delta University, Yenegoa | 13 |
| 14 | Igbinedion University Okada | 7 |
| 15 | Benson Idahosa University | 12 |
| 16 | Novena University, Ogume | 5 |
| 17 | Obong University, ObongNtak | 3 |
| 18 | Rhema University, Obeama-Asa – Rivers State | 5 |
| 19 | Samuel AdegboyegaUniversity,Ogwa. | 2 |
| 20 | Edwin Clark University, Ughelli | 5 |
| 21 | Micheal and CiciliaIbru University | 3 |
| 22 | Wellspring University, Evbuobanosa – Edo State | 3 |
| 23 | Western Delta University, Oghara | 8 |
| 24 | Ignatius Ajuru University of Education Library, Portharcourt | 5 |
| | TOTAL | 284 |

Sources:University librarians’ office of the twenty four university libraries under review (field report, 2016)

3.3 Sample and Sampling Technique

The sample size for this study is 284 respondents. This consists of all the librarians in university libraries in South-South, Nigeria.

The researcher adopted the complete enumerative sampling technique to investigate the entire 284librarians in the university libraries in South-South Nigeria. The entire population of this study was adoptedbecause the population is not large and the researcher had enough time and fund to conduct the study. This is in line with Osuala (2005) who opined that the entire population can be studied if the population is not large and when the researcher has enough time and fund to

conduct the study. Hence, the researcher adopted the entire population so as to obtain accurate data and desirable level of precision.

3.4 Research Instrument

The instrument used in this study for the collection of data is the questionnaire. A questionnaire entitled “awareness and use of social media for informal scientific communication among librarians in university libraries Questionnaire (AUSMISCLULQ)” was designed by the researcher. The instrument was divided into 6 different sections (A-F). Section A was designed to obtain background information from respondents and it contained four items. Section B measured librarians’ awareness and extent of awareness of the use of social media for informal scientific communication. Section C focused on the various social media tools used by librarians for informal scientific communication while section D examined the extent of the use of social media for informal scientific communication. Sections E and F were designed to elicit information on the channels of informal scientific communication used among librarians and the challenges faced by librarians in the use of social media for informal scientific communication respectively.

3.5 Validity of the Instrument

The instrument was designed by researcher and validated by the researcher’s supervisor and other experts from the Department of Library and Information Science and Measurement and Evaluation, both of Delta State University, Abraka. They were requested to study the items and assess the suitability of the language, the adequacy and relevance of the items in addressing the research questions bearing in mind the purpose of the study. The corrections,

comments and observations made were used to modify the final questionnaire used for the study. This ensured face and content validity of the instrument.

3.6 Reliability of the Instrument

To ensure the reliability of the instrument, the test-retest method of reliability was used to determine reliability. Moment Correlation Co-efficient r was used in analyzing the responses received from the librarians. A reliability co-efficient index of 0.74 was achieved and considered adequate for this study. A detailed computation of the result is presented in Appendix II.

3.7 Method of Data Collection

The questionnaire was self-administered by the researcher in order to ensure high rate of return and also to ensure that all respondents were given the opportunity to receive and complete the questionnaire. The services of three trained research assistants were also employed in administering the instrument to the respondents. This enabled the researcher to cover all the areas that were used for this study. A period of 6 weeks were used for the administration and completion of the questionnaire.

3.8 Method of Data Analysis

The data obtained from the administered copies of the questionnaire were analysed using both descriptive and inferential statistics. Frequency was used in analyzing the demographic data of the respondents. Frequency and statistical mean were also used to analyze the data and to answer the research questions. This is because of the descriptive nature of the data. Pearson Product Moment Correlation Coefficient r (PPMC) was used to test hypotheses 1 and 2 because the hypotheses sought to test for relationship between the two variables,

while multiple regression was used to test hypothesis 3 because the hypothesis sought to test for the relationship between multiple variables. All the statistical analyses were carried out using the Statistical Package for Social Science (SPSS Version 20).

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION OF RESULTS AND DISCUSSION OF FINDINGS

The chapter present the results and discussion of findings in line with the research questions asked and hypotheses formulated. This chapter is discussed under following subheadings:

- 4.1 Questionnaire response rate
- 4.2 Analysis of the respondents' bio-data
- 4.3 Answering of the research questions
- 4.4 Testing of the research hypotheses
- 4.5 Discussion of findings.

4.1: Questionnaire Response Rate

Data pertaining to the questionnaire response rate is presented in table 4.1

Table 4.1: Questionnaire Response Rate

| Number of Questionnaires Administered | Number of Questionnaires Returned | Percentage of Questionnaires Returned |
|---------------------------------------|-----------------------------------|---------------------------------------|
| 284 | 202 | 71% |

A total of 284 copies of the questionnaires were distributed and 202(71%) copies were retrieved and were found useful. The response rate of 71% is considered adequate for the study because the standard and acceptable response rate for most studies is 60% and above. This is also in line with Osuala (2005) who stated that “a minimum of 60% response rate is adequate for a research study” (p.49).

4.2: Analysis of the Respondents' Bio-data

The analysis of the respondents' bio-data are discussed in this section with respect to their gender, age, staff designation and work experience. The results are presented in table 4.2 to 4.5

Gender distribution of the Respondents

Table 4.2: Gender Distribution of the Respondents

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

Table 4.2 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 4.3: 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 4.3 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 4.4: 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 4.4 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 4.5: 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 4.6 shows that 66(32.7%) of the respondents had spent between 11-15 years on 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. This implies that many of the respondents in this study have good number of working experience.

4.3: Answering of the Research Questions

This section addressed issues pertaining to all the research questions asked.

Research Question One:To what extent are librarians in university libraries aware of the use of social media for informal scientific communication?

Data in Tables 4.6 and 4.7 provide answers to this question.

Awareness of the use of social media for informal scientific communication

Table 4.6: Librarians’ Awareness of the Use of Social Media for Informal Scientific Communication

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

Table 4.6 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 for informal scientific communication.

Extent of Librarians’ awareness of the use of social media for informal scientific communication

Table 4.7: Extent of Librarians’ Awareness of the 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 4.7 shows that the calculated mean for the extent of librarians' awareness of the 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 Two: What are the various social media tools used by librarians for informal scientific communication?

Data in Table 4.8 provides answer to this question.

Social media tools used by librarians' for informal scientific communication

Table 4.8: Social Media Tools Used by 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 4.7 shows that the calculated mean for the extent of librarians' awareness of the 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: To what extent do librarians in University libraries use social media for informal scientific communication?

