

UNIVERSITY OF GHANA, LEGON
DEPARTMENT OF INFORMATION STUDIES

DIGITAL REFERENCE SERVICE IN ACADEMIC LIBRARIES: A STUDY OF
SELECTED ACADEMIC LIBRARIES IN GHANA



THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN
PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF MPhil
INFORMATION STUDIES DEGREE.

JULY, 2018

DECLARATION

I hereby declare that this thesis is the result of my own original research and that all sources I have used or quoted is acknowledged by means of references. No part of it has been presented for another degree in this University or elsewhere without any acknowledgement.

.....
Name: Naomi Amofah-Serwaa

.....
Date

Supervisors

.....
Prof Perpetua S. Dadzie

.....
Prof. Edwin E. Badu

.....
Date

.....
Date

DEDICATION

I dedicate this work to my late father Mr. John Kwaku Amofah

ACKNOWLEDGMENTS

I give all the glory to God the Most High for his guidance and protection throughout this programme of study. In fact, nothing important could have been done without His divine protection.

I wish to express my profound gratitude to Prof. Perpetua S. Dadzie and Prof Edwin E. Badu for their supervision.

I wish to express my indebtedness to Rev. Kwaku Owusu Poku. From the bottom of my heart, I say thank you.

I acknowledge Dr Samuel Niikoi and Dr Christopher Owusu-Ansah for their immense contribution to this work.

I appreciate Pastor Dr. Moses Sam, Rev Henry Kofi Yeboah, and Rev. Revival Wiredu and Pastor Gordon Ed-Abraham who supported me spiritually.

I also thank Mr Joseph Nsiah, Mrs Phyllis Asorh Oteng, Mr Roger Adu-Tieku and Mr Solomon Yawson for his encouragement and support.

Furthermore, I wish to express my appreciation to all those who participated in the research process. Those who agreed to be interviewed and those who completed and returned the questionnaire. But for their cooperation, this research would not have been possible.

My sincere gratitude goes to all the lecturers at the Department of Information Studies, advice and encouragement during my studies.

TABLE OF CONTENT

DECLARATION	i
DEDICATION	iii
ACKNOWLEDGMENTS	iv
TABLE OF CONTENT	v
LIST OF TABLES	x
LIST OF FIGURES	xi
ABBREVIATIONS AND ACROYMNS	xii
ABSTRACT	xiii
CHAPTER ONE	1
INTRODUCTION	1
1.1 Background to the Study.....	1
1.1.1 Study Setting.....	4
1.1.1.2 University of Ghana, Legon.....	5
1.1.1.3. Kwame Nkrumah University of Science and Technology (KNUST)	6
1.1.1.4 University of Cape Coast (UCC)	7
1.2 Statement of the Problem.....	8
1.3. Purpose of the Study	9
1.4 Objectives of the Study.....	9
1.5 Scope of the Study	10
1.6 Theoretical Framework.....	10
1.7 Significance of the Study	14
1.8 Organization of the Study	14
1.9 Chapter Summary	15
CHAPTER TWO	16
LITERATURE REVIEW	16
2.1 Introduction.....	16
2.2 Reference Services.....	16
2.3 Concept of Digital Reference Service (DRS).....	19
2.4 Methods and Tools for DRS in Libraries.....	22
2.4.1 Asynchronous digital reference service	22
2.4.1.1 Email	23
2.4.1.2 Web Form	24
2.4.1.3 Chatterbots	24

2.4.2 Synchronous service	25
2.4.2.1 Web chat	25
2.4.2.2 Collaborative networks	26
2.4.2.3 Ask -A -Services	27
2.4.2.4 Video-conferencing or web-cam service	28
2.4.2.5 Social Media	28
2.5. Awareness and Uses of DRS in Academic Libraries.....	29
2.5.1 Role of Academic Libraries	29
2.5.2 DRS in Academic Libraries	30
2.5.3. Awareness of DRS in Academic Libraries	33
2.5.3.1 Academic Library Websites.....	34
2.6 Librarians Working with DRS	35
2.7. Training of librarians	37
2.8 Infrastructure for DRS	38
2.9 The challenges in the implementation and management of DRS in Libraries	39
2.9.1 Implementation of DRS	39
2.9.2 Policies and Guidelines.....	40
2.9.3 Evaluation of DRS	41
2.9.4 Challenges in DRS use.....	42
2.10 Measures to improve DRS in Libraries	45
2.11 Chapter Summary	46
CHAPTER THREE	48
METHODOLOGY	48
3.1 Introduction.....	48
3.2 Research Design.....	48
3.3 Selection of Cases	50
3.4 Selection of Subjects.....	51
3.4.1 Population of the Study.....	51
3.4.2 Sample Size.....	52
3.4.3. Sampling Technique	53
3.5 Instrumentation	54
3.5.1 Questionnaire	54
3.5.2 Pre-testing of Questionnaires.....	55
3.5.3 Interview	56

3.6 Data Collection Method.....	58
3.7 Data Analysis Procedure.....	59
3.8 Ethical Consideration.....	60
3.9. Chapter Summary	60
CHAPTER FOUR.....	61
DATA ANALYSIS AND FINDINGS	61
4.1 Introduction.....	61
4.2 Quantitative Analysis and findings.....	61
4.2.1 Response Rate.....	61
4.2.2 Background information	62
4.2.3 Level of awareness and use of DRS	633
4.2.3.1 Reference Service	63
4.2.3.2. Types of DRS Platforms used in Libraries	65
4.2.3.3 Level of Awareness.....	66
4.2.3.4 Use of DRS	68
4.2.4 Users’ view on DRS.....	71
4.2.4.1 Users’ View on DRS.....	71
4.2.5 Training on DRS.....	78
4.2.6. Challenges related to the implementation and management of DRS	78
4.2.6.1 Evaluation of DRS	78
4.2.6.2 Challenges of DRS.....	79
4.2.7 Suggestions and Recommendations.....	81
4.3 Qualitative data analysis and findings	83
4.3.1. Background.....	84
4.3.2. Level of awareness and use of DRS	84
4.3.2.1. Reference Service	84
4.3.2.2. Types of DRS.....	84
4.3.2.3 Level of Awareness.....	85
4.3.2.4 Uses of DRS.....	86
4.3.3 Views of Librarians concerning usage of DRS.....	87
4.3.4 Training of librarians on DRS.....	90
4.3.5 Infrastructures and Technologies used for DRS.	91
4.3.5.1 Infrastructure and technologies.....	91
4.3.6 Challenges in the implementation and management of DRS.	92

4.3.6.1 Implementation of DRS	92
4.3.6.2 Management of DRS.....	92
4.3.6.2.1 Policies and Guidelines to manage DRS	92
4.3.6.2.3 Funds.....	93
4.3.6.2.4 Evaluation of DRS	93
4.3.6.2. Challenges of DRS.....	94
4.3.7 Ways to improve DRS	94
4.4 Chapter Summary	95
CHAPTER FIVE	96
DISCUSSION OF MAJOR FINDINGS.....	96
5.1 Introduction.....	96
5.2. Level of Awareness and Use of DRS	96
5.2.1 Reference Service	96
5.2.2 Methods and Tools for DRS	97
5.2.3 Level of Awareness and use	99
5.3 Users and Librarians’ View on DRS	101
5.4 Training.....	105
5.5 Infrastructure and Technologies used for DRS.....	106
5.6. Implementation and Management of DRS	107
5.6.1 Implementation and Management of DRS	107
5.6.2 Policies and Guidelines to manage DRS	108
5.6.3 Funds.....	108
5.6.4 Evaluation	109
5.6.5 Challenges of DRS.....	109
5.7. Ways to improve DRS	110
5.8 Chapter summary	111
CHAPTER SIX.....	113
SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS	113
6.1 Introduction.....	113
6.2 Summary of findings.....	113
6.2.1 Level of Awareness and Use of DRS in Academic Libraries.....	113
6.2.2 Users and librarians’ views.....	114
6.2.3 Training.....	114
6.2.4 Infrastructure and Technologies	115

6.2.5 Management and Implementation of DRS	115
6.2.6 Ways to improve DRS	116
6.3 Conclusion	116
6.4 Recommendations.....	117
6.4.1 Recommendations on improving the awareness and use of DRS.....	117
6.4.2 Recommendations on training and capacity in DRS in academic libraries	118
6.4.3 Recommendations on infrastructure and technologies in DRS in academic libraries	119
6.4.4 Recommendations for the management of DRS in academic libraries	119
6.5 Contribution to Knowledge.....	120
6.6 Suggestions for Future Research	121
BIBLIOGRAPHY	123
APPENDIX 1	137
QUESTI ONNAIRE FOR DRS USERS AT UG, KNUST AND UCC	137
APPENDIX 2.....	144
INTERVIEW FOR DRS LIBRARIANSAT UG, KNUST and UCC	144
APPENDIX 3.....	147
INTERVIEW GUIDE FOR HEADS OF LIBRARYAT UG, KNUST and UCC.....	147
APPENDIX 4.....	150
INTERVIEW GUILDE FOR HEADS OF IT AT UG, KNUST and UCC	150

LIST OF TABLES

Table 3.1: Population of the Study.....	51
Table 3.2: Sample Size.....	53
Table 4. 1: Demographical Data of Respondents.....	62
Table 4.2: Chanel of Reference Services used for Queries.....	64
Table 4.3: Preferred Reference Service.....	64
Table 4.4: Place of Access.....	67
Table 4.5: Access to DRS after Library Hours.....	67
Table 4.6: Frequency of use of DRS.....	69
Table 4.7: Medium of Access.....	69
Table 4.8: Purpose of using DRS.....	70
Table 4.9: TRS VRS DRS.....	71
Table 4.10: Users' Ability to Clarify themselves on DRS.....	72
Table 4.11: Prompt Response on DRS.....	72
Table 4.12: Duration of Responses on DRS.....	73
Table 4.13: Satisfaction of Feedback Received from DRS.....	73
Table 4.14: Reference to other sources.....	74
Table 4 .15: Internet Challenges.....	79
Table 4.16: Challenges in feedback.....	79
Table 4 .17: Challenges in the use of DRS.....	80
Table 4.18: Ways to improve DRS.....	82

LIST OF FIGURES

Figure 1: The General digital reference model.....	11
Figure 4.1: Preferred DRS platform.....	65
Figure 4. 2: Channel of Awareness.....	66
Figure 4.3: Reasons for using DRS.....	68
Figure 4.4: First Response received from DRS.....	75
Figure 4.5: Influences of DRS on Library Services.....	76
Figure 4.6: Usefulness of DRS.....	77
Figure 4.7: Recommendation of DRS by users.....	81
Figure 6.1: Proposed General Digital Reference Model.....	120

ABBREVIATIONS AND ACROYMNS

- CARLIGH - Consortium of Academic and Research Libraries in Ghana
- DRS - Digital Reference Service
- FAQ - Frequently Asked Question
- FREQ. - Frequency
- IFLA - International Federation of Library Associations and
Institutions
- IT - Information Technology
- KNUST - Kwame Nkrumah University of Science and Technology
- RUSA - Reference and User Services Association
- TRS - Traditional Reference Service
- UCC - University of Cape Coast
- UG - University of Ghana

ABSTRACT

The deployment of technological innovation in libraries has been one of the underlying impetus for the use of Digital Reference Service (DRS) in academic libraries. DRS is where patrons employ Internet technology to communicate with librarians without being physically present. The purpose of the study is to examine the extent to which Digital Reference Services supports user needs in academic libraries in Ghana.

The main objectives of the study were to investigate the level of awareness and use of DRS by librarians and library users training of librarians and users on DRS, the availability of infrastructure and technologies for DRS, and the challenges in the implementation and management of DRS.

The mixed method design was used to gather data from three hundred and thirteen (313) respondents comprising three hundred (300) DRS users and thirteen (13) library professionals from the University of Ghana (Balme Library), the Kwame Nkrumah University of Science and Technology (Prempeh II Library) and the University of Cape Coast (Sam Jonah Library). The theoretical framework adopted for the study was the general digital reference model by Pomerantz, Nicholson, Belanger and Lankes (2004). Even though the original model concentrated on five components, this study expanded the model by integrating users, librarians and evaluation in DRS processes.

The findings revealed that there is adequate infrastructure, technologies and training facilities and programs available to both DRS librarians and users. The findings of the study indicated that some of the librarians were aware of DRS yet they resisted being part of the service. It was recommended that users' and librarians' awareness must be increased

to boost the number of DRS users, and to get more librarians on board to provide prompt responses to users. The study again suggested that libraries must develop policy and guidelines in the use of DRS as well as evaluation.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The advancement of information and communication technologies (ICT) , increase in the use of internet and other technologies have brought a huge impact on reference services as well as the approaches and expectations of librarians and patrons. Academic libraries are adopting more technologies to enhance reference services in order to accomplish users' needs in the virtual environment. The provision of reference services is a link between patrons' needs and the resources available in the libraries (Yonus, 2014).

The Digital Reference Service (DRS) is one of the varieties of innovations deployed in the library environment since the year 2000 (Nordin, *et al.*, 2012). Many people depend on Internet resources while few people approach the library counter for support, therefore there is the need for approved method of communication between patrons and librarians. Academic libraries have acted in response by providing reference service via DRS such as email, Ask-a-librarian, chat services, Facebook, Twitter, WhatsApp among others to their users (Yonus, 2014). The introduction of the world wide web (WWW) has enabled libraries to respond to users' queries via webforms and have extended the role of reference service further than the email, the telephone and text messages. Academic libraries have started providing reference services via the Internet known as Digital Reference Service (DRS) (Wasike, 1999).

Digital reference service is defined by Kasowitz, Bennett and Lankes (2000) as Internet-based information services that employ humans' mediators. Reference and User Services Association (RUSA) (2010) also defined DRS as an electronic reference services usually in real-time where computers and other Internet technologies are employed by patrons to communicate with librarian without being physically present in the library. This reference service is virtually carried out with the reference transactions being a computer mediated delivery to users. DRS provide help to users in finding the appropriate information in answering their questions to fulfilling their information needs.

According to Kern (2009), digital reference service is the usage of asynchronous and synchronous transactions in reference services. Synchronous transactions is associated with a real-time computer-mediated method between a librarian and an information seeker whiles the asynchronous transaction is about all computer-mediated communication that is sent by the user and feedback is received at different times. Synchronous services include instant messaging; videoconferencing and asynchronous communication also include texting and emails.

DRS is often an extension of an existing reference service programme where patrons could be writing from home, work or a variety of other locations (Pace, 2003). According to Francoeur (2001), there are two factors that necessitate the establishment of DRS in libraries: (1) the growing intelligence of librarians that need to be reach out to bring users back to the library via online and (2) library users using the Internet to reach out to librarians for their information needs without being present in that library. As a result few people come to libraries for help since there is a remote communication between information seekers and librarians. Globally there are number of libraries that have

established digital reference services with the use of e-mail and instant messages as a way of communication and software vendors have started to develop product to be used for some DRS platforms (Kasowitz 2001; Penka, 2003). The Rapid development in libraries has increased the demand for virtual services and academic libraries are significant contributors to the development (Lopes, 1992).

A successful reference service is an effective strategy that enhances the utilisation of resources to warrant users' satisfaction through an effective reference services and the accuracy and speed in handling users' queries by librarians have a great effect on their satisfaction. The roles of librarians have been improved by societal expectations through enhanced electronic capabilities. User education remains essential in the online environment. The use of digital resources has contributed to re-shaping information retrieval and access practices in university libraries (Chowdhury, 2002). The library must put into consideration of establishing a department mainly for digital reference service for effective development (Lankes, 2000).

In the advanced countries, librarians have embraced Web technologies to offer effective reference services to their users. However, in Africa, academic libraries' response in the use of digital reference services need to be dealt with earnestly and this is also serious for reference librarians (William *et. al*,2004). According to Yonus (2014), the implementations of digital reference services involve a well develop guidelines that provide directions for effective management of the DRS but in Africa, little is known about this. These guidelines include The International Federation of Library Associations and Institutions Digital Reference Guidelines (IFLA, 2008), The RUSA Guidelines for Implementing and

Maintaining Virtual Reference Services (RUSA, 2010) and RUSA Guidelines for Behavioral Performance of Reference and Information Service Providers (RUSA, 2013).

Radford (2006) indicates some of the challenges associated in the implementation of DRS. These include the lack of collaborative network, lack of rapid access, poor interactive interfaces, poor digital document imaging, poor management of distributed database, inaccessible hypertext information retrieval, lack of enforcement of intellectual property rights, poor integration of multimedia information services, poor management of multilingual collection, nonexistence of information mining, absence of electronic reference service, lack of electronic document delivery and selective dissemination of information.

Strong (2006) states that email reference interview is difficult therefore, reference interview must be conducted by a well-trained staff who will furnish users with accurate and comprehensive information. Moreover, Digital Reference services must be available on 24 hours basis in any part of the world, for flexible use in the community but the service discontinues when the library is closed. Librarians and users must acquire the necessary skills in the use the digital information (Okongo, 2014). In this way, libraries will be able to connect to users to assist them in every possible way (Ahenkorah-Marfo, 2015). The digital landscape has changed so rapidly that it has become necessary to employ other alternatives such as Digital Reference Service in Academic Libraries in Ghana.

1.1.1 Study Setting

The study involved three public universities in Ghana. These academic libraries were selected because they were the first three ranked public universities (UniRank, 2016)

among the ten (10) public universities in Ghana. Also these universities were the first three universities established in Ghana. These universities include University of Ghana, Legon (UG) which was founded in 1948, the Kwame University of Science and Technology (KNUST) established in 1951 and the University of Cape Coast (UCC) founded in 1962.

1.1.1.2 University of Ghana, Legon

The University of Ghana, Legon (UG) is the oldest university in Ghana. It was formally known as University College of the Gold Coast and it was founded by Ordinance on 11 August 1948 for the purpose of providing for and promoting university education, learning and research under the chairmanship of Rt. Hon. Walter Elliot in the British colony of Gold Coast recommended by West African Commission of the Asquith Commission on Higher Education. The University of Ghana gained full university status in 1961. The University offer undergraduate and postgraduate programmes (Bailey, Cloete, & Pillay, 2011).

According to University of Ghana enrollment and graduation statistics (2016), UG has a student enrollment of about thirty-seven thousand nine hundred and forty (37,940). The University of Ghana has strong ICT infrastructure base and well equipped libraries that facilitate a variety of recorded knowledge that covers the curricular run by the institutions. The main university library is Balme Library which was established 1948. The library was named after the first principal of University of Ghana, David Mowbray Balme. The Balme library has other satellite libraries in the schools, faculties, institute, departments and halls of residence (Balme Library, 2000).

The Balme library has internet access and form part of a consortium of academic and research libraries in Ghana (CARLIGH) which provide access to online resources to serve the university community. The Balme library has a wide range of e-Resources comprising

academic online journals, e-books and print books in their library holdings of their satellite and departmental libraries (Ahenkorah-Marfo, 2015). The library organizes orientation and training programmes for its users (Amekuedee, 2005). The Balme library has employed new trends in information delivery which include the use of social media and Digital Reference Services to support reference user service. The Ask-a-Librarian live chat service has been employed to assist users' queries. This enables users to reach out to the library without boundaries (Ahenkorah-Marfo & Akussah, 2016).

1.1.1.3. Kwame Nkrumah University of Science and Technology (KNUST)

The Kwame Nkrumah University of Science and Technology was established in 1952. It was formally known as Kumasi College of Technology and is the second oldest and largest University in Kumasi. It was also affiliated to the university of London and gain full affiliation in 1961 (KNUST, 2016). The name of the university honours the first president of Ghana, Dr. Kwame Nkrumah. KNUST offers undergraduate and postgraduate programmes (William, Osei, & Omar, 2012).

The total student population of KNUST is about forty-two thousand, five hundred and ninety (42,590) students (KNUST, 2016). KNUST has well equipped ICT infrastructure base with internet access and libraries that help covers the curricular run by the institutions. The main library of KNUST is the Prempeh II Library. The library was named after the king Asantehene Agyemang Prempeh II(1935) who continued the vision of his predecessor the king Asantehene Agyemang Prempeh I to establish KNUST. The library was as a result of library collections transferred from Achimota training college (Lamprey, 2010). The Prempeh II library also form part of the consortium of academic and research libraries in Ghana (CARLIGH) which provide access to online resources to serve the

university community (Ahenkorah-Marfo, 2015). The Library provides information in electronic and print formats to staff and students mainly to support teaching, learning and research in science and technology for national development. The library organizes orientation and training programmes for its users (Agyen-Gyasi, 2008). The Prempeh II library has also employed the use of social media and Digital Reference Services such as email to satisfy the information needs of their patrons (Ahenkorah-Marfo & Akussah, 2016).

1.1.1.4 University of Cape Coast (UCC)

The University of Cape Coast (UCC) is another prestigious public university located in Cape Coast, Ghana. The university was established in 1962 out of a dire need for highly qualified and skilled manpower in education. It was established to train graduate teachers for second circle institutions. UCC offer both undergraduate and graduate programmes. The institution holds a student population of thirty-five thousand, nine hundred and twenty-two (35,922) (UCC, 2016).

The university has facilities such as ICT infrastructure and well equipped libraries that cover the curricular run by the institutions. The Sam Jonah library is the main library of UCC in addition to other departmental and satellite libraries. The UCC library was named after the Chancellor of UCC Mr. Sam E. Jonah. The Sam Jonah library also form part of the consortium of academic and research libraries in Ghana (CARLIGH) which provide access to online resources to serve the university community. The Sam Jonah library has a wide range of both print and electronic resources comprising academic online journals, e-books in their library holdings (Ahenkorah-Marfo, 2015). The library also organizes orientation and training programmes for its users. The library has extended their services

to include e-mail, Facebook and Twitter as a form of digital reference services to satisfy the information needs of their patrons (Ahenkorah-Marfo & Akussah, 2016). Hence, the effectiveness of DRS in these three academic libraries is what this study seeks to investigate.

1.2 Statement of the Problem

According to Cummings, Cummings, and Frederiksen (2007), DRS is extensively helping in the delivery of quality library services. DRS in one way or the other satisfy the informational needs of users as librarians can deliver materials and other relevant resources to the user. Yonus (2014) underscores how DRS enhances virtual access to information and reduces cost of information. The service may extend when the library is closed. Digital reference service provides faster method of accessing and utilizing of information. This serves as a useful channel for the dissemination of knowledge and also powerful machinery that can help improve study performance (Okongo, 2014).

The provision of real-time reference services, collaborative networks among libraries, development of quality technical standards for DRS in academic libraries are very limited (Kasowitz, 2001) and virtually non-existent in many academic libraries in Ghana. Limited literature has been found to establish the level of application of DRS in Ghanaian academic libraries. For instance, Ahenkorah-Marfo (2015) examines the knowledge and use of social media by reference and user services librarians in Ghana. This study however fails to access the knowledge level from library user perspectives. Idan (2017) also studied DRS in academic libraries in Ghana but limited the scope to only one public university, KNUST.

From the literature, it is uncertain whether library staffs are trained to carry out digital reference services which include responding promptly to email queries, conducting the reference interview accurately to meet users' need (McGlamery & Coffman, 2000). There is also no confirmation whether patrons receive prompt responses to their queries or are satisfied with the responses provided by the librarians (Nordin, Kassim, & Baharuddin, 2012). Thus the extent of users' dissatisfaction or complaint of poor information service delivery by the academic library may continue to be ignored. The current study attempts to provide evidence of the level of knowledge of DRS from both user-side and service provider (librarians) perspective. Aside, the study sample of this study allows for comparative analysis among academic libraries in Ghana, thus bridging the gap in the study of DRS in Ghana. It is for this reason that the study seeks to explore the extent to which DRS supports user needs in academic libraries in Ghana.

1.3. Purpose of the Study

The purpose of the study is to examine the extent to which Digital Reference Service supports user needs in academic libraries in Ghana.

1.4 Objectives of the Study

The specific objectives of the study are:

1. To investigate the awareness and use of DRS by users of three selected Academic Libraries in Ghana
2. To explore the views of users and librarians concerning usage of DRS in the three selected Academic Libraries in Ghana.

3. To find out if users and librarians are trained on DRS in the three selected Academic Libraries in Ghana.
4. To investigate the available infrastructure and technologies used for DRS in the three selected academic libraries in Ghana.
5. To identify the challenges in the implementation and management of DRS in the three selected academic libraries in Ghana.
6. To make appropriate recommendations based on the findings.

