

**DETERMINANTS OF USE OF NEW MEDIA IN  
SCHOLARLY COMMUNICATION BY ACADEMIC STAFF  
IN PUBLIC UNIVERSITIES IN KENYA**

**MASAYA, HILLARY CHAKAVA**

**DOCTOR OF PHILOSOPHY  
(Mass Communication)**

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE  
AND TECHNOLOGY**

**2019**

**Determinants of Use of New Media in Scholarly  
Communication by Academic Staff in Public Universities in  
Kenya**

**Masaya, Hillary Chakava**

**A Thesis Submitted in Partial Fulfilment of the Degree of Doctor of  
Philosophy In Mass Communication of Jomo Kenyatta University of  
Agriculture And Technology**

**2019**

## DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

Signature..... Date.....

Masaya Hillary Chakava

This thesis has been submitted for examination in its present form with our approval as University Supervisors:

Signature..... Date.....

Prof. Hellen K. Mberia

JKUAT, Kenya

Signature..... Date.....

Dr. George Gatero

JKUAT, Kenya

## **DEDICATION**

This thesis is dedicated to my mother Beatrice Alivitsa Chakava who, as a single mother, gave herself whole heartedly to see to it that me and my siblings could come this far. I also dedicate this work to my late brother, Dr. George Chakava, who would have loved to read this thesis had he been alive today.

This is to you Larry Joram Chakava and Jeremy Rugenyi Chakava for giving me the inspiration to keep on pushing even when the going was tough. Daddy loves you.

## **ACKNOWLEDGEMENT**

First and foremost, I would like to acknowledge my supervisors Prof. Hellen Mberia and Dr. George Gatero for their dedicated and very useful academic guidance at every stage of writing this thesis. I would not have come this far without their willingness to walk with me through reading through my work and offering helpful insights that shaped this study. I am also grateful to all the lecturers and staff in the Department of Media Technology and Applied Communication for their academic support.

I wish to thank all the Vice-Chancellors of the University of Nairobi, Kenyatta University, Jomo Kenyatta University of Agriculture and Technology, Moi University and Egerton University for allowing me to collect data from these esteemed institutions. I am also grateful for all the academic staff from these five universities who agreed to participate in the study by answering the questionnaire. To my research assistants Jackson Karanja and Annette Akoth I say thank you so much. Thank you so much Dr. Henry Chakava for opening your library to me and for inspiring me at every step. I wish to also thank Sabatia Constituency Development Fund for believing in me and funding part of my PhD coursework and East African Educational Publishers for inviting me to contribute some of the findings of this thesis in an international book project as a chapter co-author.

I cannot forget the support I received from my lovely wife Ruth and our two sons Larry and Jeremy even when I was away from home for extended periods. All my siblings also supported me immensely in the course of writing this thesis. Finally, I give all glory to the Almighty God who gave me grace and strength to complete this work.

## TABLE OF CONTENTS

<b>DECLARATION.....</b>	<b>iii</b>
<b>DEDICATION.....</b>	<b>iv</b>
<b>ACKNOWLEDGEMENT.....</b>	<b>v</b>
<b>TABLE OF CONTENTS.....</b>	<b>vi</b>
<b>LIST OF TABLES .....</b>	<b>xi</b>
<b>LIST OF FIGURES .....</b>	<b>xiv</b>
<b>LIST OF APPENDICES .....</b>	<b>xv</b>
<b>LIST OF ACRONYMS .....</b>	<b>xvi</b>
<b>OPERATIONAL DEFINITION OF TERMS.....</b>	<b>xviii</b>
<b>ABSTRACT .....</b>	<b>xxi</b>
<b>CHAPTER ONE .....</b>	<b>1</b>
<b>INTRODUCTION.....</b>	<b>1</b>
1.1 Background to the Study.....	1
1.2 Statement of the Problem.....	4
1.3 Objectives of the Study .....	5
1.4 Research Hypotheses .....	6
1.5 Significance of the Study .....	6
1.6 Scope of the Study .....	10
1.7 Limitations of the Study.....	11
<b>CHAPTER TWO .....</b>	<b>14</b>
<b>LITERATURE REVIEW.....</b>	<b>14</b>
2.1 Introduction.....	14
2.2 Theoretical Review .....	14
2.2.1 <i>Unified Theory of Acceptance and Use of Technology</i> .....	14
2.2.2 <i>Uses and Gratifications Theory</i> .....	20
2.3 Conceptual Framework .....	23
2.4 Review of variables.....	26
2.4.1 <i>Performance Expectancy of New Media</i> .....	26
2.4.2 <i>Effort Expectancy of New Media</i> .....	27
2.4.3 <i>Social Influence of New Media</i> .....	28
2.4.4 <i>Facilitating Conditions of use of New Media</i> .....	30