Data in Tables 4.9 and 4.10 provide answers to this question.

Librarians' use of social media tools for informal scientific communication

Table 4.9: Librarians' Use of Social Media Tools for Informal Scientific Communication

| Librarians' use of social media tools for informal scientific communication | Frequency | Percentage (%) |
|--|------------------|-----------------------|
| Yes | 133 | 65.8 |
| No | 69 | 34.2 |
| Total | 202 | 100.0 |

From Table 4.9, it shows that a majority of the librarians 133(65.8%) agreed that they use social media for informal scientific communication while 69(34.2%) of them disagreed. This implies that librarians in University libraries in South-South Nigeria use social media for informal scientific communication.

Librarians’ extent of the use of social media tools for informal scientific communication

Table 4.10: Librarians’ extent of the use of social media tools for informal scientific communication

| Social media tools | Mean |
|--------------------------------|--------------|
| Facebook | 2.93 |
| WhatsApp | 2.42 |
| Twitter | 2.24 |
| Blogs | 2.20 |
| LinkedIn | 2.10 |
| Instagram | 2.02 |
| Skype | 1.68 |
| Flickr | 1.65 |
| YouTube | 1.92 |
| MySpace | 1.68 |
| Library Thing | 1.43 |
| lib.rario.us | 1.45 |
| Yammer | 2.21 |
| Aggregate Criterion | 1.94 2.50 |

Table 4.10 shows that the calculated mean of the extent of the use of social media tools for informal scientific communication by Librarians is 1.94. This is less than the criterion mean of 2.50. It can therefore be concluded that the librarians’ extent of the use of social media for informal scientific communication in university libraries in South-South, Nigeria is low, since the calculated mean is less than the criterion mean.

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

Data in Tables 4.11 and 4.12 provide answers to this question.

Channels of informal scientific communication used by librarians

Table 4.11: 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 4.11 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.

Librarians' extent of use of existing channels for informal scientific communication

Table 4.12: 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 4.12 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.

Research Question Five: What are the challenges faced by librarians in the use of social media for informal scientific communication?

Data in Table 4.13 provide answer to this question.

Challenges faced by librarians in the use of social media for informal scientific communication

Table 4.13: Challenges Faced By Librarians in the Use of Social Media for Informal Scientific Communication

| Challenges | Agree | | Disagree | |
|---|-------|------|----------|------|
| | No. | % | No. | % |
| I feel that the privacy of my personal information on social media is not protected. | 29 | 14.4 | 173 | 85.6 |
| I do not trust social media because it will use my personal information for other purposes. | 65 | 32.2 | 137 | 67.8 |
| I do not have enough skills to use social media. | 111 | 55.0 | 91 | 40 |
| I do not have enough time to use social media. | 102 | 50.5 | 100 | 49.5 |
| I do not use social media because of technical issues. | 118 | 58.4 | 84 | 41.6 |
| I do not feel confident enough to use social media. | 124 | 61.4 | 78 | 38.6 |
| I believe that some forms of social media require a lot of mental effort. | 111 | 55.0 | 91 | 45.0 |
| I think social media is not an easy tool to set up and maintain. | 94 | 46.5 | 108 | 53.5 |

From Table 4.13, it can be seen that 124 (representing 61.4%) of the total respondents have inadequate confidence to use social media, 118 (58.4%) face

technical issues associated with social media use, 111(55.0%) have inadequate skills to use social media and 111(55.0%) feelsome forms of social media require a lot of mental effort. Also, 102(50.5%) lack enough time to use social media. it can therefore be concluded that inadequate confidence to use social media, technical issues associated with social media use, inadequate skills to use social media, mental effort required for the use of social media and lack of enough time to use social media are the major challenges librarians encounter in the use of social media for informal scientific communication.

4.4: Testing of the Research Hypotheses

Hypothesis One: There is no significant relationship between awareness of the use of social media and informal scientific communication among librariansin

University libraries in South-South Nigeria. The result is shown in Table 4.14.

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

Table 4.14: Relationship between awareness of the use 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 |
| Informal Scientific Communication | N | 202 | 202 |
| | Pearson Correlation | .384** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 202 | 202 |

Table 4.14 shows 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 will lead to a corresponding increase in informal scientific communication and vice versa.

Hypothesis Two: There is no significant relationship between the use of social media and informal scientific communication among librarians in University libraries in South-South Nigeria. The result is shown in Table 4.15.

Relationship between the use of social media and informal scientific communication

Table 4.15: Relationship between the use of social media and informal scientific communication

| | | Use of social media | Informal Scientific Communication |
|-----------------------------------|---------------------|---------------------|-----------------------------------|
| Use of social media | Pearson Correlation | 1 | .503** |
| | Sig. (2-tailed) | | .000 |
| | N | 202 | 202 |
| Informal Scientific Communication | Pearson Correlation | .503** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 202 | 202 |

From Table 4.15, Pearson correlation coefficient $r (= 0.503)$. 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 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 use of social media by librarians may lead to a corresponding increase in informal scientific communication vice versa.

Hypothesis Three: There is no significant relationship between awareness, use of social media and informal scientific communication among librarians in University libraries in South-South Nigeria

The result is shown in Tables 4.16, 4.17 and 4.18 respectively.

Table 4.16: Model summary table of relationship between awareness of social media, use of social media and informal scientific communication

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .526 ^a | .277 | .270 | .55459 |

a. Predictors: (Constant), Awareness of social media, Use of social media

Table 4.17: ANOVA summary table of relationship between awareness of social media, use of social media and informal scientific communication

| Model | Sum of Squares | Df | Mean Square | F | Sig. |
|------------|----------------|-----|-------------|--------|-------------------|
| Regression | 23.434 | 2 | 11.717 | 38.095 | .000 ^b |
| Residual | 61.206 | 199 | .308 | | |
| Total | 84.640 | 201 | | | |

a. Dependent Variable: Informal Scientific Communication

b. Predictors: (Constant), Awareness of social media, use of social media

Table 4.18: Coefficient summary table of relationship between awareness of social media, use of social media and informal scientific communication

| Model | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. |
|---------------------------|-----------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | 2.115 | .125 | | 16.966 | .000 |
| Use of social media | .281 | .047 | .414 | 5.965 | .000 |
| Awareness of social media | .143 | .056 | .179 | 2.574 | .011 |

a. Dependent Variable: Informal scientific communication

From Tables 4.16, 4.17 and 4.18, the results of the regression indicated the two predictors (awareness and use of social media) explained 28% of the variance ($R^2=.277$, $F(2,199) = 38.085$, $p < 0.000$). Hence the null hypothesis is rejected. It was found that both awareness of social media and use of social media significantly predicted informal scientific communication among librarians. Awareness ($\beta=.179$, $p < .011$) while use of social media ($\beta=.414$, $p < .000$). With a 28% variance, it implies that there is a low relationship among the variables of interactions. The remaining 72% may mean that there may be other variables other than awareness and use of social media that may influence informal scientific communication among librarians in University libraries in South-South Nigeria.