1.5 Scope of the Study

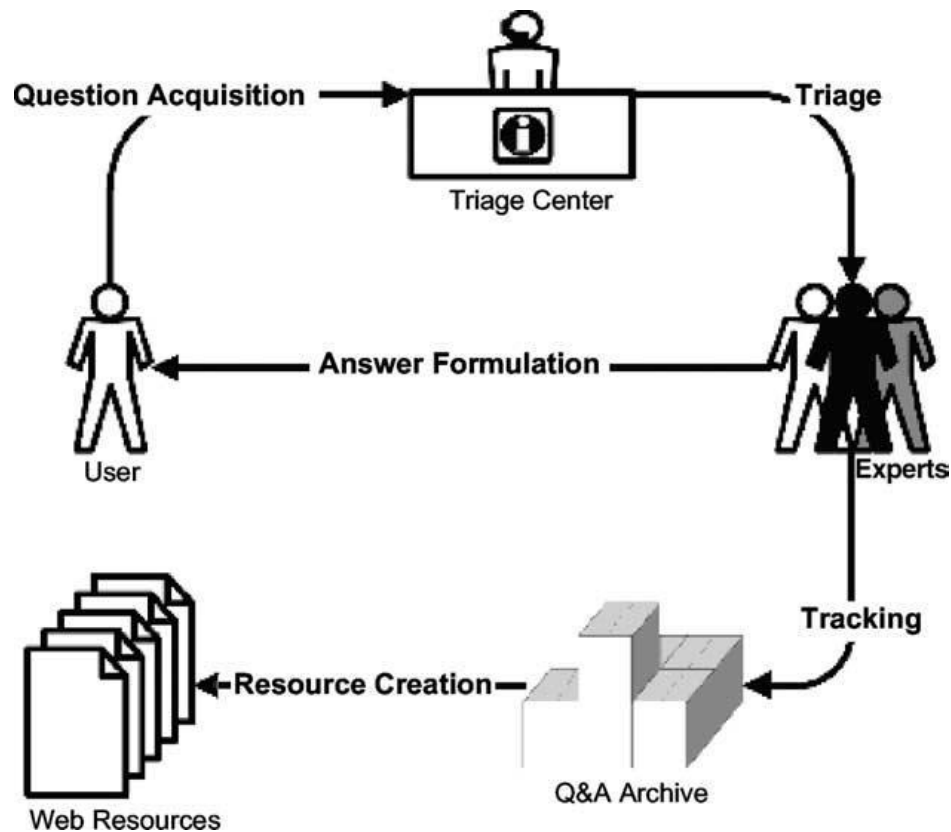
The research focused on digital reference services in academic libraries in selected academic libraries in Ghana namely, Balme Library (UG), Prempeh II Library (KNUST) and Sam Jonah Library (UCC). The study involved heads of the three libraries, Digital Reference Service Librarians and users of the library. The study was delimited to DRS platform such as Ask-a-librarian live chat, email, Facebook messenger, telephone calls and Twitter handle. This is because observations and information gathered from the preliminary studies indicate that, these Digital Reference service tools are used by these three selected Academic Libraries.

1.6 Theoretical Framework

A theoretical framework of a research describes and introduces theories that inform the research problem under study (Trochim, 2006). A theoretical framework relates a study with existing knowledge in area understudied. It enables the researcher to get meaningful understanding about the different characteristic studied.

The study adopted the general digital reference model by Pomerantz et al., (2004). This process is an expansion of an existing general process model by Lankes (1998) from the virtual reference desk project. The process model has been used by several authors including; Yonus (2004), Uutoni (2014) Ramos and Abigo (2011) to study issues that surrounding Digital Reference services in academic libraries. Below is the diagram of the General digital reference model represented in figure 1.1

Figure 1.1: General digital reference model



Source: Pomerantz et al. 2004

The individual variable in the general digital reference model are explained below:

Question acquisition: These are issues related to the process of getting information from a user. This does not only include user's question, but also categorization of questions and identification of user information, via e-mail, web forms and chat services support (Pomerantz, et al. 2004). This variable corresponds to objective one and two which explores awareness, use and views concerning usage of DRS in the three selected academic libraries

Triage: is the assignment and routing of a question to a digital reference service, and to a reference or subject expert within a service. This step may be automated or conducted via human decision support. Triage also includes the filtering of repeated questions or out-of-scope questions. Queries are arranged according to some date received. The reference librarian attends to the questions. Triage reduce repeated and out of scope queries. This step may be done by automation or by human decision support (Pomerantz, et al. 2004). This variable links to objective two and four which investigate the views of librarians concerning usage of DRS and infrastructure and technologies used for DRS in the three selected academic libraries

Answer formulation: This includes “all actions taken by the librarian to generate answers to queries, including sending the response to directly to the user or to a reviewer” (Pomerantz, et al. 2004). This variable corresponds to objectives two and five which examined the views concerning usage of DRS and the management of DRS in the three selected academic libraries

Tracking: This is about recognising popular queries mostly asked by the library patrons based on topics. Tracking allows librarians to recognise frequent questions arising from

users queries. Tracking can also be termed as frequently asked questions (FAQs) (Pomerantz, et al. 2004). This variable was linked to objective two which investigated the views of users concerning DRS.

Resource creation: This track the data to add up to the resources to satisfy users' request. It also expands collections to satisfy users' information needs (Pomerantz, et al. 2004). This variable corresponds to objective four which explores the technologies used for DRS in the three selected academic libraries.

User: A user is the one who asked librarian question on DRS. The user sends queries to the librarian via telephone calls, text messages, e-mail, Webforms, chat, Ask-a-librarian service and other platform. The librarian receives questions from the user (Berube, 2003). This variable concurs with objective two which find out the views of users concerning the usage of DRS in the three academic libraries.

Librarian: A Librarian is the one who receives users' queries, review the questions and take decision on the appropriate way to respond to the questions (Wasike, 1999). The librarian verifies the question depending on the type of question in the previous asked questions in the web resource to answer users. The librarian answers the questions if the answers are readily available. This variable was used to answer questions on training and management which agrees to objective three and five.

The general digital reference model was adopted for the study to determine whether academic libraries in Ghana follow the model in implementing and managing digital reference services with regard to users and librarians.

1.7 Significance of the Study

Information professionals and library users would benefit from this study by having knowledge of the benefits of DRS and have insight in the barriers of accessing the digital reference services within the library and in remote environment.

The study would help policy makers and management of the University of Ghana, the Kwame Nkrumah University of Science and Technology and the University of Cape Coast and other academic institutions to improve their level of achievement of digital reference service for effective and efficient services in the libraries.

The library management of the University of Ghana, Legon, the Kwame Nkrumah University of Science and Technology and University of Cape Coast would be able to determine the benefits and the challenges of digital Reference services, and therefore come out with mechanisms that would be geared towards the use, access and challenges of Digital Reference Services in the academic libraries.

The study will also add to existing knowledge in the area of digital reference services

1.8 Organization of the Study

The research was structured into six (6) chapters.

Chapter One is the introduction which entailed background of the study, statement of the problem, the study area, purpose of the study, research objectives, the theoretical framework underpinning the research and the significance of the study.

Chapter Two reviewed the literature of related studies such as reference services, concept of digital reference services, types of DRS used in academic libraries, level of awareness and use, librarians working with DRS, training of librarians on DRS, infrastructure used

for DRS, challenges in the implementation and management of DRS and measures to improve DRS.

Chapter Three dwelt on methodology used for the study. It includes the research design, population for the study, sampling and sampling procedure, instruments for data collection and data collection procedures and analysis .

Chapter Four presented the analysis of data and findings of the study.

Chapter Five was the discussion of major findings.

Chapter Six covered the summary of findings, conclusion, and recommendations made from the findings of the study.

1.9 Chapter Summary

In chapter one, the background of the study was given, defining the research problem and outlining the research objectives and questions. The study setting, the theoretical framework and the significance of the study were also established. The organisation of the study was the final item dealt with in the first chapter.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Review of the literature offers a researcher the opportunity to explore the outcome of other largely related study undertaken. Review of literature provides an in depth understanding of the subject or the topic and its significance to other studies. It identifies the methods used in previous research on the topic. Literature review directs the current research to fill in gaps and extending prior studies. Because research adds to existing knowledge, it would be therefore, difficult to conduct a study without reference to other scholars (Creswell 2012).

In this study, a review of the related literature was centered on the world, African, and Ghanaian contexts. Issues surrounding digital reference services such as reference services, concept of digital reference services, types of digital reference services, level of awareness and use of digital reference services in academic libraries, librarian for digital reference services, training of librarians, infrastructure and technologies for digital reference services, challenges in the management and implementation of digital reference services and measures to improve digital reference services were reviewed.

2.2 Reference Services

The term reference service was initiated by Samuel Swett Green in 1876 in his book 'personal Relations between Librarians and Readers'. A reference service is about answering users' questions or queries. Oketunji (2005) describes reference services as a

librarian giving assistance and a professional advice to users especially on the available library materials in the library's collection or other libraries elsewhere. The reference librarian serves as a guide to the individuals using the library or making enquiries by mail, telephone or online in order to meet their information needs.

According to Bunge and Bopp (2001), a reference service is a peculiar assistance provided by well-trained staff of the library to users seeking information. This peculiar role performed by reference librarian to users are services particularly known as reference and information services in library work. An important part of reference service is providing assistance to users in using library resources as well as securing information from the library for their research and studies. Also, it is a personal discussion between a user and a librarian where the librarian understands the user's needs and tries to provide information for the user to select what exactly he or she needs. This is done through a reference interview select what exactly he or she needs.

Furthermore, Ifidon and Ifidon (2008) also assert that, reference service is helping users to locate relevant information from the library or other sources. This is not only about leading users to the shelves to identify and locate the needed materials but particularly guiding users to locate the relevant materials that will satisfy a particular need. Librarians must guide users to select from the mass of both relevant and irrelevant materials. Again, they defined reference services as giving a direct personal assistance to patrons who are in quest for information for different purposes.

A reference service can be categorised into three broad groups. A reference service is an information service which involves either finding the information for the user or helping the user to find the information. Again a reference service involves teaching the use of

library resources which is also known as information literacy. Lastly, it is user guidance where users are guided to select the best information sources and services (Bunge, 1999). Bunge and Bopp, (2001) identified four components of reference services in Green (1874) paper “personal contemporaries of Green” which are considered as the basic functions of reference service such as:

- i. instruct the reader how to use the library
- ii. answer the reader's queries
- iii. aid the reader in the selection of good reading material and
- iv. Promote the library within the community.

In the late nineteenth and early twentieth century, libraries established reference service in order to satisfy and better serve their patrons. Also, Jane (2003) outlines several factors and trends that lead to the development of such service which include:

- an increase in the number and variety of information resources
- available in libraries and outside, the complexity of information resources,
- the difficulty faced by people in finding the required resource and in locating the particular information within that resource,
- an increase in the number and diversity of library users which led to a wider range of information needs, queries, and sophistication for searching information,

The essential part of a reference service is the discussion between a librarian and user. The reference librarian understands the user on his needs and tries to assist the users with the information search for the user to select what exactly what he or she needs. The reference librarian's duty is to assist patrons to identify the needed information and to teach them

how to become self-sufficient library users (Chowdhury, 2002). Studies have proven that the traditional reference service remains the most used service in the library. It is the first point of getting help in the library. Traditional reference counter remains users' first choice in getting information. Also, it is the most used reference method in getting help in the library. Although many academic libraries have accepted the use of DRS yet, in getting help or getting answers to queries from the library, users prefer the traditional reference desk to the digital reference service. (Grandfield & Robertson, 2008).

Osinulu (2003) states that a modern reference service is marked by four distinctive features: (1) the willingness and ability of librarians, generally, to give reference aid; (2) a staff devoted exclusively to reference work; (3) reference collections stored on open shelves in rooms planned as reference quarters; and (4) ready guides to library resources. He further opines that poor reference services create a bad impression or poor image about the library.

Kadir Wan Dollah and Singh (2010) confirm the view that in spite of the numerous advantages of digital reference services, most users still prefer the traditional method of seeking help from the library. Users continue to use the traditional reference desk instead of digital reference services.

2.3 Concept of Digital Reference Service (DRS)

The significance of reference services grew over time with the introduction of new technologies in libraries. As a major component of library services, reference services are constantly developing. Reference services are constantly rising from the traditional method to automated, to hybrid, and to digital as part of the function of library services. (Gross, McClure & Lankes, 2001). Recently a lot of researchers have carried out studies that have

brought to bear the positive and adverse impact of DRS. Quadri and Aboidun(2017) aver that academic libraries were the first to implement DRS in the early 1980s, whereas the study of Dollah and Singh (2012) made it clear that libraries and librarians are trying their best to satisfy library customer through digital reference service.

Over the years, academic libraries have experienced a major shift in technology. The technological activities in library operations have been a matter of concern to libraries. Search engines and social media have become a strong competitor to libraries and librarians. Libraries and librarians are no longer the sole providers of reference and information service. Information can be access online; however, one cannot trust the authenticity of the retrieved information for that matter the services of libraries and librarian will continue to be essential in providing relevant information and other beneficial resources to their user community (Quadri & Aboidun, 2017).

The technological advancement have brought a total transformation in the reference service in academic libraries much that information can be accessed electronically via the Internet at a low cost which is an effective and efficient alternative to traditional methods. Information access by students has changed from traditional to electronic and academic libraries are working hard to meet patrons' expectations to achieve effective reference services (Chowdhury & Margarity, 2004). Librarians are working hard to satisfy users when they make reader enquiries for speedy and accurate information. Users are able to get their required information without moving from their destination to the library (Dollah, Kadir& Singh, 2007).

In 1984, reference services were launched through the Internet as Electronic Access Reference Service (EARS) by the University of Maryland Health Sciences Library, Baltimore, USA to offer assistance to users via e-mail. According to Still and Campbell, (1993) in the early 1990, a number of libraries begun to offer assistance via e-mail to some specific user community. Also, Kresh (2003) states that the first public library to launch IPL(Internet Public Library) was School of Information at the University of Michigan, USA in 1995. The service was to offer great assistance to communities through e-mail. There was also access to online collections as well as story time dedicated for children

The emergences of the DRS have indisputably affected how users think about reference services as well as how they request for information. The benefits derived from DRS are increasingly changing how users request and use information. Accessing information from the traditional reference desk is not enough for users; it appears that DRS is useful because librarian constantly monitors the progress of the request of patrons (Berube, 2004). Shachaf and Horowitz (2001) assert that users find DRS to be more useful and accessible to their requests as it provides services to users at any time, any place. Users may not come to the library due to physical disabilities, scheduling constraints or geographical distance moreover; the Virtual environment affords users who are shy in approaching reference librarian to submit their reference questions online. Indeed, most users expect a wide range of information resources preferably in full-text and ability to contact someone (usually by telephone or e-mail) when they require help using those resources (Dee & Allen, 2005).

Furthermore, technology is providing unlimited opportunities for people to exchange communication around the world. Similarly, libraries are breaking away from block structures built up over years. Some libraries are moving away from the print collection, on-campus facilities, published information instead they are driving toward digital communication, distributed learning resources, and an awesome creation and distribution of knowledge in multiple formats (Ferguson, 2000).

Again, Cummings, Cummings, and Frederickson (2007) posit that the ability to connect with users in diverse ways is necessary for user- librarian relationship. It is often cited as a reason that many new services are established to link users to the library. However, online communications are impersonal and task-oriented due to lack of facial and verbal cues as well as lack of context.

2.4 Methods and Tools for DRS in Libraries

Singh (2004) opines that basically asynchronous and synchronous are the two types of DRS. offered in libraries.

2.4.1 Asynchronous digital reference service

According to Berube (2003), asynchronous service is termed as communication in one direction at a time. Dollah and Singh (2012) and Nicholas (2011) are of the view that asynchronous services causes delay and prolong answers to the question especially with electronic mail and web forms. According to Schachaf and Horowitz (2008) asynchronous reference services permit librarians to answer requests in their own time, after having conducted the necessary search. This might enhance the accuracy and completeness of

replies. Asynchronous can be provided through e-mail, web form, chatterbots, among others.

2.4.1.1 Email

The most popular and widely used form of communication is electronic mail (e-mail). Email does not involve any other software. The queries are sent to the library's e-mail address by clicking on the e-mail address on the library webpage which activates the software for e-mail. Meola and Stormont (2001) aver that e-mail service allows enough time to provide answers to questions for better responses. Roesch, (2006) also asserts that an e-mail service is less expensive and easy to access. It eliminates physical barriers that prohibit some category of library users from seeking assistance in the library. Emails allow attachment of data files and these attachment files can be stored for future use.

However, Nicholas (2011) opines that there are a number of hindrances in the use of e-mail reference service. This is because it is difficult in conducting the reference interview and there may be a delay in response. Smith (2001) adds that there is the absence of non-verbal communication and sometimes takes more than 24 hours or more before library users receive responses to their queries. The reason is that the queries are not clear, Internet connectivity is low, or a document sent by the librarian to users exceeds the maximum size allowed. For instance, in Namibia, Uutoni (2014) identifies that there is lack of ability to demonstrate fully to users on how to use various library resources and this has become one of the challenges to the University of Namibia library and Namibia Polytechnic library.

2.4.1.2 Web Form

Berube (2003) describes web forms as anything that contain some compulsory fields such as users details, which the user needs to fill in order to obtain answers. Also, McGillis & Toms (2001) explain that web forms are located on the library webpage with fields such as personal details and question of the user. These fields are completed and sent back to the library. Answers are provided through email, phone, fax or post. According to Dinkelman, and Stacy-Bates (2007), web forms give users the opportunity to provide enough details about their questions. This helps the librarian to better understand users' need.

2.4.1.3 Chatterbots

Roesch (2006) asserts that chatterbots are computer software where the questions asked by the patron are analysed by keywords. The keywords are then matched with answers that have been registered in the knowledge system to provide feedback to the users. This form of digital reference services users do not communicate with reference librarians but rather an interactive database of a wide range of pre-arranged information.

Furthermore, Chatterbots are represented by pictures (so-called avatars) technically similar to full-text search engines with an illusion of an online chat. The user receives response immediately after filling in the query. Chatterbots provide feedback on particular questions which essentially are FAQs using artificial characters (Rubin, Chen & Thorimbert, 2010). The University of Nebraska-Lincoln was the first to produce chatterbot. Mentor Public Library (MPL) and Akron-Summit County Public Library (ASCPL) are cooperating on the development of chatterbots to provide help and guide users to the catalogue to answer questions about the availability of materials, and user accounts (Dee Ann, 2011).

2.4.2 Synchronous service

Synchronous service involves communication that takes place in real-time with an immediate response to questions (Roesch, 2006). According to Dollah, Kadir and Singh (2007), synchronous service is an internet communication between two people that is a library user and a librarian. The services can be provided through “web chat, Ask-a-librarian live chat, and Voice-Over-Internet Protocol (VoIP) and webcam services. Nicholas (2011) stated that synchronous services are using interactive technologies to communicate in real-time. The communication is between a library user and the librarian over the internet. This is a live reference where a library user exchanges communication with a librarian by a click on a button on a web page to get instant feedback on their question (Berube, 2003).

2.4.2.1 Web chat

The first chat reference was initiated by Bill Drew at SUNY Morrisville, New York in 1998. According to Roesch (2006) web chat or chat reference is an online communication between librarian and patron through brief written messages where they respond to each other at the same time. The computer displays a different window for sending the typed messages. The study of Mu et al. (2011) in US revealed that 85% of the academic libraries offer synchronous DRS using chat technology. Moreover, Meola and Stormont (2001) postulate that web chat is helpful to remote library users since communication with the reference librarian is in real-time. It has potential as an intermediate step between electronic mail reference and real-time audio and video conferencing.

Curry (2005) also brings out the importance of Web chat in reference services. Webchat facilitate online reference transactions especially online interview. In order for users to connect to the library, they must follow the link on the web page to type a message. A report of the transaction is provided to the user after the reference interview. Another copy of the report is archived for statistical record relating to the reference interview such as length of chat, topics, and place of the users.

Another reason why patrons use web chat is to avoid issues such as inconveniences on off-campus access and the struggles in telephone calls (Grandfield & Robertson, 2008). However, there are disadvantages in the use of chat reference. There is the absence of verbal cues as at times typing of messages can be awkward and irritating for some users. It is advisable to use chat reference for complex research questions (Roesch, 2006). Not all chat reference transactions are successful. Few libraries have suspended chat reference because of low volume, software problems and staffing model (Radford & Kern, 2006). In US, 36 out of 132 health academic libraries offer chat reference to support their reference service (Dee, 2005).

2.4.2.2 Collaborative networks

A collaborative network for reference is where two or more libraries come together to provide digital reference service to its users with both synchronous and asynchronous service. The user sends his or her queries to any member library. The query is then forwarded to the best member library which has the needed resources to answer the question (Yonus, 2014).

Shaw and Spink (2009) opine that individual institution or collaborative network can develop DRS to support one another. The collaboration comprises of online network of

local and international library that render services to user from any of their member libraries with an independent service is within a particular location. There are numerous national and international online network collaborated to support DRS in libraries. In January 2003, The National Library of Canada in collaboration with the community of Canadian libraries and research institutions established the Virtual Reference Canada, a bilingual web-based reference service. The Library of Congress DRS collaborative network currently has over 1500 members around the world (Kresh, 2003).

2.4.2.3 Ask -A -Services

Ask-a-service is a website that provides service like Ask-a-librarian question, Ask-an-expert question. Ask-a-question and Ask-Eric-question. Through this service, the questions are referred to an expert to answer. Many of the Ask-A- services provide online request forms so that users can ask questions and provide information that is needed to be able to answer the queries correctly (Ask-a-librarian, 2013). In this service, users provide information on how the information being asked for will be used for, the type of answer which they want and the sources which have been consulted already. This kind of information may help reduce irrelevancy. Some of the Ask-A services available on the web are Ask ERIC, Ask A question'', Ask Me virtual reference desk, Ask Jeeves (Ask Jeeves, 2014) and Ask Western Libraries which retrieve the best-matched answers from FAQs which replaced the scrolling lists that came back from search engines and Question point service (Berube, 2004).

Ruppel and Fagan (2002) explored whether Ask-a-librarian reference with instant message (IM) software to converse in real-time with students would solve some user's anxiety to the reference desk. Their finding reveals that Ask-a-librarian provides assistance from the

librarian to students with a great amount of convenience. However, in the Polytechnic of Namibia, the use of Ask-a-Librarian service was limited to users with specific information needs (Uutoni, 2014).

2.4.2.4 Video-conferencing or web-cam service

These forms include the visual element, which solves the communication problem inherent in the more text-based services. Librarians use both text and speech for reference. There is a window where both librarian and user can see each other while conducting face to face interview (Dollah & Singh, 2012). Training, staffing, time for implementing the service, cost, and lack of mobility for staff involved with the service are some of the challenges of this service (Nicholas, 2011). Maharana and Panda's (2005) study in 13 selected academic libraries in India revealed that, out of the 13, 6 libraries had employed video conferencing to offer reference services. This technology benefits distance learners, postgraduate students and researchers in their reference questions (Berube, 2003).

2.4.2.5 Social Media

Libraries over the world are getting hooked onto the use of social media as a form of DRS. This has become a personal norm and also as a means of engaging with patrons. Social media tools such as Facebook, Twitter, YouTube, and Instagram are employed in libraries to promote library services and resources in academic libraries. Librarians, therefore, see the use of social media as a good platform to accept reference queries in Ghana (Ahenkorah-Marfo, 2015).

Today, social media and Web 2.0 technologies such as Facebook, Twitter, blogs, and other social media resource can also be applied in reference services wherein library clients may

seek help 24hours from a librarian with no time delay response. For instance, Facebook messenger and Twitter handle are said to be popular in libraries because of their capability in syndicating and disseminating information by libraries (Cahill, 2009).

2.5. Awareness and Uses of DRS in Academic Libraries

As libraries develop into digital libraries, academic libraries must increase awareness in the use of digital reference service.

2.5.1 Role of Academic Libraries

Every institution has a distinctive and varied reason why they establish libraries. Despite the varied reasons, Universities libraries are established to support learning, teaching, and research. All the university libraries are called academic libraries. There are libraries found in the colleges and faculties in addition to the main libraries of the university (Badilah, Shahar & Chew, 1996). Apart from the universities, there are non-university institutions who also execute functions directly related to the universities such as the College of Education and College of Nursing. These non-universities also have libraries that support teaching and learning.

Some academic libraries hold relatively larger collections and are better funded with high qualified staff as compared to the public libraries, school libraries and special libraries. The academic libraries also serve as a repository of the universities publications. They provide resources and service to support each of the research project carried out by the university. The library is a learning center which provides materials to support learning, and for all the courses which are offered in the university and the other courses that may be introduced (Oakleaf, 2010).

The academic libraries provide the necessary resources needed for carrying out effective teaching and research activities to teaching staff and students of the university. The academic library is also expected to provide the information resources for the purpose of recreation, entertainment, general knowledge etc. The library contributes a lot to achieving the overall goals of the university. It is regarded as the heart of the intellectual system of the university. In recent times, academic libraries impact their institutions by winning awards or other distinctions which brings prestige to the university. The libraries services resources support institutional engagement in service to their community, locally, nationally and globally. They have well-trained professionals and as a result of this, they are able to provide better services to their users (Lee & Teh, 2000).

2.5.2 DRS in Academic Libraries

Digital reference service enables the libraries to incorporate new technologies in their reference services to meet users' expectation. It is an innovation in academic libraries which generates a lot of interest among students. Digital reference has been introduced as a formalised method of remote interaction between library users and the librarian (Han & Goulding, 2003).

The introduction of digital reference services in academic libraries have brought tremendous changes. It has revolutionised the traditional concept of reference service in libraries. DRS have also opened up a new chapter in libraries and facilitated global access to information, crossing the geographical limitation (Sears, 2001). It has enabled libraries to be able to serve diverse user groups. Moreover, DRS have improved the image and status of the libraries by enabling libraries to offer more equitable information services to their clients. The quality, efficiency, and effectiveness of information services have greatly

improved and has increased the user population of the libraries whereby users can now access off-campus electronic resources or remote access to information and they are able to collaborate and create networks (McClure, Lankes, Gross, & Choltco-Devlin, 2002).

Ferguson and Bunge (1997) affirm that DRS have increased the range of reference services in libraries and have created access to unlimited information from different sources making information flexible to users. Also, DRS have enhanced the knowledge and experience of librarians by reducing their workload as well as saving the time of users. It can be said that DRS have improved the quality of library services by speeding access to information and providing up to date information to users.