2.4.5 <i>Personal Factors and Use of New Media</i> .....	34
2.5 Scholarly Communication.....	35
2.5.1 <i>Evolution of scholarly communication</i> .....	38
2.5.2 <i>The State of Scholarly Communication in Africa</i> .....	38
2.5.3 <i>The Status of Scholarly Communication in Kenya</i> .....	41
2.5.4 <i>The Role of University Presses in Kenya's Scholarly Communication</i> .....	44
2.5.5 <i>Use of New Media in Scholarly Communication</i> .....	46
2.6 Empirical Review of Relevant Studies .....	49
2.7 Critical Review of Existing Literature .....	52
2.8 Research Gap .....	54
2.9 Summary of Literature Review .....	55
<b>CHAPTER THREE .....</b>	<b>57</b>
<b>METHODOLOGY.....</b>	<b>57</b>
3.1 Introduction .....	57
3.2 Research Design.....	57
3.3 Target Population.....	57
3.4 Sampling Frame .....	58
3.5 Sample Size and Sampling Techniques .....	58
3.5.1 <i>Universities</i> .....	59
3.5.2 <i>Lecturers</i> .....	60
3.6 Data Collection Instruments.....	63
3.7 Data Collection Procedure .....	65
3.8 Validity and Reliability of Research Instruments .....	66
3.8.1 <i>Validity</i> .....	66
3.8.2 <i>Reliability</i> .....	67
3.9 Pilot Testing.....	67
3.10 Data Processing and Analysis .....	68
3.10.1 <i>Isolating factors associated with use of new media in scholarly communication</i> .....	70
3.11 Assumptions of the Regression Model .....	74
3.11.1 <i>Linearity</i> .....	74
3.11.2 <i>Reliability Test</i> .....	74

3.11.3 Testing for Normality .....	74
3.12 Measurement of Variables .....	74
3.12.1 Measurement of Independent Variables.....	75
3.12.2 Measurement of Moderating Variables .....	75
3.12.3 Measurement of the Dependent Variable.....	75
<b>CHAPTER FOUR.....</b>	<b>76</b>
<b>FINDINGS AND DISCUSSION .....</b>	<b>76</b>
4.1 Introduction .....	76
4.2 Preliminary Analysis of Results.....	76
4.2.1 Response Rate .....	76
4.2.2 Age and Gender of Respondents .....	77
4.2.3 University of Respondents and their Current Rank .....	78
4.2.4 Participation in Scholarly Communication .....	80
4.2.5 New media tools preferred for scholarly communication.....	82
4.3 Descriptive Statistics.....	86
4.3.1 Influence of Performance Expectancy on Use of New Media in Scholarly Communication .....	86
4.3.2 Influence of Effort Expectancy on Use of New Media in Scholarly Communication .....	90
4.3.3 Effect of Social Influence on Use of New Media in Scholarly Communication .....	94
4.3.4 The Influence of Facilitating Conditions on Use of New Media in Scholarly Communication .....	98
4.4 Influence of Personal Factors on Use of New Media in Scholarly Communication .....	103
4.4.1 Relationship between Age and Use of New Media in Scholarly Communication .....	104
4.4.2 Relationship between Gender and Use of New Media in Scholarly Communication .....	107
4.4.3 Relationship between Academic Rank and Use of New Media in Scholarly Communication .....	109
4.4.4 Relationship between Attitude and Use of New Media in Scholarly Communication .....	111
4.4.5 Relationship between Anxiety and Use of New Media in Scholarly Communication .....	115