4.5: Discussion of the Findings

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

Extent of librarians' awareness of the use of social media for informal scientific communication

The findings 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 the result of Wagner (2008) who 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. This is also in line with Bullas (2014) who opined that librarians are aware of social media usage and its ease of access which makes it possible for 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 of social media tools such as Facebook, WhatsApp, 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 (2005) whose finding of the awareness of social media use by information professionals revealed that most librarians in the developing countries are not aware of the impact and usefulness of social networking tools and services. However, the few that are aware are only aware of popular social media tools such as Facebook, WhatsApp, and twitter and they are still struggling to find out the productive uses of these sites for professional communication.

Various Social Media Tools Used By Librarians for Informal Scientific Communication

The study revealed that librarians in University libraries in South-South Nigeria use Facebook, WhatsApp, 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. These findings corroborates with Mohammed's (2015) assertion 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. These findings are also in agreement with Gruzd and Staves (2011) statement 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 WhatsApp are the most frequently used social media by librarians for informal scientific communication. This is in conformity with Hamid et al (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 to which librarians in University libraries use social media for informal scientific communication

The result from this study revealed that majority of librarians use social media for informal scientific communication. This finding conforms to Priem and Hemminger (2010) findings that many librarians have become active participants in the use of social media and predicted that librarians' use of social media would continue to increase. They further added that certain types of social media are more frequently used by librarians for the purposes of informal communication and exchange of information, such as blogs, micro-blogging sites, and wikis.

However, this finding contradicts the findings of Warnakula and Manickam (2010) which indicated that many librarians are still limited to the traditional uses of social media; for instance, most librarians use social media for making and maintaining connections with personal friends. Furthermore, Veletsianos et al (2013) noted in their study that the use of social networks and participation in social media for scientific purposes by librarians have not been fully explored and further emphasized libraries' relative lack of understanding of most social media as the cause.

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 (2010) and Allen (2013) whose

study revealed 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 (2007) who noted 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) observation 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).

Challenges faced by librarians in the use of social media for informal scientific communication.

The result on the challenges faced by librarians in the use of social media for informal scientific communication showed that the major challenges faced by librarians include inadequate confidence in the use of social media, technical issues related to social media, inadequate skills and mental effort required to use social media and lack of enough time to use social media. This finding contradicts Adeyemi (2012) and Agboola’s (2013) claim that the issue of epileptic power

supply in most African countries has in no small measure affected the use of social media applications by librarians as all the social media applications are powered by electricity. Furthermore, the study also disagree with Hutton (2008) who highlighted “privacy concern as a major challenge librarians face towards the use of social media, as he went further to note that social media poses increasingly online security risk because library users’ personal information on social media can be used by financial cronies.

However, the finding of this study is in agreement with those of Omolayole (2008) and Ezeani and Igwesi (2012) who identified online network problem or a cable network problem, connectivity or technical problem, lack of technical knowledge and expertise and lack of confidence in the use social media as major challenges faced by librarians in the use of social media for informal scientific communication.

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

The result revealed that 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 (2013) who observed that “librarians who are aware of the use of social media for informal scientific communication tend 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.

Relationship between use of social media and informal scientific communication

The outcome of this study has revealed that there is a significant relationship between the use of social media and informal scientific communication among librarians in University libraries in South-South Nigeria. The revelation implied that an increase in the use of social media by librarians may lead to a corresponding increase in informal scientific communication and vice versa. This finding disagrees with Warnakula and Manickam (2010) study which indicated that the use of social media does not affect informal scientific communication as many librarians are still limited to the use of other traditional channels of informal scientific communication and those who use social media limit themselves to the traditional uses of social media; for instance, most librarians use social media for making and maintaining connections with friends.

However, the revelation from this study agrees with the result of the studies conducted by Zuccala (2004) and Urista, Dong, and Day, (2009). Their studies revealed that the use of social media by different library groups have greatly influenced informal scientific communication to the extent of bringing into existence different invisible colleges which enable librarians to interact and communicate informally. Also Urista, Dong, and Day, (2009) further noted that

“it seems that invisible colleges in various library associations prefer to use modern communication channels such as social media for informal scientific communication”

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

This study reveals that both awareness of social media and use of social media significantly predicted of significance is low. This may be because other variables can influence informal scientific communication among librarians in university libraries in South-South Nigeria. This finding is in agreement with Popoola’s (2014) assertion 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 among librarians.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter focuses on the summary of the study, conclusion, recommendations and contribution to knowledge.

5.1 Summary of the Study

The study explored awareness and use of social media for informal scientific communication among librarians in University libraries in South-South Nigeria. The study covered all University libraries in South-South Nigeria. The purpose of the study was to investigate the extent of librarians' awareness and use of social media for informal scientific communication, the various social media tool used by librarians, the challenges faced by librarians in the use of social media for informal scientific communication, as well as the relationship between awareness of the use of social media and informal scientific communication, use of social media and informal scientific communication. The review of the related literature was based on the research questions formulated. Two hundred and eighty four (284) copies of questionnaires were distributed to the respondents and two hundred and two (202) questionnaires were retrieved and found usable. The summary of the research findings are as follows:

1. Librarians in University libraries in South-South Nigeria are aware of the use of social media for informal scientific communication. Although,

their extent of awareness of the use of the various social media tools for informal scientific communication is low.

2. The various social media tools used by librarians for informal scientific communication include Facebook, WhatsApp, Google+, twitter and YouTube.

3. The extent to which librarians in University libraries use social media for informal scientific communication is low.

4. The informal scientific communication channels usually used by librarians in

University libraries include face-to-face contact with professional colleagues,

lectures and seminars, Letters, pre-prints, and telephone calls.