Again, DRS satisfy the needs of library clients outside the library environment. Students who are not familiar with Ask-a-Librarian chat services tend to prefer e-mail reference over chat reference (Nilsen, 2004). Likewise, faculty members who are not aware of the Facebook fan page will most likely submit their reference queries through a web form (Luo, 2008).

In Malaysia, among four selected academic libraries, 19.5% use email service, 4.9% use chat service, whereas 28.2% used the web form. 54.4% regard DRS as a quality service (Kadir WanDollah & Singh, 2010). Furthermore, Romero (2011) perceives that the benefits of DRS in libraries have over the traditional face-to-face reference service. He stated that DRS have the potential for improving the image of libraries. This is mainly because library activities and services which were not valued because they were not known can be better publicized. Thus DRS possess greater image building potential than the traditional face-to-face method. No doubt, the emergence of the DRS over the last decade have had an undeniable effect on the way users seek information, as well as on the way

they think about reference services. Idan's (2017) study indicates that KNUST offers DRS in the form of email service and off-campus electronic resource which enables users to get an answer from the library.

Also, Wang et al.'s (2004) study with 95 university libraries in China report that 81 (90%) academic libraries have DRS in their libraries. Likewise, Singh (2012) in a study at India with four selected university libraries reveals that only one library had developed a synchronous DRS via chat technology whereas three libraries offer asynchronous DRS via e-mail. Ramos and Abrigo (2012) affirm in their study at Philippines that 22 out of 356 academic libraries had developed DRS with the use of both asynchronous and synchronous technology such web form, FAQs, instant messaging, and VoIP to serve their library clients.

Digital reference services have facilitated global access to information and have also opened up a new segment in libraries crossing the geographical Boundaries. They have revolutionalised the traditional concept of reference services in academic libraries. Covey (2003) summarised some specific uses of digital reference service such as:

- Digital reference service provides a record of reference transaction, which facilitates cross-training and evaluation.
- The service gives users alternatives for communicating with Librarians in addition to the traditional reference desk and telephone inquiries.
- It offers the Librarian the opportunity to assist the hard - to- reach users in a reasonably convenient and expeditious manner.
- It makes reference service more inviting to users who regularly engage in real-time chat.

- Digital reference broadens and improves access to electronic information sources and also maintains a high level of staff expertise concerning Information Communication. Technologies.

2.5.3. Awareness of DRS in Academic Libraries

Academic libraries need to develop a high marketing strategy to create awareness about the availability of the digital reference services in the library. Librarians should have a clear professional understanding of the help-seeking preference of library clients. Awareness and exposure to DRS in the library can influence the help-seeking choices and preferences of library clients (Pomerantz & Luo, 2006).

According to Yonus(2014) one of the strategies of marketing DRS is to place a link of DRS on the library's homepage. The position of DRS link on library's website is a good strategy that enables users to discover the digital reference service easily. However, in Pakistan half of the libraries have buried DRS link under some other links on their homepages which had made it difficult for users to locate the service. On a continuous basis, academic libraries must put in place effective marketing strategies in order to publicise their DRS. The marketing strategies would help to expose and promote DRS to users. However, it is not enough to put a link of DRS on the library's website on DRS but it is equally important to promote DRS with the use of library instruction and posters. In order to keep DRS going staff promotion of the service is another important marketing approach. Librarians must work diligently to liaise with academic staff and researchers in the use of the digital reference services (Connaway & Radford, 2011).

There are a number of ways in which libraries and librarians could adopt in creating awareness of DRS. In a study by Qobose and Mologanyi (2015) at the University of Botswana library, students were asked if they were aware of DRS in the library, about 74% strongly agreed that they were aware whilst the remaining 26% disagreed. A greater number agreed because in the University of Botswana library, DRS were promoted at library exhibitions, important occasions on campus such as information literacy week and also during presentations at faculty and departmental meetings. This indicates that in the University of Botswana, most students are aware of the service in the library.

However, the study of Malik and Mahmood (2014) in Pakistan with 38 libraries of Higher Education Commission (HEC) indicated that only a few libraries were ready for DRS in their libraries while the others were implementing the DRS at a slow pace. Besides, Akor and Alhassan (2015) conducted a study in reference services with 160 students in 3 Nigerian universities. The findings of their study conclude at a response rate of 34 (28.3%) that the Provision of digital reference services was low at these three universities.

2.5.3.1 Academic Library Websites

In order to fulfill users' information needs in the web environment, some African countries are embracing new technologies to reshape and improve their reference services. Nowadays, more and more academic libraries are developing their own websites. The emphasis has shifted from processing printed materials to providing access to information via the web. For instance, Aman's (2004) study in Malaysia indicates that all the 10 public academic libraries have their own websites. The study of Sekyere (2011) in 10 West African countries with 60 academic libraries confirms that 11 libraries (18%) had DRS on their library website.

Ayiah and Kumah's (2011) findings at the University of Education, Winneba indicate that the library has a website but there was no DRS attached to the library website. Nevertheless, Ahenkorah-Marfo(2015) states that currently in Ghana the use of social media which is another form of DRS in reference services is gradually catching up with librarians in academic universities. He observed the websites of some universities in Ghana including University of Ghana, Legon, Kwame Nkrumah University of Science and Technology Library (KNUST), University of Cape Coast, Valley View University, Ghana Technology University College and Ashesi University College and reveals that these universities have websites linked to at least two social sites as a form of DRS.

2.6 Librarians Working with DRS

As libraries evolve into the digital library, some librarians have been considering how to adjust reference services to the new virtual environment. Over the last two decades with the emergence of information technology, the role of librarian has changed greatly and this has brought a huge impact on librarianship and information provision. The reference librarian duty has developed from collector and preserver of information resources to very complex issues of organization, dissemination, and access to information (Schement, 2002). According to Gross, McClure & Lankes (2003) selecting staff to handled DRS depends on the library's choice and the distribution of workload. In some libraries, the reference staff handles both traditional and digital reference at the reference desk, while in some other libraries select staff provides the DRS.

Sloan (1998) opines that the work of digital reference should be designated to a separate library staff devoted exclusively for the operation of DRS or equally allocated among library staff. Lankes and Kosowitz (1998) urge that librarians who are selected to work

with DRS must be physically competent in reference services to be trained to raise their competency, skills and comfort level in working with DRS. Furthermore, Strong (2006) states that many librarians working with DRS are used to traditional reference services. It is commendable for DRS librarians to have competencies such as the ability to respond to all inquiries, being proactive, knowledgeable, active listener and being neutral in opinions about the information provided. Also, librarians should possess good searching skills, the ability to write concise messages and the ability to deal with stressed and demanding users. They require new skills to be able to thrive in a digital environment (Francoer, 2001).

Rodwel (2001) postulates that in line with current practices in libraries, librarians are required to have higher technological skills. They should be knowledgeable beyond the collections of their libraries resources. He further concludes that a librarian in charge of DRS must understand the dynamics of production and dissemination of information in a virtual field and how it is received and accessed by clients. To improve and strengthen library support to users, it is critical for librarians in developing countries to understand how library practices are changing and what is required of them with regard to skills (Koelen & Quaye-Ballard, 2009). According to IFLA(2008) guidelines, for libraries to continue the use of DRS, responsibilities should be shared among staff. Also, the selection of DRS staff should be selected on the basis of ability, interest, availability, and skills to use the supporting technology.

2.7. Training of librarians

The changing role of libraries demands the technical know-how of accessing resources. Librarians are required to offer intellectual advice to users and this is possible when they have knowledge and skills of their duties through training. There is the need for libraries to have good training plans librarians (Rodwell, 2001). The training plans should include training materials and activities to train the librarians (Wassik, 1999). Enough training should be given to librarians responsible for DRS on how to use the services comfortably (Nicholas, 2011).

Campbell et al. (2002) also propose that training should be a continuous activity for DRS librarians. They emphasize that the first training on DRS must be at the implementation stage. This must be done to avoid panicking at their first reference question. In the same manner Kawakami and Swartz (2003) recommend that to ensure consistency in the provision of DRS libraries need to provide comprehensive and similar training to all staff members if they are expected to provide similar quality service. As new electronic reference tools are emerging in libraries, librarians also turn out to be clients that need instructions. Library staff must have a chance to learn about reference resources before it is available in the library to users (Cassel, 1999).

A study in two academic libraries in Namibia with 16 library staff shows that only one librarian have been trained on how to use the Ask-a-librarian service from her supervisor and colleagues whiles the other staff have received electronic resources and databases training but not on digital reference services. This means that most of the librarians in the

two academic libraries received no training on DRS (Utoni, 2014). According to IFLA (2008) and RUSA (2010) guidelines, for effective service librarians must be provided with time and resources. Continuous development education is also essential to equip librarians in the use of DRS. The library must have time scheduled for training, orientation and professional development education and also determine who trains librarians. The essential skills for librarian should include knowledge of reference sources, ability to multitask, good communication skills especially in writing, online searching skills, interview skills in the absence of visual and auditory cues (IFLA, 2008).

2.8 Infrastructure for DRS

On the issue of infrastructure, Radford and Kern (2006) state that several factors should be taken into consideration when implementing a digital reference service in libraries. In order to establish DRS in academic libraries, there must be enough computers to manage DRS. The cost of software, Internet connectivity and Internet enabled devices are essential element to be considered before the implementation of DRS in academic libraries.

Saffady (1995) enforce that in other to develop DRS in academic libraries, large information repositories, the various online databases, information products, computer storage devices on which information repositories reside, computerised networked library systems, the Internet, compact disk ROM, information products, database servers, online catalogues, and collections of computers and adequate technical support are technologies that are needed for the establishment of a successful DRS in academic libraries.

Emails and web forms technologies can be used to handle asynchronous transactions. Synchronous transaction technologies include web-based chat, instant message Ask-a-

librarian, among others. Also, some academic libraries had developed FAQ on their website to answer technical questions. (Yonus, 2014). He further state that in the development of DRS in academic libraries, libraries must develop good ICT infrastructure and for better performance there is an increasing need for libraries to update, upgrade and maintain their infrastructures.

2.9 The challenges in the implementation and management of DRS in Libraries

There are many challenges with the implementation and management of DRS in various institutions and these are outlined as follows:

2.9.1 Implementation of DRS

RUSA (2010) stress that in the implementation and management of DRS, it must be accorded the same standard and quality of goals as traditional reference service.

In this regard, Wassik (1999) propose some process of developing and implementing digital reference service in libraries:

- Informing: they are the preliminary investigation done to identify areas of expertise and existing service areas.
- Planning: these are procedures, methods, and policies on DRS are developed".
- Training: training programs are done to train staff for the service.
- Prototyping: this entails pre-testing of the service before launching.
- Contributing: exposure to the promotion of awareness and resource creation for service support.
- Evaluating: they are the service assessment used to identify improvement opportunities.

2.9.2 Policies and Guidelines

It is very important to establish parameter in the use of digital reference services. Cassel (1999) suggests that libraries should establish a digital reference service policy to determine the parameters of the services. These guidelines include the library's decision on how much time a staff member should spend on a question, and what the user should be told once it is determined that the question search is extensive. Before the implementation of digital reference service, libraries must have a set of lay down policies and guidelines that will direct the use of digital reference service, especially in academic libraries. The policy and guidelines must include the various aspect of reference service guidelines such as service parameters, service behaviour, service standards, response time, guidelines and benchmarks for the quality of the service. The policies and guidelines will provide direction and recommendations for effective implementation and management of DRS (Uutoni, 2014).

There is the need for academic libraries to follow guidelines in order to implement and maintain digital reference services (RUSA, 2010). IFLA Digital Reference Guidelines (IFLA, 2008) provide an acceptable directions and recommendations to all types of libraries across the world to implement a standardised DRS. This help libraries to control the quality of the service. The guidelines stress the need for devising a digital reference policy which must describe service goals, code of conduct, guidelines and a review of the policy. The issue of policies and guidelines are affecting the use of DRS in many academic libraries. For instance, a study by Malik and Mahmood (2013) reveal that most of the university libraries in the Punjab province had not devised any formal digital reference policy for their libraries.

2.9.3 Evaluation of DRS

The IFLA (2008) and RUSA (2010) guidelines suggest that evaluation of DRS should be related to evaluation of all library services. Libraries should conduct user surveys to monitor concerns, problems and questions from librarians and patrons. Formative and summative evaluation can be employed in libraries to assess the use of DRS.

Formative evaluation can be carried out during the development of DRS to test the ideas, concepts, timing and prototypes of the representative of the library users. It is very useful in answering uncertainty in the implementation of DRS. If the library is uncertain about how users will interact on the platform, the library can test the service with library staff before its being launched (Neuman, 2011). At the end of DRS transaction, summative evaluation can be done to evaluate the outcome of the transaction as well as to measure whether DRS has met its objectives and the impact on library users. This can also be used to measure the level of success that has been obtained at the end of DRS implementation. This can be done by comparing it against IFLA's standard (Neuman, 2011).

Before evaluating reference services, libraries must take a decision as to why DRS need to be evaluated and what the library plans to do with the study outcome. (Whitlatch,2001).On a regular basis, academic libraries should conduct a user survey in order to get users' opinions about DRS. The user survey or feedback would help academic libraries to improve the quality of the DRS to determine users' satisfaction. This will help the library to use their resources in providing quality service to ensure user satisfaction (Uutoni, 2014).

2.9.4 Challenges in DRS use

Despite the desirable advantage of digital reference service in libraries, there are a number of challenges that hinder the implementation and management of DRS in academic libraries. Pomerantz and Lou (2006) state that since the integration of DRS in academic libraries, libraries and librarians have become concerned with the issues and challenges associated in the management and implementation of DRS. Many libraries continue to struggle to maintain consistent quality of service for their user populations, to serve and to respond to piles of questions on time. (Wasike, 1999).

Some of these barriers faced by libraries in establishing and DRS in libraries have been identified in Nigeria in a study of Eke and Ekwelem (2014) and Emorjoho (2012) Their finding listed items such as power failure, shortage of web technologies, cost of implementation and network failure. Also, they identified the cost of infrastructure as the major issue. The availability of desktop computers was higher 293 (94%) but Local Area Network (LAN) was the least available infrastructure. This may be attributed to funding and budget cut by library funders. In Nigeria, most reference libraries were not equipped with digital reference facilities and consequently, the staffs were not skilled in the application.

Furthermore, the study of Igun (2005) confirms that there are barriers to the use of digital reference service in libraries. Some workstations may not connect or be able to access digital reference service due to network failures and crashes. Such failures may affect workstations and network drivers after installation. This may be attributed to the unavailability of skilled manpower to maintain and manage the systems after the initial

installation. The problem of electric power fluctuation also constitutes a barrier to growth and sustainable development.

Johnson (1991) avers that in the developing countries, some of the reasons for the failure in the implementation of DRS is insufficient knowledge of hardware and power supply. Also, Yonus (2014) asserts that it is over twenty years since the introduction of computers and internet-enabled equipment in libraries. However, as at now there are some academic institutions which do not have computers. Such a situation will make the implementation of DRS in such institution difficult. For instance, in Pakistan, there are some university libraries, particularly in the public sector, which do not have computers. Such libraries continue to use the traditional method to provide service to clients. In the end, such libraries may not be able to serve a wide range of communities.

Uttoni (2014) also indicates that in Namibia, libraries experience constraints in the provision of feedback to users. She identified that feedback has become one of the challenges in the use of digital reference service. This is attributed to incorrect e-mail addresses, uncompleted questions, among others, owing to this, responses bounce back causing delays in feedback while users wait for their questions to be answered. Sometimes users' queries are not so clear and for that matter, librarians have to follow up to clarify the question. Nevertheless, if the network is slow or down, which happened often, it is difficult to have real-time communication.

Also, there is the inability for libraries to fully reveal certain technical aspects to users for instance, some users find it difficult to search through e-mails. This becomes a worry on the part of users. Moreover, email reference service is very limited in terms of reference interview. This is because answers to reference question take longer to be responded as

compare to questions posed in the chat room, telephone, or by person. Answers sent through email service may take about twenty-four hours to be seen by the library user. An unclear and uncompleted request could take even longer to be answered (Nicholas, 2011).

Another challenge of digital reference services, especially with the use of e-mail service is lack of prompt response. It is difficult for library users to receive prompt responses from librarians; at the same time, librarians also do not have a chance to conduct reference interviews. This is crucial in determining the library users' needs. Another limitation is the difficulty to multitask during a chat reference session. For example, a librarian cannot look for information while chatting online with the user because he or she has to type every word and letter. This makes chat reference much slower than other means of digital reference, it also requires additional reference librarian during busy hours (Kasowitz, 2001).

Smith (2001) explains that it is easy for librarians to misinterpret online reference questions because librarians cannot see facial expressions and gestures or hear the tone of users voice. Although this can be minimized in cases where the library has video chat reference services or other real-time services however, services are only available when reference librarians are at work. Even with the chat reference, distant users would not be able to send reference requests 24 hours a day as they could send on e-mail or web form reference services.

Again, Idan (2017) enumerates some barriers in the use of DRS especially in academic libraries in Ghana. He stated some major challenges in the use of digital reference services especially in the Kwame Nkrumah University of Science and Technology. Issues such as; Frequent power outages, Slow speed of internet, inadequate search skills of users, lack of information communication technology skills on the part of both librarians and staff, low

level of digital reference usage, lack of awareness of digital reference services, poor computing infrastructure, inability to access databases off campus were some challenges affecting the use of DRS.

2.10 Measures to improve DRS in Libraries

In spite of the challenges in the implementation and management of DRS, there are measures that must be in place to improve the service. To begin with, Emojoorho (2012) recommends that academic libraries should have adequate digital facilities for effective reference services. In addition, libraries must refresh staff with orientation, training program, workshops continuous education on digital reference to perform their duties effectively.

Igun (2005) reiterate that the supply of electricity needs to be optimal to enable libraries to provide seamless digital reference service through the internet. Libraries must have reliable power generators as a standby power supply.

Quadri & Abiodun (2017) suggest that libraries should provide students with relevant reference sources, effective library sensitization, and orientation programmes and also employs an innovative reference librarian that has a good customer relationship. There is a need for libraries and librarians to embrace new technologies if they must remain relevant in the face of huge competition.

Yonus(2014) suggests that libraries need to promote digital reference services and also prepare users to accept the digital reference for their queries. The digital reference services must be dedicated to an online librarian, who will only attend to user queries online. The

study also recommends that there is the need to attend to user queries on time in spite of librarians other duties.

Sekyere (2011) also calls upon librarians to progress and advance in knowledge and skills in web technologies in order to design and implement services that would meet the changing needs of library users. Also, Chow and Croxton (2014) suggest that one must consider effectiveness when considering the usability of DRS. This leads to the efficiency of the service and user satisfaction. The point is that users value DRS for its effectiveness that is to say the quality, convenience, speed and efficiency of the DRS.

Ahenkorah-Marfo (2015) also suggests that libraries should embed subject guides within social media pages so as to provide reference services such as 'ask a librarian', chat and instant messaging to promote DRS in academic libraries.

2.11 Chapter Summary

This chapter reviewed related literature pertaining to Digital Reference Service in academic libraries. The review identified some researchers such as Chowdhury (2002), Yonus (2014), Uutoni (2014), Ahenkorah-Marfo(2015) and others in the area of DRS in academic libraries and was done with the aim of finding out other findings in the literature that are relevant to the research.

The review examined the experiences of reference services in library services. Reference service is helping users to locate relevant information from the library or other sources. The concept of DRS was also reviewed. The existence of digital reference service has brought a total transformation in the reference service in academic libraries much that information can be accessed electronically. The review also explored the methods and tools

used for DRS. Both Synchronous (web chat, Ask-A-librarian service, video conferencing and other social media platforms) and Asynchronous (email, web form, chatterbots) methods of DRS are employed in libraries to assist users in their reference queries. Also, the review examined the role of Academic libraries in regards to DRS. Academic libraries plays a major role in creating awareness in the usage of DRS by providing the necessary resources needed for carrying out effective research activities. The Training of librarians was also reviewed in the study. The use of DRS demands a high technical know-how of accessing resources. Enough training should be given to librarians on how to use DRS comfortably. Furthermore, the review investigated the infrastructure and technologies used for DRS. Libraries must develop a good ICT infrastructure for better performance. Again, the study examined the implementation and management of DRS in academic libraries. In the implementation of DRS, libraries must accord DRS the same quality and standards as the traditional reference.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

In this chapter, the various methods that were used to collect and analyse the data were discussed. The section also discussed research design, population, sampling and sampling procedure, instruments for data collection and the data collection procedures and analysis.

3.2 Research Design

According to Bryman (2004) research design is the basic framework outlining the interrelationships between the various studies required in order to effectively address the central stages of a study to ensure that the research questions are addressed. It is a plan which guides the investigator in the process of collecting, analyzing and interpreting observations in a logical model of proof that allows inferences to be drawn concerning the variables under investigation. Cooper and Schindler (2003) assert that research design ensure that the gathered information address the research questions and the objectives

The study adopted mixed method research design. This design was used to gather data to address the research questions. The mixed method research design is a design in which the investigator collects and analyses data, integrate the findings, and draw conclusion using both qualitative and quantitative approaches in a single study (Tashakkori & Creswell, 2007).

One of the characteristics of conducting mixed methods design is the possibility of triangulation, thus, the use of several means (methods, data sources, and researchers) to examine the same phenomenon. Triangulation allows one to recognize aspects of a

phenomenon more accurately by approaching it from different points using different methods and techniques. Successful triangulation needs a careful analysis of the type of information provided by each method, including its strengths and weaknesses” (Creswell, 2012).

The mixed method design emphasis on numbers and words followed up by interviews or observations used as the basis for complementing the questions. Qualitative and quantitative approaches are employed to reinforce each other (Creswell & Plano Clark, 2008). In answering different research questions, a combination of research approaches helps to address a wide range of research questions. By using both quantitative and qualitative approaches, the researcher gains understanding while balancing the weaknesses inherent in using one approach (Creswell, 2012).

The quantitative approach is highly structured which enables the researcher to tackle the exact issues of study. The quantitative approach tends to generalise the findings of the study to the relevant population. The quantitative approach is considered to be difficult and tough but unambiguous due to the precision offered by measurement. The quantitative approach involves uncovering large-scale social trends and the relationship between variables (Bryman, 2008).

Qualitative approach, on the other hand is the process of investigation that draws data from the context in which study occur. In an effort to describe these occurrences, it is a means of determining the process in which events are embedded and the perspectives of those participating in the events, using induction to derive possible explanations based on observed phenomena (Gorman and Clayton, 2005).

The rationale behind the mixed method design is that a single method can be employ to explain the data collected through a different method in a research. For instance, the findings from the interviews can further be explained administering by administering questionnaire with the sample of those filled out the questionnaire in order to gain an understanding of the survey findings (Robson, 2011).

3.3 Selection of Cases

The researcher focused on academic libraries in Ghana where Digital Reference Service (DRS) is used extensively. The researcher focused on the University of Ghana (UG) Balme Library, the Kwame Nkrumah University of Science and Technology (KNUST) Prempeh II Library and the University of Cape Coast (UCC) Sam Jonah Library because there is an impression that these academic libraries are integrating digital reference services in addition to the traditional reference services which enabled the researcher to obtain needed information for the study.

Also, academic libraries were selected because it is easier to access websites for academic libraries than public libraries and special libraries in Ghana. The website provides access to digital information services which enhance data collection. Moreover, these selected libraries were used because it is perceived that they are high in the use of virtual services in answering users' queries outside the library premises.

3.4 Selection of Subjects

3.4.1 Population of the Study

Spata (2003) describes the population as the total aggregation of cases that meet selected criteria. The population for the study consisted of the following groups in the three selected academic libraries in Ghana: DRS users, heads of the library, heads of Information Technology (IT) and DRS Librarians. The target population for the study consisted of the following groups in the three selected academic libraries in Ghana: DRS users, heads of the library, heads of Information Technology (IT) and DRS Librarians.

The researcher obtained and used the DRS user population information between the period of August 2017 to March 2018 (Field Data 2018). Preliminary information indicates that UG has a DRS user population of about seven hundred and thirty-two (732), two (2) DRS Librarians and the head of IT at Balme Library. KNUST has a user population of about six hundred and forty-seven (647), three (3) DRS Librarians and the head of IT. Also, UCC has a user population of six hundred and twenty-one (621), 2 DRS Librarians and the head of IT. Together with the heads of the various selected libraries, the population for the study was two-thousand and thirteen (2013), (Field data, 2018). This can be seen in Table 3.1

Table 3.1 Population of the Study

Academic library	Heads of Library	DRS Librarian	Heads of IT	Users	Total
UG	1	2	1	732	736
KNUST	1	3	1	647	652
UCC	1	2	1	621	625
Total	3	7	3	2000	2013

Source: Field data, 2018

3.4.2 Sample Size

According to Spata, (2003), samples are the individuals selected from the total population of a study to participate in a research. Gay (1996), states that the higher the population the smaller the percentage and if the population size is about 2000, at least 20% is enough to be sampled for the study. The researcher, therefore, chose 20% of the total population of 2000 DRS user for the study. Thus the sample size for the DRS users was 400. In order to obtain the sample size of 400, the researcher chose 20% of the total population of DRS users for each of the three institutions. The researcher chose 20% for the population of 732 to obtain a sample size of 146.4 for DRS users at UG, 20% for the population of 647 to obtain a sample size of 129.4 for DRS users at KNUST and 20% for the population of 621 to obtain a sample size of 124.2 for users at UCC. The sample size for the study was 400. This can be seen in Table 3.2.