4.5 Predictors of Use of New Media in Scholarly Communication.....	120
4.5.1 Bivariate analysis of factors associated with use of new media tools in scholarly communication .....	122
4.5.2 Factors associated with use of new media tools in scholarly communication 125	
4.5.3 Isolating factors associated with use of new media in scholarly communication .....	127
4.6 Hypotheses Testing .....	130
4.6.1 Hypothesis testing on relationship between performance expectancy and use of new media in scholarly communication.....	132
4.6.2 Hypothesis testing on relationship between effort expectancy and use of new media in scholarly communication .....	134
4.6.3 Hypothesis testing on relationship between social influence and use of new media in scholarly communication .....	135
4.6.4 Hypothesis testing on relationship between facilitating conditions and use of new media in scholarly communication.....	136
4.6.5 Hypothesis testing on the moderating influence of personal factors on the relationship between independent variables and use of new media in scholarly communication .....	137
4.6.6 Hypotheses testing on combined variables under investigation .....	140
4.7 Conclusion .....	142
<b>CHAPTER FIVE.....</b>	<b>144</b>
<b>SUMMARY, CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>144</b>
5.1 Introduction .....	144
5.2 Summary of the Study.....	144
5.3 Conclusions of the Study .....	145
5.3.1 Influence of performance expectancy on use of new media in scholarly communication .....	146
5.3.2 Influence of effort expectancy on use of new media in scholarly communication .....	147
5.3.3 Influence of social influence on use of new media in scholarly communication .....	148
5.3.4 Influence of facilitating conditions on the use of new media in scholarly communication .....	149
5.3.5 Moderating Influence of personal factors on the relationship between the independent variables and the use of new media in scholarly communication .....	150

5.4 Summary of Hypothesis Testing.....	154
5.5 Recommendations of the Study .....	155
5.6 Recommendations for Further Research.....	158
<b>REFERENCES.....</b>	<b>160</b>
<b>APPENDICES .....</b>	<b>174</b>

## LIST OF TABLES

<b>Table 1.1:</b> Total scholarly publications from selected African countries between 1996-2009.....	41
<b>Table 1.2:</b> Most productive scholarly institutions in Eastern Africa.....	43
<b>Table 1.3:</b> Output of scholarly publications from Kenya (1996-2009).....	44
<b>Table 3.1:</b> Lecturers' sampling matrix.....	63
<b>Table 3.2:</b> Data processing matrix.....	69
<b>Table 4.1:</b> Percentage distribution of respondents .....	77
<b>Table 4.2:</b> Percentage distribution of respondents according to their university .....	78
<b>Table 4.3:</b> Highest level of education attained by respondents .....	79
<b>Table 4.4:</b> Forms of scholarly communication respondents had participated in.....	81
<b>Table 4.5:</b> Frequency of use of new media tools in scholarly communication .....	83
<b>Table 4.6:</b> Levels of frequency of use of new media in scholarly communication.....	85
<b>Table 4.7:</b> Performance expectancy of new media in scholarly communication.....	87
<b>Table 4.8:</b> Levels of performance expectancy.....	89
<b>Table 4.9:</b> Relationship between performance expectancy and frequency of use of new media .....	90
<b>Table 4.10:</b> Effort expectancy of new media in scholarly communication.....	91
<b>Table 4.11:</b> Levels of effort expectancy.....	93
<b>Table 4.12:</b> Relationship between effort expectancy and frequency of use of new media .....	94
<b>Table 4.13:</b> Effect of social influence on use of new media in scholarly communication .....	95
<b>Table 4.14:</b> Levels of social influence.....	97
<b>Table 4.15:</b> Relationship between social influence and use of new media tools .....	98
<b>Table 4.16:</b> Effect of facilitating conditions on use of new media in scholarly communication.....	100
<b>Table 4.17:</b> Levels of influence of facilitating conditions.....	102
<b>Table 4.18:</b> Relationship between facilitating conditions and frequency of use of new media in scholarly communication .....	103