5. Inadequate confidence in the use of social media, technical issues related to social media, inadequate skills and mental effort required to use social media and lack of enough time to use social media are the major challenges faced by librarians in the use of social media for informal scientific communication.

6. There exist a significant relationship between awareness of the use of social media and informal scientific communication, as 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.

7. There exist a significant relationship between the use of social media and informal scientific communication, as an increase in the use of social media by librarians may lead to a corresponding increase in informal scientific communication and vice versa.
8. There exist a significant relationship between awareness, use of social media and informal scientific communication.

5.2 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 to 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 majorly use Facebook and WhatsApp 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.

5.3 Recommendations

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

1. University Librarians and other library administrators should sensitize library staff on the use of different social media tools for informal scientific communication because the world is now a global village and there is need for scholarly communication among library professionals irrespective of their geographical location.
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 invisible 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 institution management should also support staff towards this direction.

5.4 Contributions to Knowledge

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

1. The study has filled the gap in research in the area of librarians' awareness and use of social media for informal scientific communication in University libraries in South-South, Nigeria.
2. The study has been able to establish the extent of librarians' awareness and use of social media for informal scientific communication in University libraries in South-South Nigeria.
3. The study has filled some gaps in the field of library and information science about social media use, informal communication channels and

scientific communication. This study makes a significant theoretical contribution to knowledge in this area by addressing both of these information gaps and collecting information on the use of social media for informal scientific communication among librarians in University libraries in South-South Nigeria.

4. The study has shown unequivocally that there is a correlation between awareness, use of social media and informal scientific communication among librarians in University library in South-South Nigeria.
5. The study has successfully increased Librarians' knowledge on a relatively new channel of informal scientific communication (social media) for the purposes of scientific communication.

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APPENDIX I: QUESTIONNAIRE

Department of Library and Inform.
Sci.,

Faculty of Education,
Delta State University,
Abraka - Delta State.

10th January, 2017.

Dear Respondent,

**Awareness and Use of Social Media for Informal Scientific Communication
among Librarians Questionnaire (AUSMISCLQ)**

I am a post graduate student of the Department of Library and Information Science, Delta State University, Abraka. I am carrying out a research on “awareness and use of social media for informal scientific communication among librarians in university libraries in South-South Nigeria”.

I humbly request your assistance in this study by responding accordingly to the questions in this questionnaire. Your responses will be used strictly for research purposes.

Thank you for your anticipated cooperation.

Yours Faithfully,

OkuonghaeOmorodion

SECTION A: BIODATA

Instruction: please tick [] where appropriate

4. Gender: Male [] Female []
5. Age: 20-30years [] 31-40years [] 41-50years [] 51-60years [] 61 years and Above []
6. Staff Designation: Assistant Librarian [] Librarian II [] Librarian I [] Senior Librarian [] Principal Librarian [] Deputy University Librarian [] University Librarian []
7. Working Experience: 1-5years [] 6-10 years [] 11-15years [] 16-20 years [] 21-25years [] 26-30years [] 31years and above []

**SECTION B: AWARENESS IN THE USE OF SOCIAL MEDIA FOR
INFORMAL SCIENTIFIC COMMUNICATION**

8. Are you aware of the use of social media for informal scientific communication?

YES [] NO []

9. If yes, to what extent are you aware of the use of the following social media tools for informal scientific communication?

| Social Media Tools | Very high Extent | High Extent | Low Extent | Very Low Extent |
|--------------------|------------------|-------------|------------|-----------------|
| Facebook | | | | |
| Twitter | | | | |
| Blogs | | | | |
| LinkedIn | | | | |
| Instagram | | | | |
| Skype | | | | |
| Flickr | | | | |
| Google+ | | | | |
| MySpace | | | | |
| LibraryThing | | | | |
| lib.rario.us | | | | |
| Yammer | | | | |
| Second Life | | | | |
| Youtube | | | | |

S

SECTION C: VARIOUS SOCIAL MEDIA TOOLS USED BY LIBRARIANS FOR INFORMAL SCIENTIFIC COMMUNICATION

10. Which of the following social media tools do you use for informal scientific communication?

| Social Media Tools | Responses |
|---------------------|-----------|
| Facebook | |
| Twitter | |
| Blogs | |
| Instagram | |
| LinkedIn | |
| Skype | |
| YouTube | |
| Flickr | |
| Google ⁺ | |
| MySpace | |
| Second Life | |
| Yammer | |
| LibraryThing | |
| lib.rario.us | |

SECTION D: EXTENT OF USE SOCIAL MEDIA IN INFORMAL SCIENTIFIC COMMUNICATION

11. Do you use social media tools for informal scientific communication among professional colleagues? YES [] NO []
12. If yes, to what extent do you use the following social media tools for informal scientific communication?

| Social Media Tools | Very high Extent | High Extent | Low Extent | Very Low Extent |
|--------------------|------------------|-------------|------------|-----------------|
| Facebook | | | | |
| Twitter | | | | |
| Blogs | | | | |
| LinkedIn | | | | |
| Instagram | | | | |
| Skype | | | | |
| Flickr | | | | |
| MySpace | | | | |
| LibraryThing | | | | |
| lib.rario.us | | | | |
| Yammer | | | | |
| Second Life | | | | |
| Youtube | | | | |

SECTION E: CHANNELS OF INFORMAL SCIENTIFIC COMMUNICATION USED AMONG LIBRARIANS

13. The following are channels of informal scientific communication used by librarians

| STATEMENT | Agree | Disagree |
|-----------------------|-------|----------|
| face-to-face contact | | |
| Letters | | |
| pre-prints | | |
| Lectures and seminars | | |

| | | |
|-----------------|--|--|
| reviewer notes | | |
| telephone calls | | |
| post-prints | | |

14. To what extent do librarians use the above mentioned channels of informal scientific communication for informal scholarly communication?

| STATEMENT | Very High Extent | High Extent | Low Extent | Very Low Extent |
|-----------------------|------------------|-------------|------------|-----------------|
| face-to-face contact | | | | |
| Letters | | | | |
| pre-prints | | | | |
| Lectures and seminars | | | | |
| reviewer notes | | | | |
| telephone calls | | | | |
| post-prints | | | | |