Crouch and McKenzie (2006) propose that below 20 participants sustain a close relationship and thus improve a qualitative study. It helps a researcher to build and exchange information to mitigate some of the bias and validity threats inherent in qualitative research. In line with this, the researcher maintained the size of DRS Librarians, heads of Library and IT in the three (3) selected academic Libraries. The sample size for the library professionals and IT heads was 13.

Thus the total sample size for the study was 413. This displayed in Table 3.2.

Table 3.2 Sample Sizes

Academic library	Heads of Library	DRS Librarian	Heads of IT	Users (20%)	Total
UG	1	2	1	146.4	150.4
KNUST	1	3	1	129.4	134.4
UCC	1	2	1	124.2	128.2
Total	3	7	3	400	413

Source: Field data, 2017

3.4.3. Sampling Technique

There are a number of techniques used in research such as simple random sampling method, purposive sampling method, stratified sampling method, convenience sample method among others. Purposive sampling was used to select the Heads of Library, DRS Librarians and IT head for interviews. The researcher believes that they are reliable for the study and can be used for the purposes of the study. The purposive sampling method is likely to produce the most valuable information about the research (Creswell, 1999).

Finally, the researcher stratified the DRS users in the various institutions and employed the convenience sampling procedure. “Convenience sampling is a non-probability sampling technique where subjects are selected because of their convenient accessibility and proximity to the researcher” (Exporable.com, 2009). The convenience sampling method was used to sample individual respondents of DRS users’ from the three institutions. The researcher contacted heads of IT for numbers and emails of users who had used the DRS for their informational needs from August 2017 to March 2018 (Field Data 2018). The researcher then contacted users who were available and willing to answer the research questions.

3.5 Instrumentation

Research instruments are used by researchers to help in the evaluation or assessment of clients. The measurement tools include scales, indexes, interviews and questionnaires surveys. The reliability and validity of a research depend on the type of research instrument chosen (Neuman 2011). The study employed a combination of two data collecting instruments. The main tools for this study were the online questionnaire for users and semi-structured interview for heads of the library, heads of IT and DRS librarians.

3.5.1 Questionnaire

A questionnaire is a set of questions used to generate data necessary to accomplish the objectives of the study. It is a formalized schedule for collecting information from respondents. A questionnaire is a means of drawing out the feelings, beliefs, experiences, perceptions, or attitudes of some sample of individuals. Questionnaire instrument could be structured or unstructured. There are several types of questionnaire such as an online questionnaire, postal or mail questionnaire, a self-administered questionnaire and others. This study used the Google form online questionnaire.

The researcher used the Google form as a means of generating and administering the online questionnaire. Google form provides a fast way to create online questions with responses. It makes work easier by effectively collecting feedback from respondents. This online questionnaire is easy to administer and very convenient for both respondents and the researcher with no interviewer present (Bennett, 2016).

The questionnaire was guided by the research questions and contained open and close-ended questions as well as five (5) point Likert scale in the following order, strongly disagree, disagree, neutral, agree and strongly agree. The close and open-ended questions

enabled the respondents to choose from alternative answers given as well as expressing their views on the topic. This enabled the researcher to cover a broader area for better deductions and analysis.

The online questionnaires were administered to DRS users of UG, KNUST, and UCC. Section A of the questions centered on biographic data of respondents. Section B covered the Reference Services, Section C, was on the level of awareness of DRS, section D, dealt with uses of DRS. Section E, covered Users' view on DRS, Section F was on training, Section G covered management of DRS, Section H was on the challenges in the use of DRS and finally, Section I dealt with ways to improve DRS in the academic libraries. The online questionnaire helped in saving time since information was collected from a large number of respondents from three different institutions within a short time.

3.5.2 Pre-testing of Questionnaires

The success of a research greatly depends on the quality of data that is gathered for the study. A good research design and a representative sample will not guarantee a successful project if the analysis is based on inaccurate data. A pre-test is where a questionnaire is tested on a (statistically) small sample of respondents before a full-scale study, in order to identify any problems such as unclear wording or the questionnaire taking too long to administer (Oppenheim,2000).

The online questionnaire was pre-tested using DRS users of University of Education, Winneba- Winneba campus. This was to help:

- Ensure question comprehension

- Provide relevant answers for respondents
- Test the adequacy of the research instruments
- Assess the feasibility of the full scale study
- Establish whether the sampling frame and technique were effective
- Understand response rates(Kuhn, 2016)

The selection of the University of Education, Winneba- Campus for the pilot study was due to the fact that their library use e-mail as a form DRS to assist patrons and also they have similar setting and mandate to the selected cases for the study. Out of the 120 copies of questionnaire sent, 88 were completed and returned. This gave a response rate of 73%. Suggestions were made per the responses that helped to improve the quality of the questionnaire instrument. Some of the suggestions were that some of the open-ended questions must be restructured to close ended questions. The questionnaire was therefore improved on the basis of the pilot study.

3.5.3 Interview

Interview is a flexible design employed as the only method or together with other methods to gather data for the research. It allows new ideas to be brought up during the interview as a result of what the interviewee says leading to follow-up questions. The semi-structured interviews with the help of an interview guide were used to gather qualitative data for this research. The interview guide allowed some amount of control over the interview. Also, it was a checklist that ensured that all the participants have answered all the questions relating to study (Robson, 2011). It is generally beneficial for interviewers to have an interview guide prepared. Interview guide helps researchers to focus on the topics at hand without restraining them to a particular format (Edward & Holland, 2013).

The semi-structured interviews are appropriate when a quantitative study has been undertaken and qualitative data are required to clarify and illustrate the meaning of the findings of the quantitative study. The semi-structured interviews enable the interviewees to develop ideas and speak more widely on different issues related to a research topic. It also lays emphasis on the interviewees' points of view (Descombe, 2003). Bryman (2008) posits that, the semi-structured interviews could be used alongside other methods as a way of supplementing their data. They are probably the most flexible data collection tool as they provide interviewees the opportunity to express their views, expand their ideas and identify important issues about a research topic. They help to obtain rich and detailed information about the research and also lay some emphasis on the formulation of initial research ideas.

The semi-structured interviews were used for the heads of the library, heads of IT and DRS librarians. The decision to conduct interviews with library and IT heads together with the DRS librarian were made on the basis that the heads of the library are well aware of library policies, practices, different aspects pertaining to the management of DRS and issues affecting the management of DRS in their respective libraries. Furthermore, the heads of the three libraries were interviewed to confirm or deny what the DRS librarians and IT staff said. The DRS librarians were not capable of providing information on implementation and management hence, the need to interview heads of IT with regards to implementation and management responsibilities as well as procedures of DRS.

The interview was semi-structured under themes. Section A of the questions centered on biographical data. Section B covered the Reference Service, Section C was also on the level and awareness of the use of DRS. Section D was on Librarians view, Section E covered

training, section F covered infrastructures used for DRS, while Section G covered the challenges in the implementation and management of DRS. Section H was on ways to improve DRS in libraries.

These instruments were adopted for the study because they were the best means of achieving the objectives of the qualitative and quantitative study (Zikmund, 2003).

3.6 Data Collection Method

Primary and secondary sources were used in the collection of data. The primary sources included the use of a structured questionnaire and interviews. Secondary sources include the use of books, journal articles, usage reports of databases and other related works. The questionnaires were administered separately from and the interviews.

Data can be collected using different approaches. These include live administration, administration by telephone, Internet-mediated, e-mail, and face-to-face and among others. (Fraenkel & Wallen, 2008). The researcher in consultation with IT heads acquired email and telephone numbers of DRS users of the various institutions. The researcher generated the questionnaire using Google forms. Different URL links to the questionnaire were generated from Google form for the three institutions in order to obtain varied responses from each institution. The URL links were sent to respondents through WhatsApp and e-mails to answer the questions. The researcher introduced the subject to the respondents who answered the research questions online.

These were respondents who were available and were willing to answer the research questions. The questionnaires were distributed to the target samples until the required number was obtained. Section A of the questionnaires focused on the demographic characteristics of respondents while the other sections consisted of items that addressed the objectives of the study.

The one-on-one interview was scheduled with the heads of the library, DRS librarians, and heads of IT. The interviews were structured under themes. Section A covered the Demographic characteristics of respondents and the rest of the section addressed the objectives of the study.

3.7 Data Analysis Procedure

Descriptive statistics such as frequencies and percentages were used to discuss the findings in relation to research questions and objectives of the study. After the research data were collected, they were edited to ensure adherence to the data collection protocol and avoided actions that led to missing and questionable data. The data from the questionnaires were organized, categorised, edited, and analysed using simple percentages, tables, and graphs for discussions based on the research questions and the objectives of the study. The Google form tool was used for the analysis of the questionnaires. This tool was employed because the tool can be used to collect, analyse and organize data (Bennett, 2016). The interviews were transcribed qualitatively using the thematic content analysis based on the research question and objectives of the study.

3.8 Ethical Consideration

Regardless of the approach to research, a researcher faces many ethical issues that surface during data collection in the field and in analysis and dissemination of reports (Creswell, 2007). A letter from the researcher's department (Department of Information Studies) was sent to the three academic libraries seeking permission to conduct the study. The research explained the purpose of the study to the respondents and there was no form of deception about the nature of the study and the confidentiality of respondents was protected. Also, all consulted literature and articles were duly acknowledged. Finally, the researcher adhered to all the codes of ethics relating to graduate research in the University of Ghana, Legon.

3.9. Chapter Summary

This chapter focused on the research methods and methodology used in the study. The study employed the mixed method design. Thus, qualitative and quantitative methods were combined to collect and analyze data. Google form online questionnaire administration and face-to-face interviews were used in collecting data for the study. Also, purposive sampling was used to collect qualitative data while convenience sampling was used to collect quantitative data.

CHAPTER FOUR

DATA ANALYSIS AND FINDINGS

4.1 Introduction

This chapter presents the findings of the study obtained from the questionnaires and interviews. The findings reflected the methodological approach of mixed methods. The data analysis was thus presented in two parts – quantitative and qualitative components.

4.2 Quantitative Analysis and findings

Data from the questionnaire have been analysed and presented under themes. Descriptive statistics with Tables and graphs showing frequencies and percentages were used to support the analysis. Further, the 5 Point Likert scale was interpreted as follows; 1-strongly disagree 2- disagree, 3-neutral(undecided), 4- agree and 5-strongly agree. Weighted averages were calculated to show the tendency towards agree, neutral, and disagree.

4.2.1 Response Rate

The respondents comprised DRS users from three academic institutions in Ghana. Online questionnaires were distributed to four hundred (400) participants via WhatsApp and email to DRS users from the three selected institution; the University of Ghana, Legon (UG), Kwame Nkrumah University of Science and Technology (KNUST) and University of Cape Coast (UCC) (See Appendix 1). One hundred (100) out of 146 online questionnaires administered to respondents from the University of Ghana was fully completed. This represented 36.5% of the total respondents. Respondents from the Kwame Nkrumah University of Science and Technology returned 102 out of 130 completed online questionnaires and this represented 33.15 % of the total respondents.

The University of Cape Coast returned 98 out of 124 online questionnaires representing 30.28% of the total respondents. In all, 300 questionnaires were fully completed giving a response rate of 75%. According to Babbie (2008), a response rate of 70% is very good for analysis and reporting. Therefore, a response rate of 75% is a very good rate for the study.

4.2.2 Background information

The gender, respondents' category, profession and level of education of respondents that took part in the study have been represented in Table 4.1

Table 4. 1 Demographical Data of Respondents

Variables	Freq.	(%)
Gender		
Female	160	53.3
Male	140	46.7
Category of users		
Student	260	86.7
Private users	30	10
Faculty	10	3.3
Profession		
Students	260	86.7
Faculty	10	3.3
Researcher	10	3.3
Teacher	9	3.1
Medical officer	7	2.3
Banker	4	1.3
Level of Education		
Tertiary	300	100
Total	300	100

Source: Field data, 2018

From Table 4.1, out of the 300 respondents, 160 (53.3%) were females while 140 (46.7%) were males. Observably the female respondents were more than the male respondents but the differences were not much. Respondents category of participants in the study were captured under three categories, Respondents who were students from the three institutions constitute 260 (86.7%), 30 (10%) were private users while 10 (3.3%) were faculty members. It was observed that the student respondent category answered the research question more than the other categories. A follow up question was asked to inquire about the profession of respondents, 260 (86.7%) were students, 10 (3.3%) were faculty members, 10 (3.3%) were also researchers, 9 (3%) were teachers, 7 (2.3%) were medical officers, while 4 (1.3%) were bankers. This indicated that respondents were from various professions. With their level of education, all the respondents 300 (100%) had completed tertiary. The study revealed that the majority of DRS users were students.

4.2.3 Level of awareness and use of DRS

This question sought to inquire about reference service, types of DRS, the level of awareness and use of DRS in the three institutions.

4.2.3.1 Reference Service

The researcher probed from users the channels of reference service used for reference questions in their libraries. The researcher asked respondents to indicate whether they use Traditional Reference Service (TRS), Digital reference service (DRS) or both services. The result is found in Table 4.2.

Table 4.2 Chanel of Reference Services used for Queries

Variable	UG		KNUST		UCC		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
TRS	30	10	20	6.7	20	6.7	70	23.3
DRS	20	6.7	20	6.7	20	6.7	60	20
Both TRS and DRS	62	20.7	50	16.7	58	19.3	170	56.7

Source: Field data, 2018

In Table 4.2, the total respondents who used the TRS constituted 70 (23.3%), 60 (20%) used DRS for their reference queries while 170 (56.7%) used both the traditional face-to-face and DRS for reference questions. It can be said that users from the three institutions used both DRS and traditional reference service for their reference queries. Comparatively, among the three institutions, users from UG 62 (20.7%) used both TRS and DRS than all the other two institutions.

The researcher further asked respondents to indicate their preferred reference services. The responses are seen Table 4.3

Table 4.3 Preferred Reference Service

Variable	UG		KNUST		UCC		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
TRS	50	16.7	70	23.3	50	16.7	170	56.7
DRS	50	16.7	32	10.7	48	16	130	43.3

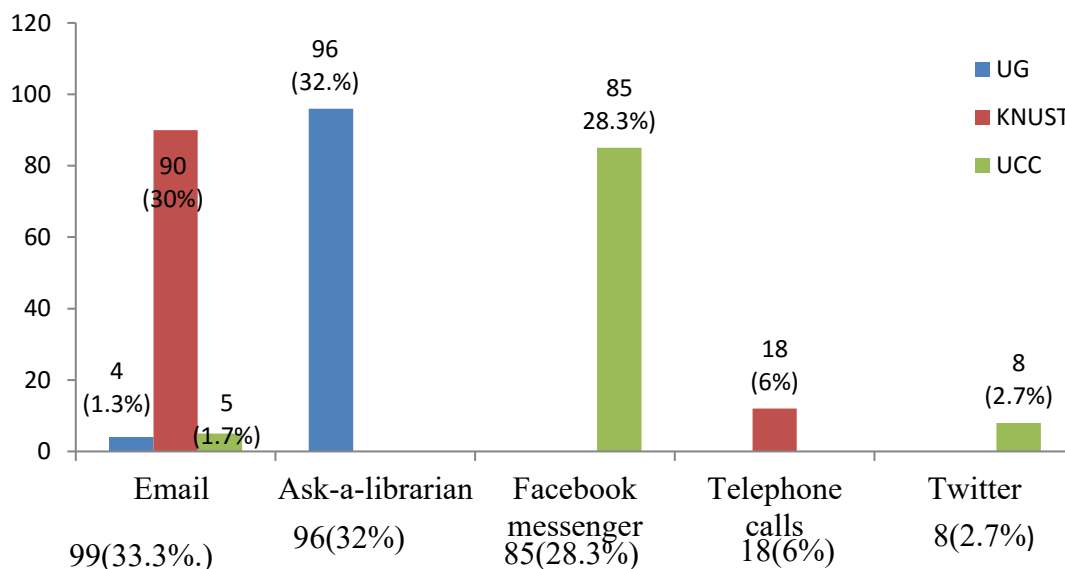
Source: Field data, 2018.

In Table 4.3, more than half of the total respondents 170 (56.7%) preferred TRS to DRS 130(43.3%). Although users used both TRS and DRS for reference queries, however, they preferred TRS for reference queries especially respondents from KNUST 70 (23.3%) followed by UG 50 (16.7%) and UCC 50 (16.7%).

4.2.3.2. Types of DRS Platforms used in Libraries

The researcher asked users to indicate the DRS platform they preferred in asking their reference questions. The responses are depicted in Figure 4.1.

Figure 4.1 Preferred DRS platform



Source: Field data, 2018

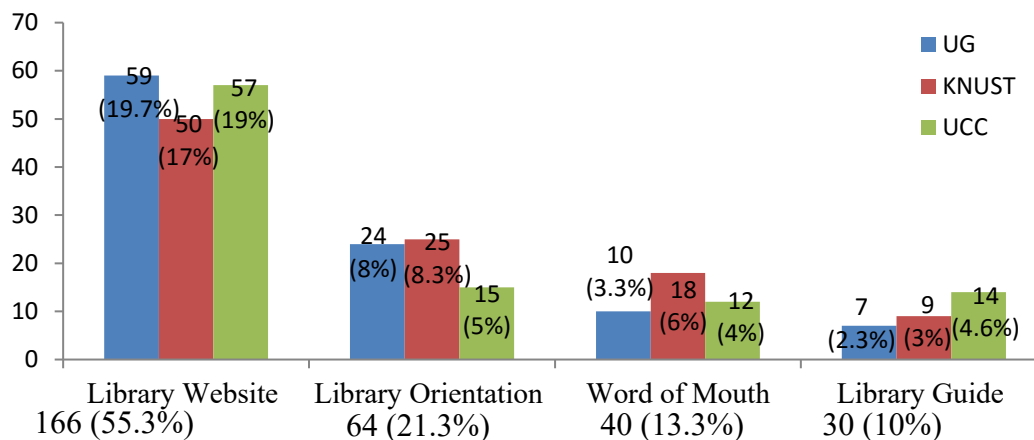
Figure 4.1 revealed that the total respondents of 99 (33%) preferred email for their reference questions. 90 (30%) preferred Ask-a-librarian mainly for UG users, at UCC, 85 (28.3 %) and 14 (4.7%) users used Facebook messenger and Twitter handle respectively, whereas 12 (4%) used telephone calls at KNUST. However, none of the institutions used

text messages. It was found that the three libraries used different types of DRS at their libraries; however, email was a common DRS platform among the three institutions. KNUST 90 (30%) used email reference services than all the three institutions.

4.2.3.3 Level of Awareness

The researcher asked respondents how they got to know about DRS. It was discovered from the study that, respondents got to know about DRS from the library’s website. The results are represented in Figure 4.2.

Figure 4.2 Channel of Awareness



Source: Field data, 2018

From the Figure 4.2, more than half of the total respondents 166 (55.3%) got to know about DRS via the library website, 64(21.3%) got to know about DRS during library orientation, 40 (13.3%) was by word of mouth, while 30 (10%) got to know from the library guide. This indicated that library website plays a role in creating awareness in the use of DRS and users of UG 59 (19.7%) recorded the highest response, followed by UCC 57 (19%) and KNUST 50 (17%).

Additionally, the researcher asked users about the place of access. The responses is seen in Table 4.4

Table 4.4 Place of Access

Variable	UG		KNUST		UCC		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
On-campus	35	11.7	45	15	55	18.3	135	45
Off-campus	65	21.7	58	19.3	43	14.3	165	55

Source: Field data, 2018

From Table 4.4, it was recorded that more than half of the total respondents 165 (55%) access DRS off-campus, while the rest 135 (45%) accessed DRS on-campus. This revealed that it is possible to access DRS off-campus. Among the three institutions the highest respondents on the above question were from UG 65 (21.7%), followed by KNUST 58 (19.3%) before UCC 43 (14.3%).

The researcher further asked users if they could get access to DRS after library closing hours. This can be seen in Table 4.5.

Table 4.5 Access to DRS after Library Hours

Variable	UG		KNUST		UCC		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
No	50	16.7	70	23.3	50	16.7	200	66.7
Yes	50	16.7	32	10.7	48	16	100	33.3

Source: Field data, 2018

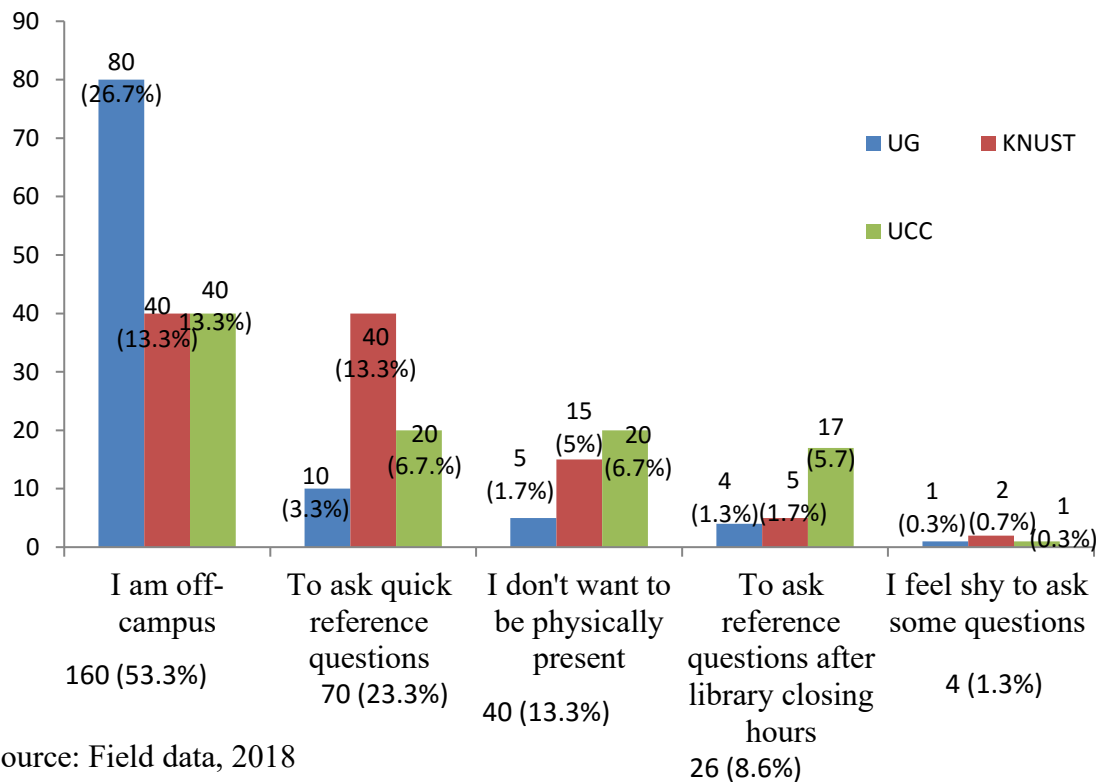
Table 4.5 depicted that, the majority of the total respondents, 200 (66.7%) indicated 'no' while 100 (33.3%) said 'yes' they had access even after library closing hours. Majority of

the respondents had no access to DRS after library hours especially in KNUST 70 (23.3%). This means that DRS were inactive after library hours.

4.2.3.4 Use of DRS

The researcher further asked users why they prefer to use DRS for their reference question. It was found that respondents used DRS because they were off campus. The result is displayed in Figure 4.3.

Figure 4.3 Reasons for using DRS



From Figure 4.3, a total respondents of 160 (53.3%) responded that they used DRS because they were off campus with the highest respondents from UG 80 (26.7%), 70 (23.3%) to ask quick reference questions, 40 (13.3%) did not want to be physically present in the library, 26 (8.6%) used it to ask reference questions after library closing hours, while 4 (1.3%)

used DRS because respondents felt shy to ask face-to-face questions. It can be said that more than half of the respondents used DRS off-campus especially in UG 80 (26.7%).

The researcher further asked users how often they used DRS for their queries. The result is displayed in Table 4.6

Table 4.6 Frequency of use of DRS

Variable	UG		KNUST		UCC		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Occasionally	40	13.3	30	10	40	13.3	110	36.7
Regularly	30	10	34	11.3	30	10	94	31.3
Once a while	20	6.7	30	10	20	6.7	70	23.3
Rarely	10	3.3	8	2.7	8	2.7	26	8.7

Source: Field data, 2018

Table 4.6 revealed that a total respondents of 110 (36.7%) answered they use DRS occasionally, 94 (31.3%) responded regularly, 70 (23.3%) responded once a while, whereas 26 (8.7%) responded rarely. This indicated that users use DRS occasionally especially in UG 40 (13.3%) and UCC 40 (13.3%).

Moreover, the researcher asked users about the medium of access for DRS. The result is displayed in Table 4.7.

Table 4.7 Medium of Access

Variable	UG		KNUST		UCC		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Mobile phone	50	16.5	40	13.3	70	23.3	160	53.3
Laptop	30	10	30	10	14	4.6	74	24
Tablet	20	6.7	32	10.6	14	4.6	66	22

Source: Field data, 2018

Table 4.7 indicated that more than half of the total respondents 160 (53.3%) used the mobile phone to access DRS, 74 (24.7%) accessed with the laptops while 66 (22%) used Tablets to access DRS. Hence, mobile phones were usually used to access DRS especially DRS users from UCC 70 (23.3%).

The researcher further inquired from users their purpose of using DRS. The result is displayed in Table 4.8.