SECTION F: CHALLENGES FACED BY LIBRARIANS IN THE USE OF SOCIAL MEDIA IN INFORMAL SCIENTIFIC COMMUNICATION

15. The following are some of the challenges faced by librarians in the use of social media for informal scientific communication

| STATEMENT | Agree | Disagree |
|---|-------|----------|
| I feel that the privacy of my personal information on social media is not protected. | | |
| I do not trust social media because it will use my personal information for other purposes. | | |
| I do not have enough skills to use social media. | | |
| I do not have enough time to use social media. | | |

| | | |
|---|--|--|
| I do not use social media because of technical issues. | | |
| I do not feel confident enough to use social media. | | |
| I believe that some forms of social media require a lot of mental effort. | | |
| I think social media is not an easy tool to set up and maintain. | | |

APPENDIX II

DETAILED COMPUTATION OF COEFFICIENT OF RELIABILITY (USING PEARSONS PRODUCTS MOMENT CORRELATION COEFFICIENT r)

Correlations

| | FIRST ADMINISTRATION | SECOND ADMINISTRATION |
|--|----------------------|-----------------------|
| Pearson Correlation | 1 | .889** |
| FIRST Sig. (2-tailed) ADMINISTRATION | | .007 |
| N | 20 | 20 |
| Pearson Correlation | .889** | 1 |
| SECOND Sig. (2tailed) ADMINISTRATION | .007 | |
| N | 20 | 20 |

** . Correlation is significant at the 0.01 level (2-tailed).

**APPENDIX III
DETAILED SPSS OUTPUT**

FREQUENCIES VARIABLES=VAR00001 VAR00002 VAR00003 VAR00004 VAR00005
/NTILES=4
/ORDER=ANALYSIS.
Frequencies
Notes

| | | |
|------------------------|--------------------------------|--|
| Output Created | | 09-FEB-2017 16:23:27 |
| Comments | | |
| | Data | C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav |
| Input | Active Dataset | DataSet1 |
| | Filter | <none> |
| | Weight | <none> |
| | Split File | <none> |
| | N of Rows in Working Data File | 202 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| | Cases Used | Statistics are based on all cases with valid data. |
| Syntax | | FREQUENCIES VARIABLES=VAR00001 VAR00002 VAR00003 VAR00004 VAR00005 /NTILES=4 /ORDER=ANALYSIS. |
| Resources | Processor Time | 00:00:00.02 |
| | Elapsed Time | 00:00:00.02 |

[DataSet1] C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav
Statistics

| | | Gender | Age | Staff Designation | Working Experience | Awareness of social media for informal scientific communication |
|-------------|---------|--------|------|-------------------|--------------------|---|
| N | Valid | 202 | 202 | 202 | 202 | 202 |
| | Missing | 0 | 0 | 0 | 0 | 0 |
| Percentiles | 25 | 1.00 | 2.00 | 1.00 | 2.00 | 1.00 |
| | 50 | 2.00 | 2.50 | 2.00 | 3.00 | 1.00 |
| | 75 | 2.00 | 3.00 | 4.00 | 3.00 | 1.00 |

Frequency Table
Gender

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|--------------|-----------|---------|---------------|--------------------|
| Valid Male | 94 | 46.5 | 46.5 | 46.5 |
| Valid Female | 108 | 53.5 | 53.5 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

Age

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|--------------------------|-----------|---------|---------------|--------------------|
| Valid 20-30 years | 14 | 6.9 | 6.9 | 6.9 |
| Valid 31-40 years | 87 | 43.1 | 43.1 | 50.0 |
| Valid 41-50 years | 81 | 40.1 | 40.1 | 90.1 |
| Valid 51-60 years | 16 | 7.9 | 7.9 | 98.0 |
| Valid 61 years and above | 4 | 2.0 | 2.0 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

Staff Designation

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|-----------------------------------|-----------|---------|---------------|--------------------|
| Valid Assistant Librarian | 58 | 28.7 | 28.7 | 28.7 |
| Valid Librarian II | 51 | 25.2 | 25.2 | 54.0 |
| Valid Librarian I | 39 | 19.3 | 19.3 | 73.3 |
| Valid Senior Librarian | 29 | 14.4 | 14.4 | 87.6 |
| Valid Principal Librarian | 15 | 7.4 | 7.4 | 95.0 |
| Valid Deputy University Librarian | 6 | 3.0 | 3.0 | 98.0 |
| Valid University Librarian | 4 | 2.0 | 2.0 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

Working Experience

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|--------------------------|-----------|---------|---------------|--------------------|
| Valid 1-5 years | 39 | 19.3 | 19.3 | 19.3 |
| Valid 6-10 years | 49 | 24.3 | 24.3 | 43.6 |
| Valid 11-15 years | 66 | 32.7 | 32.7 | 76.2 |
| Valid 16=20 years | 23 | 11.4 | 11.4 | 87.6 |
| Valid 21-25 years | 11 | 5.4 | 5.4 | 93.1 |
| Valid 26-30 years | 6 | 3.0 | 3.0 | 96.0 |
| Valid 31 years and above | 8 | 4.0 | 4.0 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

Awareness of social media for informal scientific communication

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|--|-----------|---------|---------------|--------------------|
|--|-----------|---------|---------------|--------------------|

| | | | | | |
|-------|-------|-----|-------|-------|-------|
| | Yes | 186 | 92.1 | 92.1 | 92.1 |
| Valid | No | 16 | 7.9 | 7.9 | 100.0 |
| | Total | 202 | 100.0 | 100.0 | |

DESCRIPTIVES VARIABLES=VAR00006 VAR00007 VAR00008 VAR00009 VAR00010 VAR00011
VAR00012 VAR00013 VAR00014 VAR00015 VAR00016 VAR00017 VAR00018 VAR00019
VAR00020
/STATISTICS=MEAN STDDEV.

Descriptives

Notes

| | | |
|------------------------|--|---|
| Output Created | 09-FEB-2017 16:23:59 | |
| Comments | C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav | |
| Input | Data | DataSet1 |
| | Active Dataset | <none> |
| | Filter | <none> |
| | Weight | <none> |
| | Split File | <none> |
| | N of Rows in Working Data File | 202 |
| Missing Value Handling | Definition of Missing | User defined missing values are treated as missing. |
| | Cases Used | All non-missing data are used. |
| Syntax | DESCRIPTIVES VARIABLES=VAR00006 VAR00007 VAR00008 VAR00009 VAR00010 VAR00011 VAR00012 VAR00013 VAR00014 VAR00015 VAR00016 VAR00017 VAR00018 VAR00019 VAR00020 /STATISTICS=MEAN STDDEV. | |
| Resources | Processor Time | 00:00:00.02 |
| | Elapsed Time | 00:00:00.02 |

[DataSet1] C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav

Descriptive Statistics

| | N | Mean | Std. Deviation |
|--|---|------|----------------|
|--|---|------|----------------|

| | | | |
|--------------------|-----|--------|---------|
| 6(1) | 202 | 3.3069 | .86666 |
| 6(2) | 199 | 2.8191 | 1.10437 |
| 6(3) | 195 | 2.5846 | .99833 |
| 6(4) | 196 | 2.5510 | 1.04388 |
| 6(5) | 194 | 2.7062 | 3.16903 |
| 6(6) | 192 | 2.3125 | 1.05168 |
| 6(7) | 187 | 1.8449 | .93470 |
| 6(8) | 199 | 2.7337 | 1.19105 |
| 6(9) | 188 | 2.1117 | .98831 |
| 6(10) | 188 | 2.2074 | 1.19022 |
| 6(11) | 187 | 1.8930 | .97788 |
| 6(12) | 185 | 1.6324 | .84379 |
| 6(13) | 185 | 1.5784 | .84414 |
| 6(14) | 194 | 2.7371 | 1.15528 |
| 6(Aggregate) | 202 | 2.3990 | .81135 |
| Valid N (listwise) | 174 | | |

7.

| Channels of Informal Scientific Communication | | | |
|---|-----|-----|--|
| 1 | 162 | 80% | |
| 2 | 115 | 60% | |
| 3 | 92 | 46% | |
| 4 | 69 | 34% | |
| 5 | 82 | 41% | |
| 6 | 76 | 38% | |
| 7 | 99 | 49% | |
| 8 | 36 | 18% | |
| 9 | 104 | 51% | |
| 10 | 40 | 20% | |
| 11 | 25 | 12% | |
| 12 | 13 | 6% | |
| 13 | 43 | 21% | |
| 14 | 28 | 14% | |

FREQUENCIES VARIABLES=VAR00021
 /NTILES=4
 /ORDER=ANALYSIS.

Frequencies
 Notes

| | |
|----------------|----------------------|
| Output Created | 09-FEB-2017 16:24:45 |
|----------------|----------------------|

| | | |
|------------------------|--------------------------------|---|
| Comments | | C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav |
| Input | Data | |
| | Active Dataset | DataSet1 |
| | Filter | <none> |
| | Weight | <none> |
| | Split File | <none> |
| | N of Rows in Working Data File | 202 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| | Cases Used | Statistics are based on all cases with valid data. |
| Syntax | | FREQUENCIES VARIABLES=VAR00021 /NTILES=4 /ORDER=ANALYSIS. |
| Resources | Processor Time | 00:00:00.02 |
| | Elapsed Time | 00:00:00.02 |

[DataSet1] C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav

Statistics

Do you se social media for informal...?

| | | |
|-------------|---------|------|
| N | Valid | 202 |
| | Missing | 0 |
| Percentiles | 25 | 1.00 |
| | 50 | 1.00 |
| | 75 | 2.00 |

Do you use social media for informal...?

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|-----------|-----------|---------|---------------|--------------------|
| Valid Yes | 133 | 65.8 | 65.8 | 65.8 |
| Valid No | 69 | 34.2 | 34.2 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

DESCRIPTIVES VARIABLES=VAR00022 VAR00023 VAR00024 VAR00025 VAR00026 VAR00027
VAR00028 VAR00029 VAR00030 VAR00031 VAR00032 VAR00033 VAR00034 VAR00035
/STATISTICS=MEAN STDDEV.

Descriptive

Notes

| | | |
|------------------------|--------------------------------|---|
| Output Created | | 09-FEB-2017 16:25:22 |
| Comments | | |
| | Data | C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav |
| Input | Active Dataset | DataSet1 |
| | Filter | <none> |
| | Weight | <none> |
| | Split File | <none> |
| | N of Rows in Working Data File | 202 |
| Missing Value Handling | Definition of Missing | User defined missing values are treated as missing. |
| | Cases Used | All non-missing data are used. |
| Syntax | | DESCRIPTIVES VARIABLES=VAR00022 VAR00023 VAR00024 VAR00025 VAR00026 VAR00027 VAR00028 VAR00029 VAR00030 VAR00031 VAR00032 VAR00033 VAR00034 VAR00035 /STATISTICS=MEAN STDDEV. |
| Resources | Processor Time | 00:00:00.02 |
| | Elapsed Time | 00:00:00.02 |

[DataSet1] C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav

Descriptive Statistics

| | N | Mean | Std. Deviation |
|------|-----|--------|----------------|
| 9(1) | 186 | 2.9301 | 1.02428 |
| 9(2) | 178 | 2.4157 | 1.07681 |
| 9(3) | 175 | 2.2400 | 1.10879 |
| 9(4) | 174 | 2.2011 | 1.10165 |

| | | | |
|--------------------|-----|--------|---------|
| 9(5) | 172 | 2.1047 | 1.07637 |
| 9(6) | 174 | 2.0172 | 1.08310 |
| 9(7) | 163 | 1.6810 | .92766 |
| 9(8) | 163 | 1.6503 | .89259 |
| 9(9) | 170 | 1.9235 | 1.10942 |
| 9(10) | 160 | 1.6813 | .96721 |
| 9(11) | 157 | 1.4331 | .73619 |
| 9(12) | 163 | 1.4479 | .72140 |
| 9(13) | 179 | 2.2123 | 1.18969 |
| 9(Aggregate) | 202 | 1.9377 | .95533 |
| Valid N (listwise) | 143 | | |

DESCRIPTIVES VARIABLES=VAR00044 VAR00045 VAR00046 VAR00047 VAR00048 VAR00049
VAR00050 VAR00051
/STATISTICS=MEAN STDDEV.