Table 4.8 Purpose of using DRS

Variable	UG		KNUST		UCC		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Research consulting	15	5	38	12.7	57	19	110	36.7
Readers advisory service	40	13.3	40	13.3	20	6.7	100	33.3
Ready reference	40	13.3	22	7.3	18	6	80	26.7
Instructions	2	0.7	1	0.3	2	0.7	5	1.7
Bibliographic verification	1	0.3	1	0.3	1	0.3	3	1
Interlibrary loan	2	0.7	0	0	0	0	2	0.7

Source: Field data, 2018

From Table 4.8, more than one-third the total respondents 110 (36.7%) used DRS for research consulting, 100 (33.3%) used it for advisory service, while 80 (26.7%) used it for ready reference question, 5 (1.7%) used it for instructions, 3 (1%) used it for Bibliographic verification while 2 (0.7%) used it for interlibrary loan. Users use DRS for research consulting and among the three institution DRS users from UCC 57 (19%) mostly used DRS for research consulting.

4.2.4 Users' view on DRS.

The researcher basically sought to find out the views of users, their experiences on DRS, feedback, satisfaction, and usefulness of DRS.

4.2.4.1 Users' View on DRS

The researcher asked users if DRS must be replaced, integrated or separated from traditional reference services (TRS). The responses are shown in Table 4.9

Table 4.9 TRS VRS DRS

Variable	UG		KNUST		UCC		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Replace	10	3.3	8	2.7	10	3.3	28	9.3
Integrated	10	3.3	50	16.7	11	3.7	71	23.7
Separate	80	26.7	44	14.7	77	25.7	201	67

Source: Field data,2018

It emerged from Table 4.9 that, majority of the total respondents 201 (67%) answered that, DRS must be separated from the traditional reference service, 71 (23.7%) was of the view that both reference service must be integrated whiles 28 (9.3%) asserted that DRS must replace traditional reference service. For this reason, most respondents especially from UG 77 (25.7%) preferred DRS to work separately from the traditional reference service.

The researcher sought to inquire from users about their experiences on DRS. Users were asked if they were able to clarify their questions on DRS. The result is found in Table 4.10

Table 4.10 Users' Ability to Clarify themselves on DRS

Variable	UG		KNUST		UCC		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Yes	60	20	60	20	78	26	198	66
No	40	13.3	42	14	20	6.7	102	34

Source: Field data, 2018

Table 4.10 depicted that, more than half of the total respondents 198 (66%) said 'yes' they were able to clarify their questions on DRS while the rest 102 (34%) indicated 'no' that they found it difficult expressing themselves. Reasonably, respondents were able to clarify themselves on DRS more especially UCC 78 (26%) users.

Again, respondents were asked if they received prompt responses to their question on DRS.

The result is displayed in Table 4.11

Table 4.11 Prompt Response on DRS

Variable	UG		KNUST		UCC		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
No	80	26.7	50	16.7	58	19.3	188	62.7
Yes	14	3.3	48	16	30	10	92	30.7
Not All times	6	2	4	1.3	10	3.3	20	6.7

Source: Field data, 2018

From Table 4.11, more than half of the total respondents 188 (62.7) indicated 'no', 92 (30.7%) said 'yes' they received prompt answers whereas the rest 20 (6.7%) indicated not all times. More than half of the respondents did not receive prompt responses and this was reflective in the responses of UG 80 (26.7%) users.

The researcher followed up on the question to ask how long it takes for questions to be answered. This is shown in Table 4.12.

Table 4.12 Duration of Responses on DRS

Variable	UG		KNUST		UCC		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Typically a day	30	10	40	13.3	47	15.7	117	39
Week	30	10	30	10	37	12.3	97	32.3
Hours	20	6.7	30	10	6	2	56	18
1-30minutes	20	6.7	2	0.7	8	2.7	30	10

Source: Field data, 2018

The result of Table 4.12 revealed that a total respondents of 117 (39%) indicated that it takes typically a day for their reference questions to be answered, 97 (32.3%) indicated that it takes a week, 56 (18.7%) indicated hours while the rest 30 (10%) said 1-30minutes. From the study, it took typically a day for questions to be answered on DRS especially at UCC while the shortest response duration takes 1-30minutes from UG 20 (6.7%).

Also, respondents were asked about their satisfaction with the feedback received on DRS.

The result is represented in Table 4.13.

Table 4.13 Satisfaction of Feedback Received from DRS

Variable	UG		KNUST		UCC		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Satisfied	40	13.3	20	6.7	60	20	120	40
Not Satisfied	20	6.7	20	6.7	20	6.7	60	20
Somehow satisfied	42	14	60	20	18	6	120	40

Source: Field data, 2018.

The result from Table 4.13 indicated that a total respondents of 120 (40%) were satisfied, while the same number 120 (40%) said they were somehow satisfied and 60 (20%) were

not satisfied with the feedback given. This means that generally, users were satisfied especially UCC 60 (20%) users.

A follow-up question was asked if respondents had ever been referred to other sources of information to answer their questions. The result is displayed in Table 4.14.

Table 4.14 Reference to other sources

Variable	UG		KNUST		UCC		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Yes	85	28.3	71	23.7	90	30	246	82
No	15	5	31	10.4	8	2.7	54	18

Source: Field data, 2018.

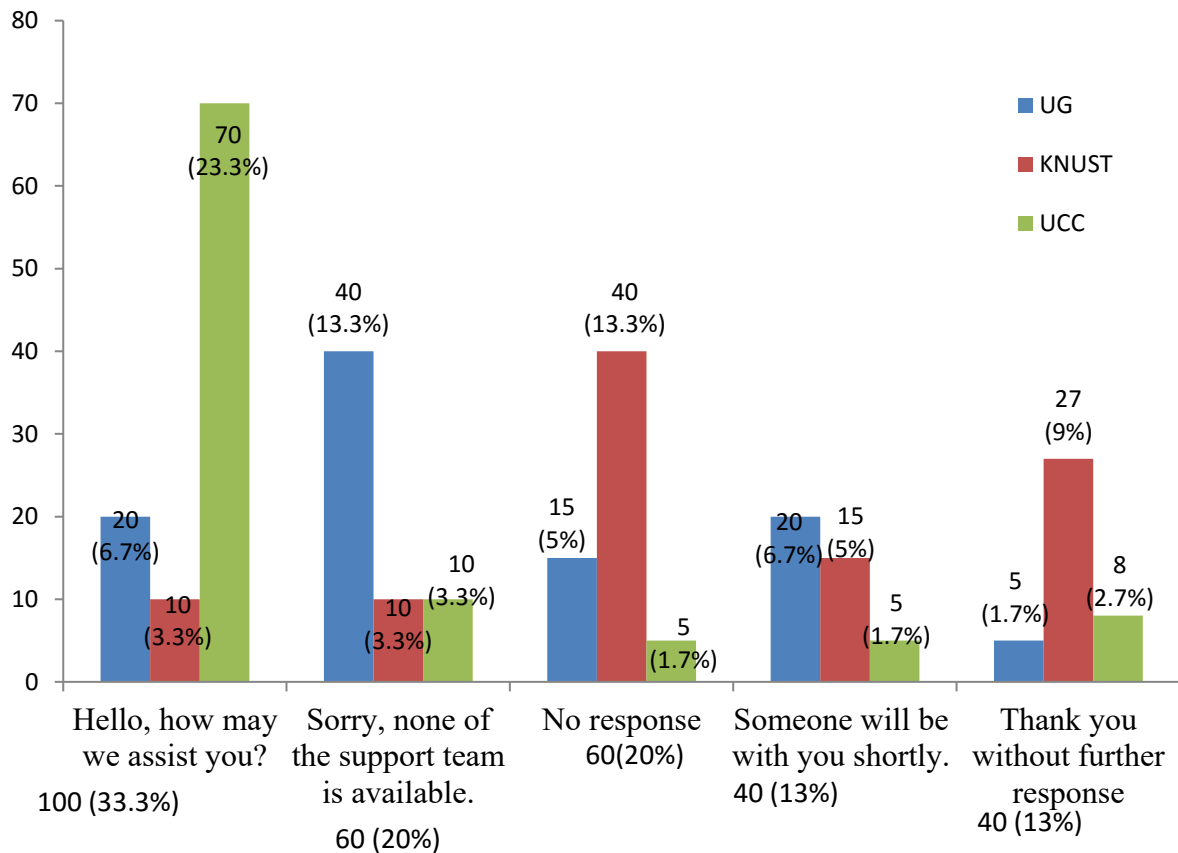
It emerged from Table 4.14 that, the majority of the total respondents 246(82%) said 'yes' they have been referred to other sources while 54 (18) indicated 'no' to the question. From the results, many users from UCC 90(30), followed by UG 85 (28.5%) before KNUST 71 (23.7%) had been referred to other sources to answer their questions.

Moreover, the researcher asked respondents if they had been referred to other libraries outside their institution for assistance. All the total respondents 300(100%) answered 'no' to the question.

In addition, the researcher further asked respondents the first response they usually received from the library to demonstrate approachability to acknowledge users online.

One-third of the respondents received ‘Hello how may we assist you?’ as the first message received from the library. This is presented in Figure 4.4.

Figure 4.4 First Response received from DRS

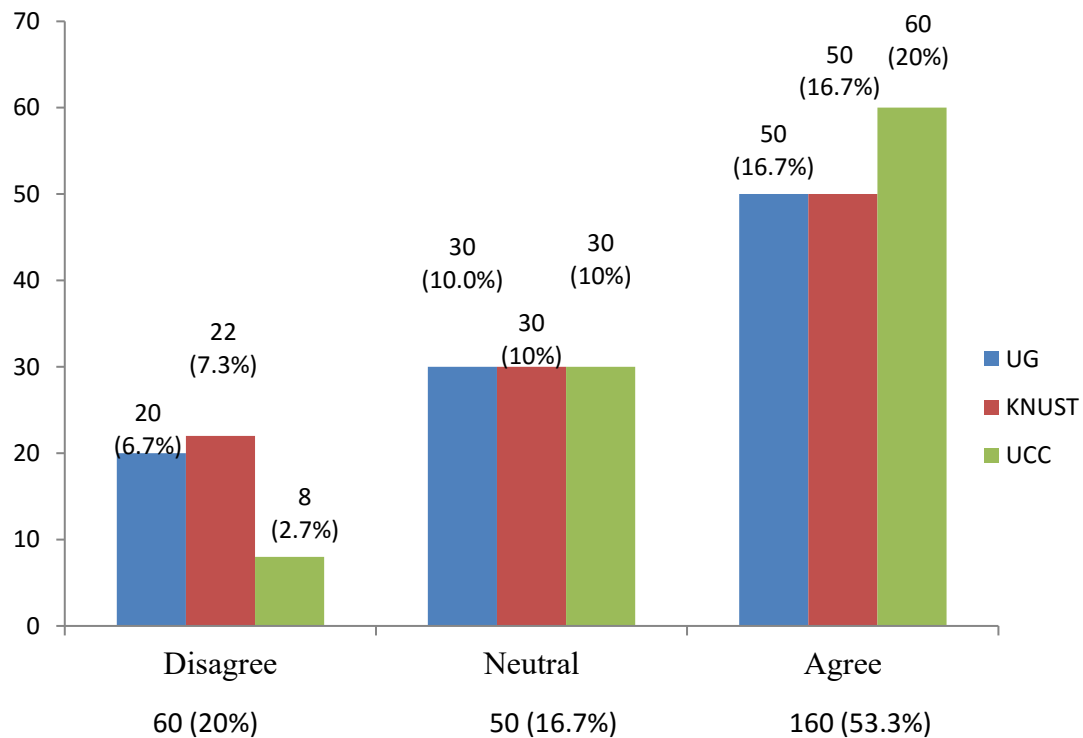


Source: Field data, 2018

From Figure 4.4, a total respondents of 100(33.3%) received ‘hello how may we assist you?’ 60 (20%) received ‘sorry, none of the support team is available’ another 60 (20%) also received ‘no response’ 40 (13.3%) respondents received ‘someone will be with you shortly’ as response, yet another 40 (13.3%) received ‘thank you, without further response’. This means a particular welcoming message is familiar on UCC DRS platforms.

The study further asked respondents if the existence of DRS have increased the use of library services. The responses can be seen in Figure 4.5.

Figure 4.5 Influences of DRS on Library Service

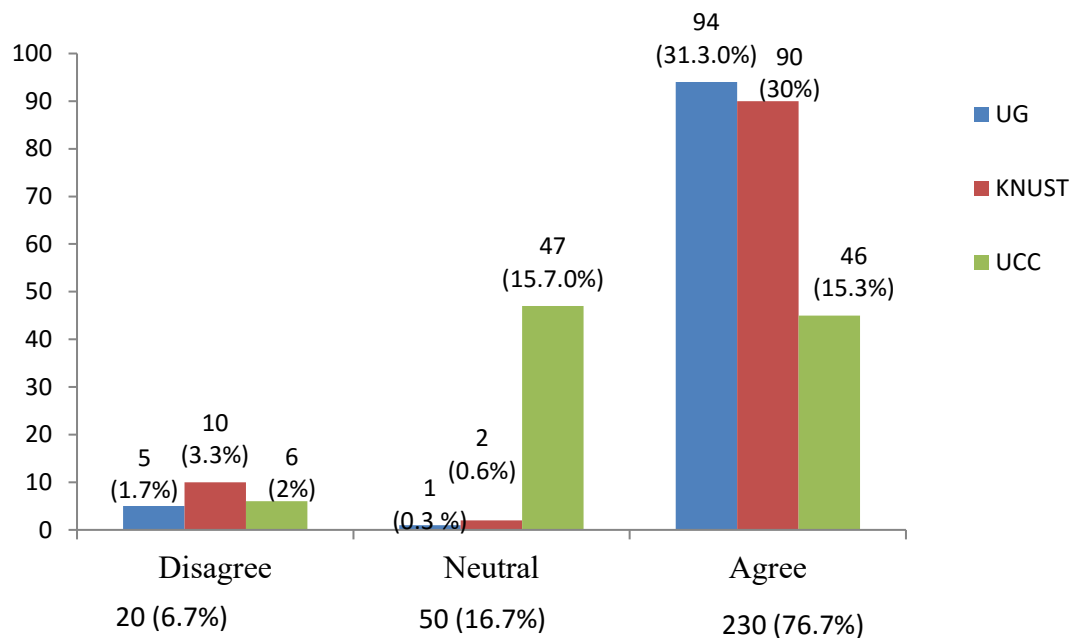


Source: Field data, 2018

From Figure 4.5, the total respondents who agreed to the question were more than half of the respondents representing 160 (53.3%), 50 (16.7%) disagreed to the question while the rest 90 (30%) were undecided. Respondents from UCC agreed with the highest response rate of 60 (20%).

The researcher probed to find out from respondents about the usefulness of DRS. It was revealed that respondents strongly agreed that DRS was useful. This can be seen in Figure 4.6.

Figure 4.6 Usefulness of DRS



Source: Field data, 2018

It can be seen from Figure 4.6, that majority of the total respondents 230 (76.7%) agreed that DRS is useful, 50(16.7%) were undecided about this whiles 20(6.6%) disagreed. This implies that DRS were very useful to users especially in UG 94(31.3%).

4.2.5 Training on DRS

The researcher sought to find out from respondents if they undergo training on DRS.

Respondents were asked if they were taught how to use DRS. All the total respondents 300 (100%) respondents answered ‘no’ to the question. This meant that all respondents were not taught how to use DRS.

Further, it was inquired from respondents if they had undergone any training in the use of DRS, similarly, all the total respondents 300 (100%) respondents answered ‘no’. This indicated that, users are not trained on how to use DRS.

4.2.6. Challenges related to the implementation and management of DRS

Research Question four is to find out from respondents if they had the chance to evaluate DRS after transactions and the challenges they faced in the use of DRS.

4.2.6.1 Evaluation of DRS

To improve the quality of a service, there is a need for assessment to make the necessary adjustment. Respondents were asked if they were given user feedback survey to assess DRS at the end of every transaction. All the total respondents 300(100%) respondents from the three institutions answered “no”. this means there were no forms of evaluation of DRS among the three institutions.

Further, they were asked if they were allowed to rate DRS at end of the transaction, yet the answer remained ‘no’ from the three institutions. It can be concluded that there were no means of assessing users’ feedback.

4.2.6.2 Challenges of DRS

This question also sought to ask respondents if they had internet challenges in accessing DRS. This is shown in Table 4.15

Table 4 .15 Internet Challenges

Variable	UG		KNUST		UCC		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
No	85	28.3	71	23.7	90	30	246	82
Yes	15	5	31	10.4	8	2.7	54	18

Source: Field data, 2018

From Table 4.15, a total respondents of 246 (82%) said ‘no’ to the question whiles the rest 54 (18%) said ‘yes’ they have internet challenges. Majority of the respondents in the study had no internet challenge in the use of DRS especially UCC 90 (30), then UG 85 (28.3%) before KNUST 71 (23.7%).

This was followed up by a question that asked respondents if they have challenges in the way the library answered their question. The results can be seen in table 4.16

Table 4 .16 Challenges in feedback

Variable	UG		KNUST		UCC		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Some times	60	20	50	16.7	70	23.3	180	60
Yes	35	11.7	35	11.7	10	3.3	80	26.7
No	5	1.7	17	5.6	18	6	40	13.3

Source: Field data, 2018

From table 4.16, more than half the total respondents 180 (60%) affirm that sometimes they had challenges, 80 (26.7%) said ‘yes’ they had challenges while 40 (13.3%) said ‘no’ they don’t face any challenge with the way the library answered their queries. This means users especially in UCC 70 (23.3%), followed by UG 60 (20%) then KNUST 50 (16.7%) do not always have challenges with the kind of feedback given to users

Also, the researcher inquired from the respondents about the challenges they faced using DRS. The results can be seen in Table 4.17.

Table 4.17 Challenges in the use of DRS

Variable	UG		KNUST		UCC		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Inactivity after library hours	40	13.3	70	23.3	20	6.7	250	83.3
Lack of prompt response	70	23.3	40	13.3	20	6.7	130	43.3
Unsatisfactory response	5	1.6	4	1.3	5	1.6	14	4.6
Internet challenge	2	0.6	2	0.6	2	0.6	6	2

N=Multiple Responses

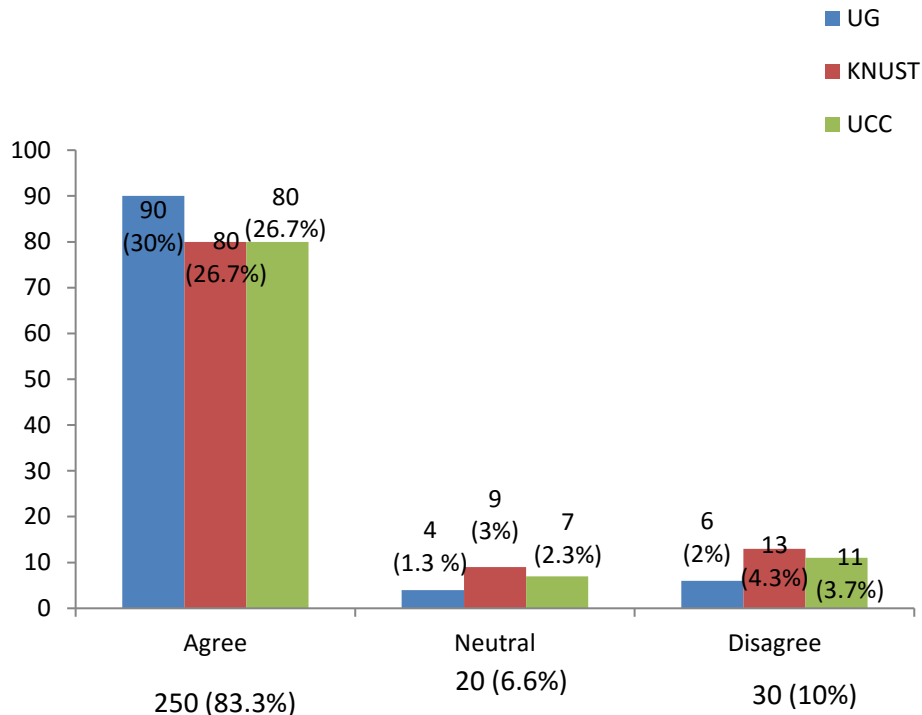
Source: Field data, 2018

From Table 4.17, half of the total respondents 250 (83.3%) said DRS was inactive after library hours, 130 (43.3%) did not receive prompt responses from the library, 14 (4.6%) indicated responses were not satisfactory while 6 (2%) indicated poor internet connectivity as their challenges. This indicated that one of the barriers to the use of DRS was the inactivity of DRS after library hours especially at KNUST 70 (23.3%)

4.2.7 Suggestions and Recommendations

The researcher asked respondents if DRS were recommendable. A larger number agreed to the question. The result is depicted in Figure 4.7.

Figure 4.7 Recommendation of DRS by users



Source: Field data, 2018

From Figure 4.7, a total respondents of 250 (83.3%) agreed that DRS was recommendable, 30 (10%) disagreed whiles the rest 20 (6.6%) were undecided. Majority of the respondents agreed that they will recommend DRS to others. The highest respondents who agreed to the question were from UG 90 (30%).

Again, the researcher asked respondents to suggest ways to improve DRS. The result is depicted in Table 4.18.

Table 4.18 Ways to improve DRS

Variable	UG		KNUST		UCC		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Extend DRS time after library hours	60	20	70	23.3	20	6.7	150	50
	70	23.3	20	6.7	10	3.3	100	33.3
Prompt response								
Collaborative network with other libraries	2	0.7	18	6	10	3.3	30	10
Improve internet connectivity	0	0	10	3.3	10	3.3	20	6.7

N=Multiple responses

Source: Field data, 2018

Table 4.18 indicated the suggestions made by institutions and a total respondents of 150 (50%) indicated that there must be extended DRS time after library hours to improve the use of DRS, 100 (33.3%) said librarians must give prompt responses, 30 (10%) said there must be a collaborative network with other libraries while 20 (6.7) indicated that internet connectivity must be improved. This revealed that users expected extended DRS time after library hours especially users from KNUST 70 (23.3%).

4.3 Qualitative data analysis and findings

Respondents of the questionnaires were not in a position and hence were not capable of providing information pertaining to management and implementation of DRS. There was the need, therefore, to complement data from the questionnaires with data from interviews with regards to oversight responsibilities and procedures in the management of DRS.

The researcher sought to conduct interviews with Heads of the library, DRS librarians and heads of IT at the three institutions. The interviews were intended to complement the questionnaire to determine their views on digital reference service. In order to achieve this, face-to-face and telephone interviews were conducted.

There were thirteen (13) interviews in all, nine (9) were conducted in the offices of interviewees in their libraries and the rest four (4) were conducted by telephone calls. All interviews were audio-recorded and therefore were unidentified. In order to maintain the privacy of responses, the biographical data on respondents with regards to their names and some personal information was not recorded. The interviews gave very vital qualitative results. The highlighted quotation in the study is not linked with respondents, only the ideas and opinions were analyzed as data. The interviews were transcribed under research question.

The interviews were conducted personally with three(3)Heads of Library and seven(7) DRS librarians and three(3)heads of Information Technology (IT) of the selected institutions by the researcher with the use of semi-structured interview guide(see appendix 2, 3and 4). The interviews were transcribed under the research question.

4.3.1. Background

Out of the thirteen (13) DRS librarians, 3 were females while 10 were males. This showed that the male librarians who were interviewed were more than female librarians in the three institutions. Eight (8) of the library staff had worked for 5-10 years in the library while 5 had worked for more than 10 years in the library. This indicated that more of the library staff had worked for 5 years and more. Seven (7) of the DRS librarians were professional librarians, while three (3) were para-professionals and three (3) were Heads of IT.

4.3.2. Level of awareness and use of DRS

The researcher found out from participants about reference service, the channel of reference service, DRS platforms used and the level of awareness and use of DRS in the three institutions.

4.3.2.1. Reference Service

The researcher inquired about the channel of reference services in the three libraries. All the three libraries used both digital reference and traditional reference services to assist users. According to the DRS librarians at the three institutions, some users preferred the traditional reference service while others also preferred to use the DRS.

4.3.2.2. Types of DRS

This question sought to find out from the participants about the types of DRS provided in the three libraries. Some respondents indicated asynchronous, others used synchronous whereas others used both forms.

This question was followed up by asking participants about the DRS platforms in the three libraries. All the involved libraries used at least two platforms for their digital reference service. The email was the common DRS platform among the three institutions; also UG was the only institution with Ask-a-Librarian service. It was revealed that KNUST used the email platform and telephone calls. Formally KNUST operated the text message services but currently the service was unavailable. UCC used the Facebook messenger and Twitter handle. Moreover, participant librarians pointed out that the preferred DRS platform was based on the availability of that particular DRS in the institution.

4.3.2.3 Level of Awareness

Among the three institutions, at least 2 library professionals were in charge of DRS in the libraries. It was revealed by one of the institutions that DRS was supposed to be managed by all senior members of the library but only 2 staff were willing to manage the DRS.

One participant did not understand why DRS platforms were available in libraries but no staffs were willing to interact with users. Another who could not hide his intentions also had this to say:

“If we establish the DRS platform and there is none to use it ... then there is no need for implementing it. The only thing is to get somebody to interact with patrons”.

Participants indicated that quite a lot of users were aware of DRS. It was revealed that DRS was marketed through their institutional websites, during orientations, training programmes, flyers and posters were used to create awareness among users. One of the participants in one of the institution had this to say about awareness creation:

“The library does a lot of publicity on DRS. The library website, orientation and training programmes...”

Participants revealed that DRS can be accessed on-campus and off-campus. This was affirmed by a participant as follows:

“DRS saves students time and energy used for coming to the library. On-campus and non-residence students may not have to travel all the way to the library...”