Descriptives
Notes

| | |
|----------------|----------------------|
| Output Created | 09-FEB-2017 16:26:18 |
| Comments | |

| | | |
|------------------------|--------------------------------|--|
| | Data | C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav |
| Input | Active Dataset | DataSet1 |
| | Filter | <none> |
| | Weight | <none> |
| | Split File | <none> |
| | N of Rows in Working Data File | 202 |
| Missing Value Handling | Definition of Missing | User defined missing values are treated as missing. |
| | Cases Used | All non-missing data are used. |
| Syntax | | DESCRIPTIVES VARIABLES=VAR00044 VAR00045 VAR00046 VAR00047 VAR00048 VAR00049 VAR00050 VAR00051 /STATISTICS=MEAN STDDEV. |
| Resources | Processor Time | 00:00:00.02 |
| | Elapsed Time | 00:00:00.02 |

[DataSet1] C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav

Descriptive Statistics

| | N | Mean | Std. Deviation |
|--------------------|-----|--------|----------------|
| 11(1) | 198 | 3.7525 | .50818 |
| 11(2) | 200 | 3.2750 | .70844 |
| 11(3) | 182 | 2.3462 | 1.09543 |
| 11(4) | 199 | 3.3920 | .72970 |
| 11(5) | 188 | 2.4255 | 1.10409 |
| 11(6) | 199 | 3.4975 | .73081 |
| 11(7) | 187 | 2.2995 | 1.10529 |
| 11(Aggregate) | 202 | 3.0030 | .64892 |
| Valid N (listwise) | 178 | | |

FREQUENCIES VARIABLES=VAR00052 VAR00053 VAR00054 VAR00055 VAR00056 VAR00057
VAR00058 VAR00059
/NTILES=4
/ORDER=ANALYSIS.

Frequencies
Notes

| | | |
|------------------------|--------------------------------|---|
| Output Created | | 09-FEB-2017 16:26:47 |
| Comments | | |
| | Data | C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav |
| Input | Active Dataset | DataSet1 |
| | Filter | <none> |
| | Weight | <none> |
| | Split File | <none> |
| | N of Rows in Working Data File | 202 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| | Cases Used | Statistics are based on all cases with valid data. |
| Syntax | | FREQUENCIES VARIABLES=VAR00052 VAR00053 VAR00054 VAR00055 VAR00056 VAR00057 VAR00058 VAR00059 /NTILES=4 /ORDER=ANALYSIS. |
| Resources | Processor Time | 00:00:00.00 |
| | Elapsed Time | 00:00:00.01 |

[DataSet1] C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav

Statistics

| | | 12(1) | 12(2) | 12(3) | 12(4) | 12(5) | 12(6) | 12(7) |
|-------------|---------|-------|-------|-------|-------|-------|-------|-------|
| N | Valid | 202 | 202 | 202 | 202 | 202 | 202 | 202 |
| | Missing | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Percentiles | 25 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | 50 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | 75 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |

Statistics

| | | 12(8) |
|-------------|---------|-------|
| N | Valid | 202 |
| | Missing | 0 |
| Percentiles | 25 | 1.00 |
| | 50 | 2.00 |

Frequency Table

12(1)

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| Valid Agree | 29 | 14.4 | 14.4 | 14.4 |
| Valid Disagree | 173 | 85.6 | 85.6 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

12(2)

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| Valid Agree | 65 | 32.2 | 32.2 | 32.2 |
| Valid Disagree | 137 | 67.8 | 67.8 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

12(3)

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| Valid Agree | 111 | 55.0 | 55.0 | 55.0 |
| Valid Disagree | 91 | 45.0 | 45.0 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

12(4)

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| Valid Agree | 102 | 50.5 | 50.5 | 50.5 |
| Valid Disagree | 100 | 49.5 | 49.5 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

12(5)

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| Valid Agree | 118 | 58.4 | 58.4 | 58.4 |
| Valid Disagree | 84 | 41.6 | 41.6 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

12(6)

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| Valid Agree | 124 | 61.4 | 61.4 | 61.4 |
| Valid Disagree | 78 | 38.6 | 38.6 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

12(7)

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| Valid Agree | 111 | 55.0 | 55.0 | 55.0 |
| Valid Disagree | 91 | 45.0 | 45.0 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

12(8)

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| Valid Agree | 94 | 46.5 | 46.5 | 46.5 |
| Valid Disagree | 108 | 53.5 | 53.5 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

FREQUENCIES VARIABLES=VAR00036 VAR00037 VAR00038 VAR00039 VAR00040 VAR00041
 VAR00042
 /NTILES=4
 /ORDER=ANALYSIS.

Frequencies
 Notes

| | |
|----------------|---|
| Output Created | 09-FEB-2017 16:35:37 |
| Comments | |
| Input | Data |
| | C:\Users\QUEEN FRANCISCA- O\Documents\SPSS RESULTS\OmorodionData .sav |

| | | |
|------------------------|--------------------------------|---|
| | Active Dataset | DataSet1 |
| | Filter | <none> |
| | Weight | <none> |
| | Split File | <none> |
| | N of Rows in Working Data File | 202 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| | Cases Used | Statistics are based on all cases with valid data. |
| Syntax | | FREQUENCIES VARIABLES=VAR00036 VAR00037 VAR00038 VAR00039 VAR00040 VAR00041 VAR00042 /NTILES=4 /ORDER=ANALYSIS. |
| Resources | Processor Time | 00:00:00.00 |
| | Elapsed Time | 00:00:00.02 |

[DataSet1] C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav

Statistics

| | | 10(1) | 10(2) | 10(3) | 10(4) | 10(5) | 10(6) | 10(7) |
|-------------|---------|-------|-------|-------|-------|-------|-------|-------|
| N | Valid | 202 | 202 | 202 | 202 | 202 | 202 | 202 |
| | Missing | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Percentiles | 25 | 2.00 | 2.00 | 1.00 | 2.00 | 1.00 | 2.00 | 1.00 |
| | 50 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| | 75 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |

Frequency Table

10(1)

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|----------|-----------|---------|---------------|--------------------|
| Valid | Agree | 5 | 2.5 | 2.5 | 2.5 |
| | Disagree | 197 | 97.5 | 97.5 | 100.0 |
| | Total | 202 | 100.0 | 100.0 | |

10(2)

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| Valid Agree | 24 | 11.9 | 11.9 | 11.9 |
| Valid Disagree | 178 | 88.1 | 88.1 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

10(3)

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| Valid Agree | 64 | 31.7 | 31.7 | 31.7 |
| Valid Disagree | 138 | 68.3 | 68.3 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

10(4)

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| Valid Agree | 21 | 10.4 | 10.4 | 10.4 |
| Valid Disagree | 181 | 89.6 | 89.6 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

10(5)

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| Valid Agree | 60 | 29.7 | 29.7 | 29.7 |
| Valid Disagree | 142 | 70.3 | 70.3 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

10(6)

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| Valid Agree | 20 | 9.9 | 9.9 | 9.9 |
| Valid Disagree | 182 | 90.1 | 90.1 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

10(7)

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| Valid Agree | 64 | 31.7 | 31.7 | 31.7 |
| Valid Disagree | 138 | 68.3 | 68.3 | 100.0 |
| Total | 202 | 100.0 | 100.0 | |

GET

FILE='C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav'.

DATASET NAME DataSet1 WINDOW=FRONT.

CORRELATIONS

/VARIABLES=VAR00020 VAR00051

/PRINT=TWOTAIL NOSIG
 /MISSING=PAIRWISE.

Correlations
 Notes

| | | |
|------------------------|--------------------------------|---|
| Output Created | 10-FEB-2017 22:31:14 | |
| Comments | | |
| | Data | C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav |
| Input | Active Dataset | DataSet1 |
| | Filter | <none> |
| | Weight | <none> |
| | Split File | <none> |
| | N of Rows in Working Data File | 202 |
| | Definition of Missing | User-defined missing values are treated as missing. |
| Missing Value Handling | Cases Used | Statistics for each pair of variables are based on all the cases with valid data for that pair. |
| | | CORRELATIONS |
| Syntax | | /VARIABLES=VAR00020 VAR00051 /PRINT=TWOTAIL NOSIG /MISSING=PAIRWISE. |
| Resources | Processor Time | 00:00:00.02 |
| | Elapsed Time | 00:00:00.03 |

[DataSet1] C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav

Correlations

| | | 6(Aggregate) | 11(Aggregate) |
|---------------|---------------------|--------------|---------------|
| 6(Aggregate) | Pearson Correlation | 1 | .384** |
| | Sig. (2-tailed) | | .000 |
| | N | 202 | 202 |
| 11(Aggregate) | Pearson Correlation | .384** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 202 | 202 |

** . Correlation is significant at the 0.01 level (2-tailed).

Notes

| | |
|----------------|----------------------|
| Output Created | 10-FEB-2017 22:51:01 |
|----------------|----------------------|

| | | |
|------------------------|-----------------------------------|--|
| Comments | | C:\Users\QUEEN FRANCISCA- O\Documents\SPSS RESULTS\OmorodionData |
| | Data | .sav |
| Input | Active Dataset | DataSet1 |
| | Filter | <none> |
| | Weight | <none> |
| | Split File | <none> |
| | N of Rows in Working Data File | 202 |
| | Definition of Missing | User-defined missing values are treated as missing. |
| Missing Value Handling | Cases Used | Statistics for each pair of variables are based on all the cases with valid data for that pair. |
| | | CORRELATIONS |
| Syntax | | /VARIABLES=VAR00051 VAR00035 /PRINT=TWOTAIL NOSIG /MISSING=PAIRWISE. |
| Resources | Processor Time | 00:00:00.02 |
| | Elapsed Time | 00:00:00.03 |

Correlations
Notes

| | | |
|----------------|-----------------------------------|---|
| Output Created | | 10-FEB-2017 22:52:52 |
| Comments | | C:\Users\QUEEN FRANCISCA- O\Documents\SPSS RESULTS\OmorodionData |
| | Data | .sav |
| Input | Active Dataset | DataSet1 |
| | Filter | <none> |
| | Weight | <none> |
| | Split File | <none> |
| | N of Rows in Working Data File | 202 |

| | | |
|------------------------|-----------------------|--|
| | Definition of Missing | User-defined missing values are treated as missing. |
| Missing Value Handling | Cases Used | Statistics for each pair of variables are based on all the cases with valid data for that pair. |
| Syntax | | CORRELATIONS /VARIABLES=VAR00035 VAR00051 /PRINT=TWOTAIL NOSIG /MISSING=PAIRWISE. |
| Resources | Processor Time | 00:00:00.03 |
| | Elapsed Time | 00:00:00.05 |

[DataSet1] C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav

Correlations

| | | 9(Aggregate) | 11(Aggregate) |
|---------------|---------------------|--------------|---------------|
| 9(Aggregate) | Pearson Correlation | 1 | .503** |
| | Sig. (2-tailed) | | .000 |
| | N | 202 | 202 |
| 11(Aggregate) | Pearson Correlation | .503** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 202 | 202 |

** . Correlation is significant at the 0.01 level (2-tailed).

REGRESSION

```

/MISSING LISTWISE
/STATISTICS COEFF OUTS R ANOVA
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT VAR00051
/METHOD=ENTER VAR00035 VAR00020.

```

Regression

Notes

| | |
|----------------|---|
| Output Created | 10-FEB-2017 23:00:02 |
| Comments | |
| Input | Data |
| | C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav |

| | | |
|------------------------|---|---|
| | Active Dataset | DataSet1 |
| | Filter | <none> |
| | Weight | <none> |
| | Split File | <none> |
| | N of Rows in Working Data File | 202 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| | Cases Used | Statistics are based on cases with no missing values for any variable used. |
| Syntax | | REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT VAR00051 /METHOD=ENTER VAR00035 VAR00020. |
| Resources | Processor Time | 00:00:00.06 |
| | Elapsed Time | 00:00:00.06 |
| | Memory Required | 2732 bytes |
| | Additional Memory Required for Residual Plots | 0 bytes |

[DataSet1] C:\Users\QUEEN FRANCISCA-O\Documents\SPSS RESULTS\OmorodionData.sav

Variables Entered/Removed^a

| Model | Variables Entered | Variables Removed | Method |
|-------|--|-------------------|--------|
| 1 | 6(Aggregate), 9(Aggregate) ^b | . | Enter |

a. Dependent Variable: 11(Aggregate)

b. All requested variables entered.

Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .526 ^a | .277 | .270 | .55459 |

a. Predictors: (Constant), 6(Aggregate), 9(Aggregate)

ANOVA^a

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|-----|-------------|--------|-------------------|
| 1 | Regression | 23.434 | 2 | 11.717 | 38.095 | .000 ^b |
| | Residual | 61.206 | 199 | .308 | | |
| | Total | 84.640 | 201 | | | |

a. Dependent Variable: 11(Aggregate)

b. Predictors: (Constant), 6(Aggregate), 9(Aggregate)

Coefficients^a

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|-------|--------------|-----------------------------|------------|---------------------------|--------|------|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 2.115 | .125 | | 16.966 | .000 |
| | 9(Aggregate) | .281 | .047 | .414 | 5.965 | .000 |
| | 6(Aggregate) | .143 | .056 | .179 | 2.574 | .011 |

a. Dependent Variable: 11(Aggregate)