The researcher again sought to find out whether there were closing times for DRS. The opinions expressed by the three institutions varied. Some participants maintained that the service closed after library hours which was 5:00 pm. Other participants also stated that the service runs and extends to the evening hours of the library which is 10:00 pm

4.3.2.4 Uses of DRS

The researcher asked participants why users used DRS. Some participants revealed that most users used DRS because they were off campus. This was expressed as:

“DRS are mostly preferred by Distance Learning Students and off-campus students... they use DRS ...the service helps them to acquire information and answer their ready reference questions. They are more interested in DRS...”

Another participant answered that users use DRS for quick reference questions. Others also said some users do not want to be physically present in the library.

The researcher asked participants how frequent users used DRS. The participants answered that users were active on the platform and frequently used the platform. The number of

users increased on the platform during interim assessments, mid-semester exams, quizzes and end-of-semester examinations. One participant had this to say that:

“Final year students and postgraduate students doing their dissertation were usually the type of users who frequently use the service”.

According to participants, users used DRS for their reference queries especially for research consulting, advisory service and other reference services.

4.3.3 Views of Librarians concerning usage of DRS.

The researcher inquired from participants to find out librarians' views on DRS.

The researcher inquired from the interviewees if DRS must be replaced, integrated or separated from the traditional reference service. A number of participants said that DRS must work separately from the traditional reference service. One participant stated that:

“If the library really wants to get to their users, they don't just have to implement DRS and sit back..... It must be a whole department on its own Separated from the traditional reference in the library.”

Some participants were also of the view that DRS must be integrated. This did not mean librarians want to do away with TRS delivery. Some participants had the view that TRS must not be sacrificed for DRS, it must work hand in hand with the traditional reference.

This view was expressed by one participant as follows:

“The traditional reference service must not be taken off. It should run hand-in-hand with DRS...Although the use of internet has become rampant...but there are some people who are technophobia...”

Another participant stated that:

"I think that the whole library must be digitized...the library must go digital especially reference services... no more traditional method as it is in the advanced countries..."

The researcher further asked participants if users were able to clarify their questions through DRS. Interviewees shared that users were able to clear their questions on the platform. Others were of the view that sometimes it becomes difficult understanding users' questions. This view was shared by one participant whose view was express as follows:

"It is sometimes difficult reading users' queries on the platform...if it was to be face-face, you will easily relate the question with their facial expressions to understand their question. Even face-to-face some students find it difficult clarifying their questions, how much more digital..."

Moreover, the researcher inquired if librarians follow up on users queries with phone calls or email when users question is not clear on the DRS platform. It was revealed by one participant that:

"We don't follow up on users queries with email or telephone when questions are not clear... we tell them we don't understand their questions on the same platform...if still is not clear..."

Another participant shared that:

"We have a pool of questions to answer with many users on the platform waiting for feedback ...so if the questions are not clear, we go to the next question especially on emails".

The researcher inquired from participants how long it takes to respond to users' queries. Participants held the same opinion as to how long it takes to provide feedback to users. Interviewees responded that it based on the kind of question the user was asking.

One participant responded that:

“Some responses are quick and prompt while others needed time to respond”

They added that they refer users to other sources of information when necessary. Unfortunately, none of the institutions had a collaborative network with other libraries. The researcher further asked participants the use of DRS in the library service. Some participants stated that the existence of DRS have increased library services.

Researcher asked participants about the usefulness of DRS.

They responded that DRS were very useful in the library services. A participant stated that:

“Sincerely, DRS is one of the best... the library has. A lot of universities outside the country are using DRS. For instance, Facebook messenger, emails, Ask-a-Librarian and others which are helping the library especially in reference services.”

Another participant also said that:

“Library users should ask a librarian anytime they have queries..., people should not be in the library before they access information...”

One participant also maintained that:

“Surely, DRS will make a lot of significant difference in the reference service. Because the library is for users and if the library is not where its users are, then it is not making any impact.”

4.3.4 Training of librarians on DRS.

There was the need to find out from the participants how users are able to use DRS. Attempts were, therefore, made to find out if users were trained to use DRS platforms. Some participants answered that the platforms need no training. One participant answered that:

“The platforms were easy to use and since most users were technologically savvy, users were able to access with ease”

One librarian had this to say that:

“DRS is like chatting with friends...it is easy...a lot of users, especially students stayed on the internet so they know how to use DRS for their reference questions...”

The researcher inquired from participants if they undergo training on DRS. Some librarians acknowledged that they undergo training on the DRS especially in ASK-A-librarian while others responded that, some of the platform such as emails needed no special training.

The researcher probed further to ask the number of times they undergo training. It was revealed that the training is done at least once a year.

According to one head of IT:

‘We give In-service and hands-on training to staff pertaining to some DRS. This training is done as and when the need arise’.

4.3.5 Infrastructures and Technologies used for DRS.

The research found out from participants about the infrastructure that supports DRS in the three institutions.

4.3.5.1 Infrastructure and technologies

The researcher found from the head of IT about the infrastructure used in the implementation of DRS. Computer servers, operating system, Tablets, laptop computers, bandwidth, software and Internet-enabled devices.

The researcher again found from the heads of IT that, the common technology used for asynchronous DRS transaction was email as well as web base Technology. The tools used for synchronous DRS in the libraries were Ask-a-librarian, Facebook messenger, Twitter handle and others.

They further explained that the infrastructures were provided by the mother institution.

One of the participants asserted that:

‘We built an in-house software for Ask-a-librarian service’.

However, Facebook, Twitter handle, emails and others needed no software to work.

4.3.6 Challenges in the implementation and management of DRS.

The researcher interviewed participants on implementation, policies and guidelines and the challenges in the management of DRS by the libraries.

4.3.6.1 Implementation of DRS

The researcher inquired from the participants in the three institutions about the year DRS were implemented in the libraries. This question had varied responses from the heads of IT. A participant responded that DRS platform have been in existence in the library for about 4years. One participant also said that, had been in existence for about 5years while another participant maintained that it had been in existence for more than 5years.

4.3.6.2 Management of DRS

The researcher asked the participants how they manage DRS. It was discovered that IT staff provided technical support to DRS staff in case of challenges. The DRS is maintained through a regular update and upgrade. It was noted by one participant who made it clear that:

‘Clearly, the type of platform used and how it is updated depends on who managed it. The service is managed and updated by the IT staff in the library.’

4.3.6.2.1 Policies and Guidelines to manage DRS

Policies and guidelines must be put in place to support and direct the use of DRS. The researcher sought to inquire from the heads of the library whether there were policies and guidelines that regulated the use of DRS in the academic libraries. Unfortunately, none of the institutions had devised a formal policy. With regard to guidelines that govern the management of DRS, all the three institutions did not follow any guidelines. This implied

that DRS were not included in the library's policy, but rather the library used the reference services guidelines in managing DRS.

4.3.6.2.3 Funds

There must be available fund in order to upgrade, maintain and train staffs. A question was posed to find out from Heads of Library if they received funds in support of DRS. It was revealed that there were no available specific funds for DRS but rather it was included in the Library budget.

4.3.6.2.4 Evaluation of DRS

Participants were asked if users are given a user survey to evaluate DRS at the end of DRS transaction. Interviewees answered that there were no user surveys to assess DRS performance.

Also, they were asked if there were any other means they evaluate DRS. Unfortunately, there were no forms of evaluation. One participant said:

“I believe that, if we evaluate users at the end of every transaction, we will be able to identify their level of satisfaction to serve them better”.

Another participant also voiced out saying:

“It would have been better if there was a user feedback survey to assess DRS, this will help measure the quality and standard of service we provide on DRS”.

4.3.6.2. Challenges of DRS

This section was meant to find out some challenges in the use of DRS. It was noted that there were a few challenges associated with DRS. One major challenge revealed by a participant was lack of interest by some senior members to assist users on the DRS platform. Lack of interest by some academic librarians was a worry. Some participant librarians did not welcome the significance of DRS in reference and user services. Some interviewees also complained about the lack of Tablet to be used for DRS. This was to indicate that, Tablets must be provided to librarians to facilitate use. This would enable them to respond promptly to users anytime and even in times of power cut. Heads of IT indicated that sometimes internet network challenges made the service very difficult to be used. This made it difficult for staff to assist users. Participants noted that there were no lay down policies or guidelines that governed the use of DRS in the library.

4.3.7 Ways to improve DRS

Participants held different opinions as to how DRS can be improved. One participant suggested that adequate infrastructure must be provided to enable the use of DRS. The library must procure Tablets for staff to manage the service. Another participant had this to say:

"There must be an increase in marketing and publicity to create awareness among both users and librarians especially...".

A participant also suggested that senior members must be encouraged to use the service to increase the number of staff on the platform. Again, one participant said that the library must include other platforms of DRS. This is to say that, the library must expand the DRS channel to include other forms of social media platforms. Another participant suggested

that the service must include an interactive service to help users clarify their questions. One participant also recommended policies and guidelines to guide both users and librarians in their library transactions.

One IT staff held that:

‘The library needs to promote the services and be prepared... both users and librarians to embraced the service...’

4.4 Chapter Summary

The chapter covered the data analysis and findings of the study. The findings were presented under research questions. Interviewees were not identified with their statements in order to preserve their confidentiality. The questionnaire and interview revealed that respondents were aware of DRS and used it. It was revealed that DRS was very useful and significant. Users were not trained to use DRS, however, librarians receive training when necessary on the platform that needed training. On the other hand, there were no forms of evaluation to assess DRS. Also, the libraries lacked policy and guidelines in the use of DRS.

CHAPTER FIVE

DISCUSSION OF MAJOR FINDINGS

5.1 Introduction

This chapter covers the discussion of analysis and findings presented in Chapter Four in line with the following research questions:

- level of awareness and use of DRS by users
- Users and Librarians' view on DRS
- Training of DRS Librarians and users
- Infrastructure and technologies used for DRS
- Challenges in the implementation and management of DRS
- Ways to improve DRS

5.2. Level of Awareness and Use of DRS

The findings of the level of awareness and use are discussed below:

5.2.1 Reference Service

Reference service is an important service in the library. This is linked to user and librarian variable in the Digital Reference Model. This explained the discussion between librarian and users (Pomerantz et al. 2004). Finding from respondents indicated that more than half of the respondents used both Digital Reference Services (DRS) and Traditional Reference Services (TRS) for their reference queries in the library. Participant librarians affirm that both TRS and DRS are channels used for reference queries in the libraries. Bunge and Bopp (2001, p7) support the finding that academic libraries provide reference services either by

traditional reference, digital reference or both services. It is not surprising in the finding that users predominately use both TRS and DRS for their reference queries in three academic libraries because the previous study confirms that in practice, many libraries use both TRS and DRS.

Again, from the finding, more than half of respondents preferred traditional reference service to DRS. A Study by Grandfield and Robertson (2008) in two academic libraries in Toronto support that the traditional method of reference remains the most used reference service and as well as the first choice in getting assistant from the library. Kadir Wan Dollah and Singh (2010) also confirm in their study in four selected Malaysian academic libraries that, regardless of the introduction of DRS, about 56% of users prefer the traditional reference services for their reference queries. Despite the advantages and potential usefulness of DRS to respondents, they still indicated their preference for TRS. This may not be surprising, a number of challenges have characterised the use of DRS such as lack of prompt responses, internet challenge, among others. This may be the reason why respondents indicated their preference for TRS despite the advantages of DRS over TRS. There is the need to develop an existing DRS that ensure that users would appreciate and adopt more than the TRS.

5.2.2 Methods and Tools for DRS

The finding of the study indicated that Emails, Ask-a-Librarians, Facebook, Twitter and telephone calls were the DRS platforms used by the three institutions. Singh's (2012) study in four academic libraries in India supports that several libraries offer DRS on both synchronous and asynchronous transactions. Both synchronous and asynchronous were used in the three Libraries. The email was the common DRS platform among the three

libraries. This view is supported by one of the variable of Digital Reference Model, question acquisition which explains objective one which examines process of obtaining information from a user via e-mail or web forms (Pomerantz et al. 2004). This implies that, libraries employing synchronous and asynchronous transaction will better help answer users' queries. The asynchronous transaction would enable users to leave their queries behind even after library hours to be answered later whereas the synchronous which is real-time transaction would also give instant feedback to users' queries. For this reason, libraries would find it useful in assisting users on DRS.

In this technological era, emails play a significant role in our lives. Findings gathered from the study revealed that email was the preferred platform among the DRS platforms. Also, the finding revealed that KNUST recorded the highest response in the use of email platform. This view is supported by Roesch (2006) and Idan (2017). Email platform is less expensive and easy to access. Emails help to cut off the barriers which prohibit users from seeking physical assistance from the library. KNUST offers DRS in the form of email service and off-campus electronic resource which enable users to get answers from the library. It was expected in the findings that emails would be users' preference because emails have become a normal channel of communication in everyday life. Emails enhance selective dissemination of information (SDI) services as well as document delivery. For instance, requested articles can be sent to users and easily be downloaded via email. It is therefore natural for respondents to prefer the use of email services to supplement TRS.

5.2.3 Level of Awareness and use

In creating awareness, academic libraries need to market DRS to users. This also supported the question acquisition variable in Digital Reference Model linked to objective one. Data gathered from the findings indicate that respondents got to know about DRS from their institution's library website. Also, librarians affirm that DRS were marketed through institutional websites, during orientations, training programmes, flyers, and posters. Aman (2004) and Ahenkorah-Marfo (2015) confirm this finding that academic libraries have their own websites linked to at least two social media sites. Connaway and Radford (2011) however stress that it is not enough to put a link on your library website, rather, it is important to promote DRS among users with the use of library instruction and posters. This implies that, though it is important to have basic information on DRS on the libraries websites, it is equally important to create offline exposure through information literacy, workshops, and training programs in order for library users who do not visit the library's website to be aware of DRS in the library. This would attract prospective users to the service.

The finding of the study also indicated that more than half of the respondents were in agreement that the existence of DRS has increased the use of library services. Pomerantz and Luo (2006) confirm the finding by saying that exposure to DRS influences the help-seeking choices and preferences of the library client. It is remarkable from the finding that DRS is an additional service to the library, where users have a variety of services to choose from for their reference queries. The extensive use of DRS will increase the usage of library services.

Another finding from the study showed that more than half of the respondents used DRS because they were off campus. This view is affirmed by librarians that, users used DRS because they were off-campus. Pace (2003) confirms that DRS is an additional services to the library's existing reference service programme which permit patrons to write from work, home, or other locations. It is clear from the findings that, most users access DRS because they were off-campus which implies that DRS permit off-campus. Users need not travel from their homes and offices to access library facilities. The use of DRS bridges the gap between on-campus and off-campus library users.

Also, it emerged from the finding that, more than one-third of the respondents used DRS occasionally. From the interview responses, the librarian also confirms that users frequently used DRS during mid-semester exams, quizzes, interim assessment and end of semester exams. Final year and postgraduate students who want to complete their research were usually the type of users who frequently used the service. This view is in line with a study by Yonus (2014) in Pakistan. From his study, final year and postgraduate students were frequent users of DRS. The number of queries received from final year and postgraduate students in Pakistan was higher than that of other undergraduate students. This implies that more users use DRS during a particular period. Final year and postgraduate students are capable of using DRS for their research. It is important that all level of students use DRS for their queries.

The finding from respondents showed that the mobile phone was the medium of access in the use of DRS. Olajide and Oyenira (2014) confirmed that there are a number of devices that support DRS such as desktop, laptop, smart phones, among others. It is not surprising

that users use the mobile phone to access DRS. This is because the use of DRS requires users to stay online and mobile phone is one of the common devices for communication.

Another finding from this study showed that more than one-third of the respondents request for research consulting on DRS. Librarians affirm the view that most of the users of DRS use DRS for research consulting. This is supported by Smith (2010, p.4487) who explains that reference questions can be used for ready reference, reader's advisory, a research consulting, instruction, bibliographic verification and interlibrary loan, however, the library may perform these entire tasks or specialize in any of the services. Prior to these findings, most DRS users are final and postgraduate students who want to complete their research; hence, they use DRS for research consulting. It is necessary for libraries to promote the other forms of reference services to users to make access to information much flexible to users.

5.3 Users and Librarians' View on DRS

The views of users and DRS librarians were sought on experiences, feedbacks, and satisfaction in the use of DRS. This view is supported by the variable such as user and librarian in the Digital Reference Model linked to objective two (Pomerantz et al. 2004).

The findings from the respondents and interviews revealed that users preferred a separate DRS section away from the traditional reference services. However, a study by Chowdhury and Margarity (2004) in Scotland with three academic and two other libraries are not in agreement with the current study. They state that information access has changed from traditional to electronic and information accessed on the internet is cost effective and efficient than the traditional method, therefore, academic libraries must transform reference

service to digital reference service. Although TRS and DRS are under reference services, the current finding implies that users and librarian prefer a separate DRS section away from the TRS. Separating DRS from the TRS would decrease the workload of reference librarians to concentrate on their work schedule.

The findings indicated that more than half of the respondents were able to clarify their questions on DRS. On the contrary, the views of librarians opposed that sometimes it is difficult understanding users' questions. Smith (2001, p137) supports the view that librarians can misinterpret users' queries sent via email because they do not have the clues such as facial expression, gestures and tone of voice. The finding implies that users' sometimes asked incomplete questions which become a challenge for librarians to understand especially students who prefer short forms and abbreviations. This would be difficult for librarians to understand users' queries. By so doing Librarians should further ask users to clarify their queries.

Another view expressed by librarians is that they do not follow up on users question when users question are not clear on the DRS platform. This view does not support the digital reference model which explained that librarian must follow up on users with a telephone call or regular mail interaction when users' queries are not clear (RUSA, 2004). It appears that librarians are going their own ways in the use of DRS. There was no mechanism to follow up on users. This might be as a result of a lack of guidelines regarding how DRS is used in libraries. There is the need to improve DRS with clear service guidelines in the use of DRS.

It emerged from the findings that, more than half of the respondents did not receive prompt responses from the library on DRS. Finding from librarians explain that, some responses

are quick and prompt while others need time to respond. In line with the current finding Kasowitz (2001) mentions that users often do not receive prompt responses from libraries especially with email services. This implies that answers to users questions were based on the kind of queries received. Also, librarians may be offline at the time queries were sent and may not be able to respond promptly to users' queries.

On the issues of how long it takes to answer users' queries, the respondents revealed that it takes typically a day for questions to be answered on DRS. Nicholas (2011) confirms that simple answers to users queries sent over e-mail may take about twenty-four hours to be seen. This may imply that complicated questions could take even longer to be answered. Librarians should try as much as possible to give the quick responses to some questions such as ready reference questions.

Regarding users satisfaction on feedback, it emerged from the finding that an equal number of respondents were satisfied and somehow satisfied with feedback from librarians. According to Cummings, Cummings, and Frederiksen (2007), DRS in one way or the other satisfy the informational needs of users. The finding of this study could not establish a clear response from respondents in regards to feedback satisfaction however, it can be said that, users were satisfied with feedback. Librarians must understand that the speed of providing feedback to readers' queries have a great effect on user satisfaction.

From the finding, majority of the respondents had been referred to other sources of information to get answers to their questions. The findings are in line with Wasike (1999) and Pomerantz et al (2004). If there is no appropriate answer found for a user, the librarian may refer a user to other sources of information. Answer formulation, one of the components of the general digital reference model explains that librarians must take the

necessary actions to produce responses to users' queries, either by sending the response directly to user or reviewer.

On the issue of online approachability, the finding indicated that one-third of the respondents received "Hello how may we assist you" as the first message from the library. According to Radford (2006), to facilitate prompt response, there must be an online conversation in greeting the patron. This is how the interpersonal relationship is formed in an online environment. The library must acknowledge users on time by sending welcome messages to demonstrate approachability. These messages create a sense of a relationship between the user and the librarian.

Also, it emerged from the findings that there was no collaboration among DRS libraries Shaw and Spink (2009) support by saying DRS can be provided by an individual institution or as a collaborative network. Obviously, libraries could operate DRS without collaboration but it is essential for DRS libraries to collaborate in order to help overcome common problems and provide an opportunity to offer effective services to one another.

Again the findings from respondents and participant librarians agree that DRS platforms are very useful to users. A study in Kenya by Okongo (2014) confirms the finding by saying DRS is a useful channel for the dissemination of knowledge and also a powerful machinery that can help improve study performance. DRS have many advantages which promote libraries as well as help library users in the quest for information.

5.4 Training

From the study, none of the respondents received training on DRS. In addition, some interviewees also indicated that training on the use of some DRS platforms was done as and when the need arises. From the Digital Reference Model, the librarian variable explained the competencies of librarians which is linked to objectives three (Pomerantz et al. 2004). However, despite this obvious challenge, the interview confirms that the DRS platforms available in the Universities were easy to use coupled with the fact that most of the respondents were technologically savvy.

Overall, the findings indicated that training on DRS use is, at best haphazard, or at worse, inexistent. This finding has been confirmed by earlier researchers. Uutoni (2014) noted that even though librarians often undergo training on the use of some new library resources, this is often not extended to DRS. This situation must change if DRS is to be considered an integral aspect of modern library services in academic libraries in Ghana. Rodwell (2001) insists that DRS librarians need to be equipped and well-informed about the relevant resources further than their library collections. Campbell et al. (2002) support the opinion that training for librarians on DRS should be timely and on-going. Finally, Wassik (1999) states that libraries must develop a comprehensive training programme for their library staff on DRS. There is, therefore, a need for academic library managers to conscientiously integrate training for DRS into their overall training programmes for both staff and students. Furthermore, training in DRS may be implemented through a number of ways including continuous professional development programmes, orientation for staff, and visits to other well-established libraries where DRS have been implemented successfully.

5.5 Infrastructure and Technologies used for DRS

The development and implementation of DRS require infrastructure and technologies to link up library resources to library users. This corresponded to the tracking variable in the Digital Reference Model linked to objective four (Pomerantz et al. 2004). The findings of the study indicated that computer servers, operating systems, tablets, laptop computers, good bandwidth, in-software and all Internet-enabled devices are required infrastructure necessary for the establishment of DRS in academic libraries. Saffady (1995) enumerates a number of ICT requirements for the effective implementation of DRS in libraries and these include large information repositories, various online databases, information products, computer storage devices on which information repositories reside, computerized networked library systems, the Internet, CD-ROM information products, database servers, online catalogs, collections of computers and adequate technical support.

Findings from the IT staff of the three institutions showed that tools such as email were needed to handle asynchronous DRS whiles web forms technology such as Ask-a-Librarian, Facebook messenger, and the Twitter handle was used for synchronous DRS. The findings of the study supported the study of Lankes, Collins and Kasowitz (2000) which explained that a number of tools and technologies must be deployed in the implementation of DRS in libraries.

There is a need for strong policy imperatives in acquiring the relevant ICT infrastructure to catapult the successful implementation of DRS in academic libraries. Academic libraries must invest in stable power supply systems, strong internet connectivity, and the necessary technical skills to ensure the seamless communication with its clientele irrespective of their location.

5.6. Implementation and Management of DRS

The views of librarians and IT administrators were sought on implementation and management, policies and guidelines, funds and evaluation and challenges in the use of DRS.

5.6.1 Implementation and Management of DRS

On the question of how long DRS had been operational in the participant libraries, it emerged from the findings that DRS was not a new phenomenon as it has been in existence for at least five years in all the libraries. From the Digital Reference Model, the answer formulation variable explained the actions taken by the librarian to generate answers. This is linked to objective five (Pomerantz et al. 2004). This finding is in line with the experiences of other libraries in the developing world. For instance in Pakistan, Yonus (2014) found that five out of nine public academic libraries had implemented DRS for more than five years. The fact that DRS was not so new in these academic libraries calls for the improvement of their quality of services to enhance their work.

In respect to the management of DRS, the data gathered from respondents indicated that more than half of the users were indecisive about how libraries managed DRS. The findings of the study are in agreement with Wasik (1999) who stated that many academic libraries struggled to manage and maintain a consistent quality of DRS for their users.

Finally, on the issue of maintenance of the DRS technologies, the findings revealed that DRS technologies are maintained through regular updates and upgrades by ICT staff. This is a good revelation as the contrary would have resulted in technological obsolescence, thus

rendering the services ineffective. As Uutoni (2014) suggests, the ICT infrastructure and technologies used for DRS should be maintained by regular updates and upgrades of software for better performance.

5.6.2 Policies and Guidelines to manage DRS

Regarding the availability of policies for DRS, the findings indicated that none of the institutions had policies as well as guidelines that govern the implementation and management of DRS in the libraries. This view is confirmed by Malik and Mahmood (2013). They revealed that in Punjab province, most academic libraries had not devised any formal DRS policy and guidelines to manage their libraries. The IFLA Digital Reference Guidelines (2008) emphasise on the need for development of digital reference policies in libraries. It describes the code of conduct, service goals, review policy and guidelines. The lack of policy and guidelines may be considered as one of the weaknesses of DRS on the part of the three libraries.

5.6.3 Funds

On the matter of funding for DRS activities, it emerged from the findings that there was no specific allocation of funds budgeted for DRS but rather, the three academic libraries were running DRS with existing library resources. RUSA (2010) urges that libraries ought to estimate the initial costs and recurring costs for developing and managing DRS. Libraries must apportion specific amount of funds in their periodic budgets essentially for DRS. Ahenkorah-Marfo, (2015) also explained that no library can implement and manage DRS without funding. In order to run DRS on a long-term basis, academic libraries must allocate specific fund for DRS in their library budget. Initial and on-going fundings are required for implementation and management of DRS.

5.6.4 Evaluation

In respect to whether or not the libraries evaluate DRS services, it was revealed that none of the institutions evaluate users after DRS transactions. This finding is at variance with the evaluation component of the digital reference model. Evaluation should be employed to identify the strength and weakness of DRS to improve the service through training, adjustment of staffing, levels of staffing, service parameters, and other improvement indicated by the evaluation results.

The findings again opposed that of Weller (2007) who opined that evaluation helps to understand whether the activity set out was achieved, how well you performed, the processes and effect of the activities to benefit the library and the clients. Libraries implementing DRS can employ user surveys to help identify the strength and weakness of DRS for better performance. This would ensure users' satisfaction.

5.6.5 Challenges of DRS

The implementation of any ICT-based service is likely to be fraught with challenges. The findings of the study revealed that DRS were inactive after library hours in the three academic institutions. This finding was confirmed by Smith (2001) who found that 'chat' and other real-time services, were available when a reference librarian is at work. Remote researchers would therefore not be able to send reference requests twenty-four hours a day. This makes it difficult for off-campus users to access DRS in the libraries.

It also emerged from the findings that some librarians lacked interest in DRS. The findings supported the study of Chauhan's (2013) that most academic librarians, particularly in the developing countries, were not aware of the various DRS tools available to libraries; and among those who were aware, they found them to be incompatible with reference services.

This may be that some librarians in the three institutions were reluctant to change with current trends and did not appreciate DRS in reference and user service. There is a need to conscientise reference librarians of the need to embrace technology in the delivery of their work as it technology can enhance their reference services.

Finally, data gathered indicated that poor Internet connectivity made it difficult for staff to assist users. According to Radford (2006), internet disconnection is a barrier to the quality of DRS as it interrupts the sharing and transferring of files and also hinders DRS to function successfully. Therefore, it is important for library managers to acquire strong Internet bandwidth to ease the use of DRS for both users and librarians.

5.7. Ways to improve DRS

In regards to the respondents' views on how to improve DRS, a number of suggestions and recommendations emerged from the findings. First, the respondents suggested that the three libraries operate DRS on a 24hour basis. Strong (2006) confirmed that Digital Reference Services must be available on a 24hour basis anywhere in the world, offering flexible arrangements for users.

Second, users called for enhanced user education and awareness, whilst participant librarians also called for improved participation of all other librarians. These calls echo that of Okongo (2014) who explained that in order to make use of DRS, librarians' and users' awareness must be improved for them to acquire practical skills necessary to exploit the DRS.

Again, the finding recommended that some of the libraries must include interactive service to help conduct real-time interviews in order to help users clarify their questions. Uutoni (2014) supported the finding that one of the challenges of providing asynchronous services (emails) was the inability to conduct real-time interviews. For this reason, libraries must encourage synchronous services like chat services such as Ask-A-Librarian and Facebook messenger.

It also emerged from the finding that libraries must have written policies to guide the use of DRS. This suggestion was supported by the IFLA Digital Reference Guidelines (2008). The IFLA policy is a worldwide policy for libraries; therefore, it is important for libraries to implement policies and guidelines on DRS with the help of IFLA Digital Reference Guidelines.

5.8 Chapter summary

The discussion of the findings was done with reference to the reviewed literature. It emerged from the discussion of the findings that users are aware and had knowledge in the use of DRS but some librarians lack personal interest and skill to manage the DRS platforms. Although, training is very important, however, not all the platforms needed training.

Users and Librarians had some challenges in using DRS for reference queries. Some of the challenges were lack of prompt response, inactive of DRS after library hour, lack of continuous training, lack of staff, lack of policies and guidelines in the use of DRS as well as evaluation to assess the strength and weakness of DRS. Real-time interviews were

difficult for asynchronous service. Librarians had challenges with internet connectivity, which is capable of interrupting DRS transactions.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

6.1 Introduction

This chapter gives a summary of findings based on the research questions of the study. It also provides conclusions and recommendations based on the findings to address the challenges in the use of Digital Reference Services (DRS) in academic libraries in Ghana.

6.2 Summary of findings

The study examined Digital Reference Services (DRS) in academic libraries in Ghana. The major findings are outlined as follows:

6.2.1 Level of Awareness and Use of DRS in Academic Libraries

The findings of the study revealed that the three academic libraries used both traditional and digital reference services to answer users' queries. However, users prefer the traditional reference to digital reference services. Regarding the popularity of the various DRS platforms, users preferred email to the others in the three academic libraries. Moreover, the DRS platforms were promoted especially via the library websites of the institutions. Furthermore, it emerged from the findings that the existence of DRS have increased the use of library services. Findings from the study indicated that the respondents used DRS when they were off campus. Also, users occasionally use DRS platforms during quizzes, mid-semester examinations, interim assessment and end-of- semester examinations. Most of the DRS users are final and postgraduate students who want to complete their research. The mobile phone was found to be the most common medium of

access among the DRS users. It emerged from the study that respondents request for research consulting on DRS.

6.2.2 Users and librarians' views

The views of users and those of participant librarians were sought on experiences, feedbacks and satisfaction in the use of DRS.

It emerged from the findings that respondents preferred a separate DRS section away from the traditional reference services. On the issue of users' ability to clarify their question on DRS, the majority of respondents indicated that they were able to clarify their questions. On the contrary, the views of librarians opposed that sometimes it is difficult understanding users' questions. It came out that whenever users' queries were not clear, there were no mechanisms to follow up on users to clarify their question.

Again the study found that users lacked prompt responses from librarians on DRS. On the other hand, librarians expressed that, the responses were based on the kind of question users asked. From the finding, users were satisfied with regard to feedbacks. The majority of the respondents had been referred to other source to get answers to their questions. Unfortunately, none of the institutions had a collaborative network with other libraries. On the issue of online approachability, "Hello how may we assist you" was a common welcome message on the DRS platform in the three institution. Also, findings from respondents and participant librarians agreed that DRS useful for users.

6.2.3 Training

On the issue of training, finding revealed that none of the respondents received training on DRS. some participant librarian also indicated that training on the use of some DRS platforms was done as and when necessary.

6.2.4 Infrastructure and Technologies

With regards to infrastructure, the study indicated that computer servers, operating systems, tablets, laptop computers, good bandwidth, in-software and all Internet-enabled devices were required for the implementation of DRS in academic libraries.

It was found from IT staff of the three institutions that tools such as email were needed to handle asynchronous DRS whiles web forms technology such as Ask-a-Librarian, Facebook messenger, and Twitter handle were used for synchronous DRS.

6.2.5 Management and Implementation of DRS

Data gathered from the findings indicated that DRS have been in existence for at least five years in all the libraries. Also, it emerged from respondents that more than half of the users were indecisive about how libraries managed DRS. Again, it was found from the study that DRS technologies were maintained through regular updates and upgrades by ICT staff.

In respect to the availability of policies for DRS, the findings revealed that none of the institutions have policies as well as guidelines that direct the implementation and management of DRS in the libraries.

In regards to funding for DRS activities, it came out that academic libraries were running DRS with existing library resources because there was no specific allocation of funds budgeted for DRS.

The finding of the study indicated that none of the institutions evaluate users after DRS transactions.

The implementation of DRS was fraught with some challenges. The finding showed that DRS were inactive after library hours in the three academic institutions. Furthermore, the findings indicated that some librarians lacked interest in DRS. Moreover; the study indicated that poor Internet connectivity made it difficult for staff to assist users.

6.2.6 Ways to improve DRS

In regards to the respondents' and librarians views on how to improve DRS, a number of suggestions and recommendations emerged from the data analysis. First, users and librarians called for users enhanced education and awareness as well as the improved participation of librarians on DRS.

Secondly, the respondents suggested that the three libraries operate DRS on a 24/7 basis. Again, the finding recommended that some of the libraries must include interactive service to help conduct real-time interviews.

Furthermore, it is recommended from the finding that libraries must have laid down policies to guide the use of DRS.

6.3 Conclusion

Digital reference services have made libraries more visible among the invisible and remote library clients. Obviously, the traditional reference services continue to be the most popular means of getting help, however, the establishment of DRS such as email, Facebook, Ask-a-librarian, Twitter handle, and telephone and other DRS platforms in libraries have made answering users queries more cheaper and efficient. This has made library transactions attractive. The level of awareness and use of the various DRS platforms in libraries is critical for both librarians and users because it contributes to an increase use of the library

services. It has become necessary for librarians to be on board, however, the lack of personal interest by librarians in the use of DRS resisted them. Nevertheless, DRS is not a replacement of the traditional reference service but rather another platform that works hand in hand with the traditional reference services.

Unfortunately, the use of digital reference services come with some challenges such as difficulties in understanding users' queries, the lack of prompt responses, inactivity after library hours, internet challenge and among others. But the impact of these challenge is minimal, it is therefore equally important for library management to lay down policies and guidelines in the use of DRS to improve the quality of services provided by academic libraries. Also digital reference services must be regularly evaluated to ensure the success of DRS in academic libraries.

6.4 Recommendations

The following recommendations are made within the context of the selected academic libraries:

6.4.1 Recommendations on improving the awareness and use of DRS

Users must be sensitized on the advantages of the use of DRS to encourage them to embrace and develop the interest in the use of DRS for their information needs. DRS will provide quick answers to their queries as well as lessen the time they spend in coming to the library.

Users must be trained through library orientations and information literacy courses to be informed about the procedures in the use of DRS. This would equip and teach them how to formulate, express and clarify their queries on DRS.

6.4.2 Recommendations on training and capacity in DRS in academic libraries

1. Libraries must stress on the availability of DRS during orientation, workshops, and training programmes to enhance awareness for prospective users. This will increase service patronage of DRS.
2. Also, there is a need for staffing strategy; librarians must embrace and learn to use DRS to assist library users. Many librarians may be reluctant to assist users on DRS because of workload or busy work schedule in the library. Hence, DRS should be operated by separate librarians mainly to provide service on DRS. When the number of librarians' increases, there will be prompt responses for users' queries.
3. Training is very essential in every institution; therefore, training must be on-going. Because DRS involves innovative uses of technology that calls for specific skills, libraries should develop and integrate training programmes for their staff working with DRS at the time of implementation and throughout the period of offering the services. Apart from the in-service training, libraries must organize workshops, conferences, visits to other established libraries, embark on continuous development programme and job rotation to equip librarians. Also, hand-outs with screenshots must be given out to librarians for directions on how to work with DRS.
5. There must be a consortium of Digital Reference Services librarians to collaborate on DRS to support users' queries outside the library premises. The consortium may come out with policies and guidelines in the use of DRS to help both users and librarians. Member libraries may share their time, staff and resources to provide collaborative consortium.

6.4.3 Recommendations on infrastructure and technologies in DRS in academic libraries

1. DRS is operated online which required internet connectivity therefore, libraries must improve on their internet connectivity. This can be done by increasing bandwidth and other internet-enabled devices. Regular maintenance of the infrastructures must be done to improve the technical standard of internet connectivity.
2. The library must procure tablets for librarians to be used for DRS. this will help mitigate the problem of prompt responses and inactivity of DRS after library hours.

6.4.4 Recommendations for the management of DRS in academic libraries

In order for effective and proper management and implementation of DRS, academic libraries need to follow the IFLA Digital Reference Guidelines (IFLA, 2008) and RUSA Guidelines for Implementing and Maintaining Virtual Reference Services (RUSA, 2010) These policies and guidelines provide recommendations and direction for all types of libraries.

Assessment and evaluation must be done often to adjust and improve the standard of DRS. Evaluations will bring out the strength and weakness to make the necessary changes in the service. The formative and summative evaluation must be done to assess the service. User feedback or survey can be administered to improve the quality of the service and user satisfaction

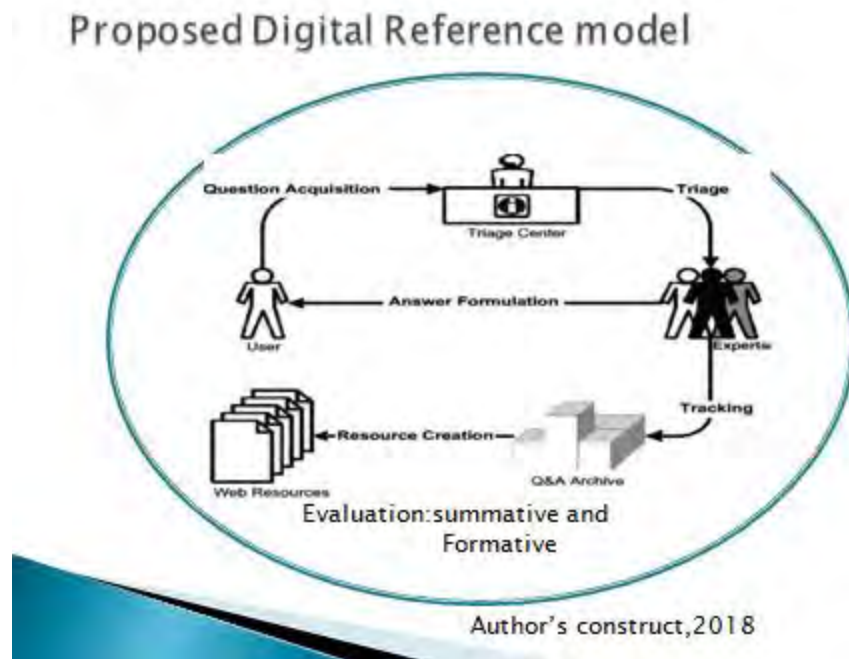
Specific funds must be allocated to library budget to support DRS to help in management and maintenance as well as training of librarians on DRS. Academic libraries need to allocate a separate fund in their budgets for expenditures of the service, such as

maintenance and upgrading of ICT infrastructure, staff training, marketing, software, reference materials and other library resources that will help DRS.

6.5 Contribution to Knowledge

The study adopted the general digital reference model by Pomerantz, Nicholson, Belanger, and Lankes (2004) as the theoretical framework for the study. Although evaluation is not a component of the model, the researcher proposed that the evaluation would be part of the components of the general digital reference model. This is because, at the end of the DRS transaction, it is necessary for libraries to evaluate the service to identify the strength and weakness of the service to adjust and improve on the service.

Figure 6.1 Proposed Digital Reference Model



An evaluation must be employed by libraries to assess the strength and weakness of DRS reference services. Formative evaluation can be carried out during the development of DRS to test ideas, concepts, timing, and prototypes of the representative of the library users while summative evaluation can be done to evaluate the outcome of the transaction whether DRS meet its objectives and also the impact on library users.

Several scholars have conducted studies on DRS in academic libraries, however, most of the studies focused on the librarian. Limited literature has been found to establish the level of application of DRS in Ghanaian academic libraries. For instance, Idan (2017) studied digital reference services in academic libraries in Ghana but limited the scope to only one academic library, Kwame Nkrumah University of Science and Technology. Also, Ahenkorah-Marfo (2015) sought to investigate the knowledge and use of social media by reference and user services librarians in Ghana. However, the study fails to access the knowledge level from library user perspectives. However, this study included the perspectives of library users. In terms of scope, this study was expanded to cover three academic libraries.

The study identified some challenges and made some recommendations. Hopefully, if the recommendations of the study are given the necessary attention, it would help academic libraries address the challenges of libraries in regards to DRS. This would improve the services of academic libraries in regards to DRS.

6.6 Suggestions for Future Research

Much more research needs to be conducted in Ghana especially in the private academic libraries to assess the use of digital reference service in private universities.

Further research can be conducted on Ask-a-Librarian services since it is peculiar to only one academic library in Ghana.

Further studies need to be conducted on the evaluation of DRS in terms of usage and organizational process.

Also, studies need to be conducted on the implementation and management of DRS in libraries.

BIBLIOGRAPHY

- Ahenkorah-Marfo, M.(2015). Knowledge and use of social media by reference and user service Librarians in public and private universities in Ghana. Masters Thesis. Legon, University of Ghana. Available at: <http://ugspace.ug.edu.gh>. (Accessed on 12/2/2018)
- Ahenkorah-Marfo, M., & Akussah, H. (2016). Changing the face of reference and user services: Adoption of social media in top Ghanaian academic libraries. *Reference Services Review*, 44(3), 219-236.
- Agyen-Gyasi, K. (2008). User education at the Kwame Nkrumah University of Science and Technology (KNUST) Library: prospects and challenges. *Library Philosophy and Practice (e-journal)*, 193.
- Akor, P.U. & Alhassan, J.A(2015). Evaluation of Reference Services in Academic Libraries: a Comparative Analysis of Three Universities in Nigeria. *Journal of Balkan Libraries Union* , 3, (1), 24-29
- Aman, M. (2004). ‘Use of Malaysian academic library websites by university Students’ *Information Development*, 20,(1), 67-71
- Amekuedee, J. O. (2005). An evaluation of library automation in some Ghanaian university libraries. *The Electronic Library*, 23(4), 442-452.
- Ask A Librarian, (2013). Ask-a-librarian Services. Available at: <http://www.ask-a-librarian.org.uk/>.(Accessed on 26/06/ 2018).
- Ask Jeeves, (2014). Ask Jeeves Services. Available at: <http://uk.ask.com> (Accessed on 26/06/2018)
- Association of Common Wealth Universities (2015). Common Wealth Universities. Available at: <https://www.acu.ac.uk/scholarships/commonwealth-scholarships/knust>. (Accessed on 29/11/2017)
- Ayiah, E. M., & Kumah, C. H. (2011). Social networking: A tool to use for effective service delivery to clients by African libraries. *Proceedings of IFLA Conference*, 13 – 18 August, San Juan, Puerto Rico. Available at: <http://conference.ifla.org/ifla77> (Accessed: 10/4/2018)
- Babbie, E. (2008). *The Basics of Social Research*. 4th ed., Belmont: Thomson Wadsworth, p289.

- Badilah , S., Shahar, B. J., & Chew, W. F. (1996). Malaysia libraries for national development. *A country report paper presented at the tenth congress of Southeast Asian libraries(CONSAL)*. Kuala Lumpur.
- Bailey, T., Cloete, N., & Pillay, P. (2011). Case study: Ghana and University of Ghana. *Cape Town: Centre for Higher Education Transformation*.
- Balme Library. (2000). *An Introduction for Readers*. Balme Library, University of Ghana.
- Bennett, L.(2016) Advantages and disadvantages of google form. Available at <https://prezi.com>(Accessed on 20/4/2018)
- Bradley, A., & MacDonald, M. (2011). *The social organization*. Boston, Massachusetts: Harvard Business Review Press.
- Bryman, A.(2004). Social research methods. 2nd ed. New York: Oxford
- Bunge, C. A. (1999). Reference services. *The Reference Librarian*(31), 185-199.
- Bunge, C.A. & Bopp, R.E., 2001. History and varieties of reference services. In: Bopp, R.E. and Smith, L.C., eds., *Reference and information services: a introduction*. 3rd ed. Colorado: Libraries Unlimited, pp. 3-27.
- Burke, L. (2003). 'The future role of librarians in the virtual library environment'. *The Australian Library Journal*, 51(1): 1-1
- Cahill, K. (2009). Building a virtual branch at Vancouver Public Library using Web 2.0 tools. *Program: Electronic Library & Information Systems*, 43(2), 140-155.
- Campbell, K. A., Jones, M. f., & Shuttle, J. (2002). Chat Reference. *The Reference Librarian*, 38 (79-80), 297-309. doi.org/10.1300/J120v38n79_20
- Cassell, K. A. (1999) *Developing Reference Collections and Services in an Electronic Age: How-To-Do-IT Manually for Librarians*, No. 95. New York: Neal Schuman Publishers.

- Chauhan, M. (2013). Use of Social media in libraries. Available at: www.alibnet.org/bookofpaper/ppts (Accessed: 27/06/2018)
- Chow, A., & Croxton, R. (2014). A usability evaluation of academic virtual reference services. *College & Research Libraries*, 75,(3), 309–361
- Chowdhury, G., & Margariti, S. (2004). Digital reference services: a snapshot of the current practices in Scottish libraries. *Library Review*, 53(1), 50-60.
- Chowdury, G. G. (2002). Digital libraries and reference services: Present and future. *Journal of Documentation*, 58, 258-283.
- Connaway, L. S., & Radford, M. L. (2011). Seeking synchronicity: Revelations and recommendations for virtual reference. Dublin, OH: OCLC Research. Available at: <http://www.oclc.org/content/dam/oclc/reports/synchronicity/full.pdf> (Accessed on 4/2/2018)
- Connaway, L. S., & Radford, M. L. (2011). Seeking synchronicity: Revelations and recommendations for virtual reference. Dublin, OH: OCLC Research. Available at: <http://www.oclc.org/content/dam/oclc/reports/synchronicity/full.pdf> (Accessed on 4/2/2018)
- Covey, D. T. (2003). The need to improve remote access to online library resources: filling the gap between commercial vendor and academic user practice. *Portal: Libraries and the Academy*, 3(4), 577-599.
- Creswell, J. W. (1999). Mixed-method research: Introduction and application. *Handbook of educational policy*, 455, 472.
- Creswell, J. W. (2012). Educational research. *Planning, conducting, and evaluating quantitative and qualitative research*.
- Creswell, J.W & Plano Clark, V.L. (2008) Designing and conducting mixed method Research. Thousand Oaks: sage publications. Pp 45-48.
- Crouch, M., & McKenzie, H. (2006). The logic of small samples in interview-based qualitative research. *Social Science Information*, 45 (4), 18.

- Cummings, J, Curmmings, L. & Frederiksen, L. (2007) "User Preferences in Reference Services: Virtual Reference and Academic Libraries". *Portal: Libraries & Academy*, 7, (1), 81-96.
- Curry, E. L. (2005). The reference interview revisited: Librarian-patron interaction in the virtual environment. *SIMILE: Studies in Media Information Literacy Education*, 5(1).
- DeeAnn, A. (2011). Chatbots in the library: is it time. *Library Hi Tech*, 30(1), 95-107.
- Dee, C. & Allen M. (2006) "A survey of the usability of Digital Reference Service on Academic Health Science Library Web Sites". *The Journal of Academic Librarianship*, 32, (1), 69-78.
- Dee, C., & Stanley, E. E. (2005). Information-seeking behavior of nursing students and clinical nurses: implications for health sciences librarians. *Journal of the Medical Library Association*, 93(2), 213.
- Denscombe, M. (2009). *Ground rules for social research: Guidelines for good practice*, (2nd ed.). Berkshire: Open University Press
- Dinkelman, A., & Stacy-Bates, K. (2007). Accessing e-books through academic library web sites. *College & Research Libraries*, 68(1), 45-58.
- Dollah, W., Kadir, W. A., & Abdul Kadir, R. (2010). Academic digital library in Malaysia: A case study on the status of digital reference services
- Dollah, W., Kadir, W. A., & Singh, D. (2007). Digital Reference Services in Malaysian Academic Libraries.
- Dollah, W., & Kadir, W. A. (2006). Digital reference services in selected public academic libraries in Malaysia: A case study.
- Dollah, A. K. W., & Singh, D. (2012). *Digital reference services in academic libraries*. University of Malaya Press.

- Edwards, R; Holland, J (2013). *What is qualitative interviewing?*. Bloomsbury Academic. pp. 2–3. ISBN 9781849668095
- Eke, H.N. & Ekwelem, V.O. (2014). Exploratory study of online Reference services of libraries in Nigeria .*Library Philosophy and Practice (E-Journal)*. Paper 1193. Available at :<http://Digitalcommons.Unl.Edu/Libphilprac/1193>. (Accessed On 29/1/2018).
- Emojorho, D. (2012). An appraisal of digital reference services in Nigerian university libraries. *African Journal Online*. Vol.9, No. 2. Available at <https://www.ajol.info/index.php/ict/article/view/87074>. (Accessed on29/1/2018)
- Explorable.com(2009).Convenience Sampling. Available at: <https://explorable.com/convenience-sampling> (Accessed on 20/11/2017)
- Fagan, J., & Calloway, M. (2001). Creating an instant messaging reference system. *Information Technology and Libraries*, 20(4), 202-212.
- Ferguson,C. D. (2000).Shaking the conceptual Foundations ”Too: integrating Research and Technology support for the next Generation of information service” *College and Research libraries* 61:300-311.
- Ferguson, C. D., & Bunge, C. A. (1997). The shape of services to come: Values-based reference service for the largely digital library. *College & Research Libraries*, 58(3), 252-265.
- Francoeur, S. (2001). An analytical survey of chat reference services. *Reference Services Review* 29(3), 1889-203.
- Fraenkel, J. R., & Wallen, N. E. (2008). Introduction to qualitative research. *How to Design and Evaluate Research in Education, 7th ed.* Boston, MA: McGraw-Hill International Edition.
- Gay, L. R. (1996). Educational Research: Competencies for Analysis and Application. Beverly Hill, CA: Sage Publications.

- Gorman, G.E. & Clayton, P. (2005). *Qualitative research for the information Professional: a practical handbook*. 2nd ed. London: Facet Publishing.
- Granfield, D. & Robertson, M. (2008). Preference for reference: new options and choices for academic library users. *Librarian and Staff Publications*. Paper 13. Available at: http://digitalcommons.ryerson.ca/library_pubs/13. (Accessed on 6/1/ 2018)
- Green, S.S. (1876). Personal relations between librarians and readers. Available at at: <http://polaris.gseis.ucla.edu/jrichardson/DIS220/personal.htm>. (Accessed on 21/01/18)
- Greenstein, D. (2010). Strategies for Sustaining the University. *Libraries Portal: Libraries and the Academy*, 10,(2), 121-125.
- Gross, M., McClure, C. R. & Lankes, R. D. (2001). Assessing quality in digital Hi Tech News, 29(1), 8-20.
- Han, L., & Goulding, A. (2003). Information and reference services in the digital library. *Information services & use*, 23(4), 251-262.
- Idan, A.M. (2017). *Digital Reference Services in Academic Libraries*. Unpublished Dissertation, Legon, University of Ghana.
- Ifidon, S & Ifidon, E. (2008). *Reference and Information Services in African Libraries*. Ibadan : Spectrum Books Ltd : 175.
- IFLA. (2008). *IFLA digital reference guidelines*. Available at: <http://www.ifla.org/publications/view/ifla-digital-reference-guidelines>. (Accessed on 5/5/2018)
- Igun, S. E. (2005) Users and Internet Skills: A Report from Delta State University, Abraka Nigeria. *Electronic Journal of Academic Special Librarianship* Vol. 6 NO. 3. *Information Institute*. Information Sciences. 3rd ed. [online]. New York: Taylor and Francis. pp. 4485
- Janes, J.(2003). What is reference for? *Reference Services Review*, 31(1), 22-25
- Johnson, J. S. (1991) Computerizing Information Systems in Developing Countries: Keys to Sustainable Development. *Pakistan Library Bulletin*, .22, (3) 22-30.

- Kadir Wan Dollah, W. A., & Singh, D. (2010). Determining the effectiveness of digital reference services in Malaysian academic libraries. *The Reference Librarian*, 51(4), 329-354.
- Kaplan, L.(1947). The early history of reference service in the United States. *Library Review*, 11 (3), 286-290
- Kasowitz, A. S. (2001). *Trends and issues in digital reference services*. ERIC Digest. Available at <http://www.eric.ed.gov>. (Accessed on 28/6/2018)
- Katz, W.A.(2002). Introduction to reference work volume I: basic information services. 8th ed. New York: McGraw-Hill
- Kawakami, A., & Swartz, P. (2003). Digital reference training and assessment for service improvement. *Reference Services Review*, 31 (3), 227-236.
- Kern, M.K. (2009). *Virtual Reference Best Practices: Tailoring Services to Your Library*. Chicago: ALA. ISBN 978-0-8389-0975-1 knowledge renaissance: selected papers from the World Library.
- Koelen, M., & Quaye-Ballard, J. A. (2009) The Importance of Digital Libraries in Joint Educational Programme: A Case Study of a Master of Science Programme Involving Organizations. *D-Lib Magazine* 15, 11- 12.
- Kresh, D.(2003). Virtually yours. *The Reference Librarian*. Vol 38 (79), pp. 19-34.
- Kuhn, G. (2016). Market Research Tips 10 Benefits to Protecting Your Online Survey. Available at: <https://www.driveresearch.com/single-post/2016/09/12/10-Benefits-to-Pretesting-Your-Online-Survey>. (Accessed on 13/9/2018)
- Kwame Nkrumah University of Science and Technology (2016). Student enrollment. Available at <https://www.knust.edu.gh/enrollment>. (Accessed on 26/11/2017)
- Kwame Nkrumah University of Science and Technology (2016). “Our history”. Available at KNUST Official website. (Accessed on 19/9/2018)

Lamprey, R. B. (2010). Promoting effective use of library resources and services at Kwame Nkrumah university of science and technology library, Kumasi, Ghana.

Lankes, R. D. (2000). 'The birth cries of digital reference: an introduction to this special issue'. *Reference and User Services Quarterly*, 39,(4), 352-354.

Lankes, R. D., Collins III, J. W., & Kasowitz, A. S. (2000). *Digital Reference Service in the New Millennium: Planning, Management, and Evaluation. The New Library Series, Number 6*. Neal-Schuman Publishers, Inc., 100 Varick St., New York, NY 10013. *Library Review*, 11 (3), 286-290

Lee, K. H., & Teh, K. H. (2000). Evaluation of academic library web sites in Malaysia. *Malaysian Journal of Library & Information Science*, 5(2), 95-108.

Lipow, A. G. (1999). 'Serving the remote user: reference service in the digital Environment'. Available at <http://www.csu.edu.au/special/online99/proceedings99/200.html>. (Accessed on 3/1 /2018)

Luo, L. (2008). Chat reference evaluation: a framework of perspectives and measures. *Reference Services Review* 36 , (1), 71-85.

Luo, L., & Buer, V. B. (2015). Reference service evaluation at an African academic library: the user perspective. *Library Review*, 64(8/9), 552-566.

Mack, D., Behler, A., Roberts, B., & Rimland, E. (2007). Reaching students with Facebook data and best practices. *Electronic Journal of Academic and Special Librarianship*, 8(2) Available at: http://southernlibrarianship.icaap.org/content/v08n02/mack_d01.html(Accessed on 3/1 /2018).

Malik, A. & Mahmood, K. (2014) Readiness for digital reference service (DRS) in university libraries: a survey in the Punjab, Pakistan. *Journal of Information Development*. 30, (2), 181-188.

Malik, A., & Mahmood, K. (2013). Readiness for digital reference service (DRS) in university libraries: A survey in Punjab, Pakistan. *Library Review*, 62 (6/7), 420-428.

- Mavodza, J. (2010). Knowledge management practices and role of an academic library in a changing information environment. The case of the Metropolitan College of New York: (PhD thesis), University of South Africa.
- McClure, C. R., Lankes, R. D., Gross, M., & Choltco-Devlin, B. (2002). Statistics, Measures, and Quality Standards for Assessing Digital Reference Library Services: Guidelines and Procedures
- McGillis, L., & Toms, E. G. (2001). Usability of the academic library web site: implications for design. *College & research libraries*, 62(4), PP355-367.
- McGlamery, S., & Coffman, S. (2000). Moving reference to the Web. *Reference & User Services Quarterly*, 380-386.
- Mu, X., Dimitroff, A., Jordan, J. & Burclaff, N.(2011). A survey and empirical study of virtual reference service in academic libraries. *The Journal of Academic Librarianship*, 37 (2), 120-129.
- Nicholas, P. (2011). Creating a digital reference agenda for academic libraries in Jamaica: An exploratory case study. *Libri*,. 61,pp 258-280.
- Nilsen, K. (2004). The library visit study: user experiences at the virtual reference desk. *InformationResearch*9(2). Available at:<http://informationr.net/ir/9-2/paper171.html>(Accessed on 6/1/ 2018)
- Nordin, S.K, Kassim, N.A., & Baharuddin, K.(2012). Evaluating Digital Reference service in University Libraries. Available at :<http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=6422870>. (Accessed on 8/11/2017).
- Oakleaf, M. (2010). *The value of academic libraries: A comprehensive research review and report*. Assoc of Cllge & Rsrch Libr.

- O'Reilly, T. (2005). What is Web 2.0: Design patterns and business models for the next generation of software? Available at: www.oreillynet.com/pug/a/oreilly/tim/news/2005/09/30/what-is-web-2.0.html?page=1 (Accessed on 22/10/2017)
- Oketunji, I. (2005). Reference Services: Its Functions and Importance in Libraries and Information Centres. Paper Presented at the 2005 National Interactive Library Seminar 27 on Application and Utilization of ICT to Reference Services in Libraries and Information Held in Jos, 26-28 April:
- Okongo, A.N.(2014)Access and utilization of digital information services in academic libraries: the case of university of Nairobi. Published Thesis. (Accessed on 24/10 2017)
- Oppenheim, A. N. (2000). *Questionnaire design, interviewing and attitude measurement*. Bloomsbury Publishing.
- Pace, A. (2003). "Virtual Reference: What's in a Name?". *Computers in Libraries*. 23 (4), 55–56
- Penka, J.T. (2003). The technological challenges of digital reference. *D-Lib*. Available:<http://www.dlib.org/dlib/february03/penka/02penka.html> (Accessed on20/6/2018)
- Pomerantz, J., & Luo, L. (2006). Motivations and uses: Evaluating virtual reference service from the users' perspective. *Library & information science research*, 28(3), 350-373.
- Pomerantz, J., Nicholson, S., Belanger, Y. &Lankes. R. D. (2004). The current state of digital reference: Validation of a general digital reference model through a survey of digital reference services. *Information Processing and Management*, 40, 347–363.
- Qobose, E. & Mologanyi, B. (2015). Evaluating Virtual Reference Service at University of Botswana Library: a case study of Question Point. A paper submitted at IFLA WLIC 2015, Cape Town

- Quadri, R. F & Abiodun, O.S. (2017) Availability and use of reference sources and services to federal polytechnic offa students, kwara state. *SCIREA Journal of Information Science and Systems Science*. Available at: <http://article.scirea.org/pdf/12009.pdf>. (Accessed on 30/1/2018)
- Radford, M. (2006). Encountering virtual users: A qualitative investigation of interpersonal communication in chat reference. *Journal of the American Society for Information Science and Technology* 57(8), 1046-1059.
- Radford, M. & Kern, M. (2006). A multiple-case study investigation of the discontinuation of nine chat reference services. *Library & Information Science Research* . 28, 521-547.
- Raghavan, A. (2000). 'Role of librarians: paradigm shifts – past to present.' CONSAL XI, April 26 – 28, Singapore: CONSAL
- Ramos, M.S. & Abrigo, C.M. (2012). Reference 2.0 in action: an evaluation of the digital reference services in selected Philippine academic libraries. *Library Hi Tech News*, 29(1), 8-20
- Robson, C. (2002). *Qualitative research methods borrowed from the social sciences*. Oxford: Blackwell. P34.
- Rodwell, J. (2001). Dinosaur or dynamo? The future for the subject specialist reference librarian. *New Library World*, 102 (1160/1161), 48-52.
- Roesch, H. (2006). Digital reference services: state of the art in the focus on quality. Paper presented at the 72nd IFLA General Council and Conference, August 20-24, 2006. Available at: <http://archive.ifla.org/IV/ifla72/papers/098-Roesch-en.pdf>. (Accessed on 1/2/2018)
- Reference and User Services Association (RUSA). (2004). *Guidelines for implementing and maintaining virtual reference services*. Available at: <http://www.ala.org/rusa>. (Accessed on 20/05/2018)
- Rubin, V. L., Chen, Y., & Thorimbert, L. M. (2010). Artificially intelligent conversational agents in libraries. *Library Hi Tech*, 28(4), 496-522.
- Ruppel, M., & Condit Fagan, J. (2002). Instant messaging reference: users' evaluation of library chat. *Reference services review*, 30(3), 183-197.

- RUSA (2010). Guidelines for Implementing and Maintaining Virtual Reference Services. Available at: <http://www.ala.org/rusa/sites/ala.org/rusa/files/content/resources/guidelines/virtual-reference-se.pdf> (Accessed 20/05/18)
- RUSA (2013). Guidelines for Behavioural Performance of Reference and Information Service Providers. Available at: <http://www.ala.org/rusa/resources/guidelines/guidelinesbehavioral>. (Accessed 20/05/18)
- RUSA, (2014). Virtual reference companion: a guide for VR coordinators and librarians. Available at: <http://www.ala.org/rusa/vrc> (Accessed 25/06/18)
- Saffady, W. (1995). Digital library concepts and technologies for the management of library collections: An analysis of methods and costs. *Library Technology Reports*, 31(3), 221-380
- Schement, J. R. ed. (2002). *Encyclopedia of communication and information*. New York: Gale Group.
- Sears, J. (2001). Chat reference service: An analysis of one semester's data. *Issues in science and technology librarianship*, Vol.32, 92001.
- Sekyere, K.(2011). Virtual reference service in academic libraries in West Africa. *Journal of Library and Information Services in Distance Learning*, 5(1-2), pp. 3-9.
- Shachaf, P. & Horowitz, S. (2008). Virtual reference service evaluation: adherence to RUSA behavioral guidelines and IFLA digital reference guidelines. *Library & Information Science Research*30, 122-137
- Shaw, K. & Spink, A. (2009). University Library virtual reference services: Best practices and continuous improvement. *Australian Academic & research Libraries*, 40 (3) 192 – 205
- Singh, D. (2012). Digital reference service in university libraries: a case study of the Northern India. *International Journal of Library and Information Studies*, 2,(4), 1-17.

- Smith, B. (2001). Enhancing reference services through technology. *Legal Reference Services Quarterly*, 19, 1-2, 133-146. doi.org/10.1300/J113v19n01
- Smith, L.C., 2010. Reference services. In: Encyclopedia of Library and Information Sciences. 3rd ed. [online]. New York: Taylor and Francis. pp. 4485-4491. Available at: <http://www.tandfonline.com/doi/book/10.1081/EELIS3?>
- Spata, A.V. (2003) Research Methods: Science and Diversity. New York: John Wiley and Sons, Inc. pp. 13,225.*special issue*. Reference and User Services Quarterly, 39(4),352-354.
- Strong, G. E. (2006). If we change it – will they come? *Reference Services Review*, 24, (3), 333-339.
- Tashakkori, A. & Creswell, J.W. (2007). The new era of mixed methods.*Journal of Mixed Methods Research*, 1(1), 3–7.
- Tedd, L. A. (2003). 'Challenges facing information professionals'. In Global knowledge renaissance. *The Australian Library Journal*, 51(1): 1-16.
- Trochim, W. M. K. (2006). *Philosophy of Research: Research methods knowledge base*. Available at: <http://libguides.usc.edu/content.php?pid=83009&sid=618409>. (Accessed on 23/5/2018)
- UniRank. (2016). Universities Ranking in Ghana. Available at: <https://www.4icu.org/reviews/1847.htm>. (Accessed on 27/11/2017)
- University of Cape Coast (2016) Fast-Fact UCC. Available at [:https://ucc.edu.gh/aboutus](https://ucc.edu.gh/aboutus). (Accessed on 27/11/2017)
- University of Ghana (2016) Enrolment and Graduation Statistics. Available at: <https://www.ug.edu.gh/about/enrolment-and-graduation-statistics>. (Accessed on 27/11/2017)
- Uutoni, W.E.(2014).Evaluation of digital reference services in academic libraries in Namibia. Master's thesis in library and information science. Swedish school of library and information science.

- Wasik, J. M. (1999). *Building and Maintaining Digital Reference Services*. ERIC Digest. Available at: <http://files.eric.ed.gov/fulltext/ED427794.pdf>. (Accessed on 20/11/2017)
- Weller, M. (2007). *Virtual learning environments: Using, choosing and developing your VLE*. Routledge
- Williams, A., Guise, N., Koonce, T., Kou, Q., & Guise, D. (2004). Using knowledge management practices to develop a statute-of-the-art digital library. *Medical Information, 11*,(1), 99-103.
- Williams Jr, R., Osei, C., & Omar, M. (2012). Higher education institution branding as a component of country branding in Ghana: Renaming Kwame Nkrumah University of Science and Technology. *Journal of Marketing for Higher Education, 22*(1), 71-81.
- Whitlatch, J. B. (2001) Evaluating Reference Services in the Electronic Age, *Library Trends, 50* (2), 207-217.
- Yonus, M. (2014) Digital Reference service in Pakistan University libraries. Available at:<https://dspace.lboro.ac.uk/2134/16> (Accessed on 14/11/2017)
- Zikmund, W. (2003).*Business Research Methods*.7th ed. Thousand Oaks: Sage Publication, p 56.

APPENDIX 1

QUESTIONNAIRE FOR DRS USERS AT UG, KNUST AND UCC

I am Miss Naomi Amofah-Serwaa, a post graduate Student at the University of Ghana, Legon offering MPhil in Information Studies. I am undertaking a research on the Digital Reference Service (DRS) in academic libraries in Ghana.

Dear User,

I would be grateful if you could answer the follow questions to enable me have a fair idea on the topic. I promise to protect your privacy as you assist me to undertake this study.

Thank you.

NOTE: Digital Reference Service (DRS) is the use of digital platforms such as Ask –a-librarian, text message, Telephone calls, email, Facebook messenger, Twitter handle, WhatsApp and other social media applications to seek information online from the library.

SECTION A: BIOGRAPHICAL DATA OF RESPONDENTS

1. Gender

Male []

Female []

2. User category

Student []

Faculty []

Private User []

3. Profession

Please indicate.....

4. Level of education

SHS [],

Tertiary []

SECTION B: REFERENCE SERVICE

5. What are the channels of reference services used for reference questions in your library?

Traditional Reference Service (TRS) [],

Digital reference service (DRS) []

Both TRS and DRS []

6. What is your preferred channel of reference services?

TRS [],

DRS []

7. Which DRS platform do you prefer in asking your reference questions?

Email [],

Ask-a-librarian []

Facebook Messenger,

Twitter Handle [],

Telephone Calls []

SECTION C: LEVEL OF AWARENESS

8. How did you get to know about DRS in your Library?

Library website [],

Library orientation [],

Word of mouth [],

Library guide []

9. Where do you access DRS

On-campus [],

Off-campus []

10. Do you get access to DRS after library hours?

Yes []

No []

SECTION D: USE OF DRS

11. Why do you use DRS?

I am off- campus []

To ask quick reference questions [],

I don't want to be physically present [],

I feel shy to ask some question []

12. How often do you use DRS for their queries

Occasionally [],

Regularly [],

Once a while []

Rarely []

13. What medium do you use to access?

Laptop [],

Mobile phone [],

Tablet []

14. What reference information do you request on DRS?

For Research consulting [],

For Ready Reference questions []

For Bibliographic verification [],

For Interlibrary loan []

For Readers advisory service []

For Instruction []

SECTION E: USER'S VIEW

15. Should DRS be replaced, integrated or separated from traditional reference service

(TRS).

Replaced [],

Integrated []

Separated []

16. Are you able to clarify your questions on DRS?
- Yes []
- No []
17. How long does it takes for your questions to be answered.
- Typically a day []
- Week []
- Hours [],
- 1-10 min []
18. Are you satisfied with the feedback received on DRS?
- Yes []
- No []
19. Have you been referred to other sources of information?
- Yes [],
- No []
20. Have you been referred to other libraries outside their institution for assistance?
- Yes [],
- No []
21. What is the first response you usually received from the library to demonstrate approachability?
- Hello how may we assist you [],
- Sorry none of the support team is available []
- No response [],
- Someone will be with you shortly [],
- Thank you without further response [].

22. Has the existence of DRS increased your use of library services?

Strongly disagreed []

Disagree [],

Neutral [],

Agreed [],

Strongly agreed []

23. DRS is useful?

Strongly disagreed [],

Disagree [],

Neutral [],

Agreed []

Strongly agreed []

SECTION F: TRAINING

24. Were you taught how to use DRS?

Yes []

No []

25. Do you undergo training on DRS?

Yes []

No []

SECTION G: MANAGEMENT OF DRS

26. Are you given user feedback survey to assess DRS at the end of every transaction?

Yes [],

No []

27. Are you allowed to rate DRS at end of the transaction?

Yes [],

No []

SECTION H: CHALLENGES IN THE USE OF DRS

28. Do you have internet challenges in accessing DRS?

Yes []

No []

29. Do you have challenges in the way the library answered their question?

Yes [],

No []

30. What challenges do you face using DRS?

Lack of prompt response [],

Inactivity after library hours [],

Unsatisfactory response [],

Internet challenge []

SECTION I: SUGGESTIONS AND RECOMMENDATIONS

31. Are DRS recommendable?

Strongly disagree [],

Disagree [],

Neutral [],

Agreed [],

Strongly agreed []

32. Suggest ways to improve DRS?

.....

APPENDIX 2

INTERVIEW FOR DRS LIBRARIANS AT UG, KNUST and UCC

I am Miss Naomi Amofah-Serwaa, a post graduate Student at the University of Ghana, Legon offering MPhil in Information Studies. I am undertaking a research on the Digital Reference Service (DRS) in academic libraries in Ghana.

Dear DRS librarian,

I would be grateful if you could help me answer the follow questions to enable me have a fair idea on the topic. I promise to protect your privacy as you assist me to undertake this study Thank you.

NOTE: Digital Reference Service (DRS) is the use of digital platforms such as Ask –a- librarian, text message, Telephone calls, email, Facebook messenger, Twitter handle, WhatsApp and other social media applications to seek information online from the library.

SECTION A: BIOGRAPHIC DATA

1. Gender
2. Job tenure
3. Rank

SECTION B: REFERENCE SERVICE

4. Types of Reference service in the library?
5. How many staff are in charge of DRS?
6. Should DRS replace, integrate, or be separated from DRS in the library?

SECTION C: TYPES OF DRS

7. What types of DRS do you provide in the library?
8. What are the DRS platforms used in the library?

SECTION D: AWARENESS AND USE OF DRS

9. How many staff are in charge of DRS
10. Are users aware of DRS?
11. How do you create user awareness?
12. How often do users visit DRS platform?
13. Does DRS close after library hours?

SECTION E: VIEWS OF LIBRARIAN

14. Should DRS replaced, integrated or separated from the traditional reference service?
15. Are users able to clarify their questions through DRS?
16. Do you follow up on users question with a telephone call or regular mail when users question is not clear on the DRS platform?
17. How long does it take to respond to users' queries?

18. Do you refer users to other sources of information when necessary?

19. Do you have any collaboration network with other DRS libraries?

SECTION F: TRAINING

20. Are users trained to use DRS platforms?

21. Do you undergo training on DRS?

22. Number of times you undergo training?

23. What infrastructures and technologies are used for DRS?

SECTION G: IMPLEMENTATION AND MANAGEMENT

24. Do you evaluate DRS at the end of every transaction?

25. Is there any other means of assessing DRS?

SECTION H: CHALLENGES OF DRS

26. What are some challenges in the use of DRS?

SECTION I: WAYS TO IMPROVE DRS

27. suggest ways to improve DRS

APPENDIX 3

INTERVIEW GUIDE FOR HEADS OF LIBRARY AT UG, KNUST and UCC

I am Miss Naomi Amofah-Serwaa, a post graduate Student at the University of Ghana, Legon offering MPhil in Information Studies. I am undertaking a research on the Digital Reference Service (DRS) in academic libraries in Ghana.

Dear Head librarian,

I would be grateful if you could help me answer the follow questions to enable me have a fair idea on the topic. I promise to protect your privacy as you assist me to undertake this study Thank you.

NOTE: Digital Reference Service (DRS) is the use of digital platforms such as Ask –a- librarian, text message, Telephone calls, email, Facebook messenger, Twitter handle, WhatsApp and other social media applications to seek information online from the library.

SECTION A: BIOGRAPHIC DATA

1. Gender
2. Job tenure
3. Rank

SECTION B: REFERENCE SERVICE

4. Types of Reference service in the library
5. How many staff are in charge of DRS
6. Should DRS replace, integrate, or be separated from DRS in the library
7. What types of DRS do you provide in the library?
8. What are the DRS platforms used in the library?

SECTION C: AWARENESS

9. How many staff are in charge of DRS
10. Are users aware of DRS?
11. How do you create user awareness?
12. Does DRS close after library hours?

SECTION D: VIEWS OF LIBRARIAN

13. Should DRS replaced, integrated or separated from the traditional reference service?

SECTION E: TRAINING

14. Are users trained to use DRS platforms?
15. Do DRS librarian undergo training on DRS?
16. Number of training in the year?

SECTION F: INFRASTRUCTURE AND TECHNOLOGIES

17. Who provides infrastructures?
18. Year of implementation of DRS in the library?
19. How do you manage DRS in the library?

SECTION G: MANAGEMENT OF DRS

Are there available funds in support of DRS?

Do you evaluate DRS at the end of every transaction or at a certain point in time?

Are there any other means of assessing DRS?

SECTION H: CHALLENGES OF DRS

What are some challenges in the use of DRS?

SECTION I: WAYS TO IMPROVE DRS

Suggest ways to improve DRS

APPENDIX 4

INTERVIEW GUILDE FOR HEADS OF IT AT UG, KNUST and UCC

I am Miss Naomi Amofah-Serwaa, a post graduate Student at the University of Ghana, Legon offering MPhil. in Information Studies. I am undertaking a research on the Digital Reference Service (DRS) in academic libraries in Ghana.

Dear IT Staff,

I would be grateful if you could me have a fair view on the topic. I promise to protect your privacy as you assist me to undertake this study. I would also need your assistance by providing contact address of users in other to solicit their views about DRS in your library.

Thank you.

NOTE: Digital Reference Service (DRS) is the use of digital platforms such as Ask –a- librarian, text message, Telephone calls, email, Facebook messenger, Twitter handle, WhatsApp and other social media applications to seek information online from the library.

SECTION A: BIOGRAPHIC DATA

1. Gender
2. Job tenure
3. Rank

SECTION B: REFERENCE SERVICE

4. What types of DRS do you provide in the library?
5. What are the DRS platforms used in the library?

SECTION C: AWARENESS

6. How often do users visit DRS platform?
7. Does DRS close after library hours?

SECTION D: VIEWS OF IT STAFF

8. Should DRS replaced, integrated or separated from the traditional reference service?

SECTION E: TRAINING

9. Do you train DRS librarian on DRS?
10. Number of times they undergo training?

SECTION F: INFRASTRUCTURE AND TECHNOLOGIES

11. What infrastructures are used in the implementation of DRS?
12. Technology used for DRS?
13. Who provides infrastructures?

SECTION G: IMPLEMENTATION AND MANAGEMENT OF DRS

14. Year of implementation of DRS in the library
15. How do you manage DRS in the library?
16. Do you evaluate DRS at the end of every transaction or at a certain point in time?
17. Is there any other means of assessing DRS?

SECTION H: CHALLENGES OF DRS

18. What are some challenges in the use of DRS?

SECTION I: WAYS TO IMPROVE DRS

19. Suggest ways to improve DRS