<b>Table 4.19:</b> Descriptive statistics of use of new media index score in the four groups	104
<b>Table 4.20:</b> ANOVA comparing use of new media mean scores across age categories	105
<b>Table 4.21:</b> Spearman's Rho correlation coefficient	106
<b>Table 4.22:</b> Percentage distribution of respondents by frequency of use of new media in scholarly communication according to age	107
<b>Table 4.23:</b> Frequency of use mean scores across gender of teaching staff	108
<b>Table 4.24:</b> Relationship between gender and use of new media in scholarly communication	109
<b>Table 4.25:</b> Descriptive statistics of frequency of use index score in the current academic position	109
<b>Table 4.26:</b> ANOVA comparing frequency of use mean scores across current position of respondents	110
<b>Table 4.27:</b> Academic position and use of new media tools	111
<b>Table 4.28:</b> Attitude towards use of new media in scholarly communication	112
<b>Table 4.29:</b> Levels of influence of attitude on use of new media on scholarly communication	113
<b>Table 4.30:</b> Correlation of attitude and frequency of use of new media in scholarly communication	115
<b>Table 4.31:</b> Relationship between attitude and frequency of use of new media in scholarly communication	115
<b>Table 4.32:</b> Effect of anxiety on use of new media in scholarly communication	117
<b>Table 4.33:</b> Levels of influence of anxiety about using new media	118
<b>Table 4.34:</b> Correlation of anxiety and frequency of use of new media	119
<b>Table 4.35:</b> Distribution of anxiety and frequency of use of new media	120
<b>Table 4.36:</b> Significant independent variables with dependent variable	121
<b>Table 4.37:</b> Percentage distribution of respondents by level of use of new media tools and selected personal characteristics	123

<b>Table 4.38:</b> Percentage of respondents according to level of use by performance expectancy, effort expectancy, social influence and influence of facilitating conditions .....	124
<b>Table 4.39:</b> Logistic regression .....	126
<b>Table 4.40:</b> Hypothesis testing.....	133
<b>Table 4.41:</b> Moderating effect of personal factors on the relationship between independent variables and the dependent variable .....	138
<b>Table 4.42:</b> Combined model fitness tests .....	140

## LIST OF FIGURES

<b>Figure 1.1:</b> UTAUT Model .....	16
<b>Figure 2.1:</b> Relationship between variables in this study.....	25
<b>Figure 2.2:</b> Process of Scholarly Communication.....	37
<b>Figure 4.1:</b> Gender of respondents .....	78
<b>Figure 4.2:</b> Percentage distribution of respondents according to rank.....	79
<b>Figure 4.3:</b> Format of publication .....	82

## **LIST OF APPENDICES**

<b>Appendix I:</b> Introductory Letter .....	174
<b>Appendix II:</b> Questionnaire for Lecturers.....	175
<b>Appendix III:</b> Initial Scale Items Based of the Original Work of Venkatesh et al (2003) .....	181
<b>Appendix IV:</b> Research Permit .....	183
<b>Appendix V:</b> Approval Letter from JKUAT .....	184
<b>Appendix VI:</b> Original Scores of Variables before Recoding .....	185

## **LIST OF ACRONYMS**

<b>ABC</b>	African Books Collective
<b>AJOL</b>	African Journals Online
<b>AMREF</b>	African Medical Research Foundation
<b>APNET</b>	African Publishers Network
<b>CUE</b>	Commission for University Education
<b>ICIPE</b>	International Centre for Insect Physiology and Ecology
<b>ICT</b>	Information, Communication Technology
<b>ILRI</b>	International Livestock Research Institute
<b>INASP</b>	International Network for the Availability of Scientific Publications
<b>JKUAT</b>	Jomo Kenyatta University of Agriculture and Technology
<b>KARI</b>	Kenya Agricultural Research Institute
<b>KNLS</b>	Kenya National Library Services
<b>KPD</b>	Kenya Periodicals Directory
<b>KPA</b>	Kenya Publishers Association
<b>KU</b>	Kenyatta University
<b>NACOSTI</b>	National Commission for Science and Technology Innovation
<b>OA</b>	Open Access
<b>OAI</b>	Open Archives Initiative
<b>PEOU</b>	Perceived Ease of Use
<b>POD</b>	Print on Demand
<b>PU</b>	Perceived Usefulness
<b>SAPs</b>	Structural Adjustment Programmes
<b>SNS</b>	Social Networking Site
<b>SPSS</b>	Statistical Packages for Social Sciences
<b>STI</b>	Scientific and Technological Innovation
<b>TAM</b>	Technology Acceptance Model
<b>Tz</b>	Tanzania
<b>UGT</b>	Uses and Gratifications Theory
<b>UK</b>	United Kingdom
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization



<b>UoN</b>	University of Nairobi
<b>UTAUT</b>	Unified Theory of Acceptance and Use of Technology

## **OPERATIONAL DEFINITION OF TERMS**

<b>Acceptance of new media:</b>	The decision by university lecturers to embrace the use of e-mail, blogs, miniblogs, wikis, RSS and online documents in their scholarly communication activities.
<b>Academic staff:</b>	These are lecturers teaching in public universities and engaging in scholarly communication. They may be employed on part-time or full-time basis and range from teaching assistants, tutorial fellows, lecturers, senior lecturers, associate professors and full professors.
<b>Blogs:</b>	These are online Web journals used by scholars to converse about their scholarship, viewpoint, or idea in their given areas of specialization.
<b>Effort expectancy:</b>	The degree of ease associated with the use of new media in scholarly communication or the degree to which lecturers believe that using new media in scholarly communication would be free from effort
<b>E-journals:</b>	Publications by universities and academic staff which are created and distributed online and are not printed.
<b>Facilitating conditions:</b>	The degree to which lecturers in public universities believe that an organisational and technical infrastructure exists to support their use of new media in their scholarly communication activities.
<b>New media:</b>	New media are taken to be those methods and social practices of communication, representation, and expression that have developed using the digital, multimedia, networked computer. They include online documents, blogs, miniblogs, RSS, wikis and social media applications that are used in scholarly communication.

<b>Online documents:</b>	These are any scholarly publications that can be accessed on the Internet and which include e-journals, e-books, bibliographies, e-newspapers, etc. These are consulted regularly by university scholars. In addition, some university scholars publish their research in these platforms.
<b>Performance expectancy:</b>	Refers to the degree to which an individual believes that using new media in scholarly communication will help him or her to attain gains in their scholarly communication activities.
<b>Peer review:</b>	The process of critiquing a written work of scholarship by another scholar to ascertain its quality and contribution to the work of scholarship in the field.
<b>Personal Factors:</b>	The personal factors identified in this study based on the UTAUT model include attitude, anxiety, gender, age, scholarly rank and educational qualifications. UTAUT suggests that the effect of the four key constructs (performance expectancy, effort expectancy, social influence and facilitating conditions) is moderated by four other variables: age, gender, experience and voluntariness of use.
<b>Public university:</b>	These are universities owned and funded by the government of Kenya.
<b>Researchers:</b>	These are scholars involved in the process of creation and dissemination of new knowledge within public universities using various media.
<b>Scholarly communication:</b>	This term describes the process of sharing and publishing research works and outcomes. In this study, scholarly communication refers to academic work either presented in informal networks like social media, in semi-formal forums

like conferences and pre-prints, or published in formal publications called scientific journals. For this study, the terms scholarly communication and scholarly publishing are used interchangeably to refer to the same.

**Scholarly journal:**

A publication in which original works of academic nature written by university academic staff are published to be read by their peers. For this study, these involve both hard copy journals as well as e-journals.

**Social influence:**

The degree to which a lecturer perceives that important others believe he or she should use new media in scholarly communication.

**University press:**

Publishing units established and run by universities to source, prepare and publish scientific works by scholars in the particular university and sometimes outsiders whose works have an impact on specific areas of scholarly interest.

**Wikis:**

Wikis are community encyclopedias where any scholar can add or edit the content of a listing online; including scholarly works by university academic staff.

## ABSTRACT

Scholarly communication is integral to the research process and to the development of knowledge. Traditionally, research has been published in print journals which continue to be the preferred channel, especially in developing countries like Kenya. Lately, the academic publishing industry is grappling with disruption brought about by digital media. Scholarly communication is changing with the growth of new media technologies and these changes are impacting on all members of the academic community and on how they go about creating and maintaining scholarship. The aim of this study was to establish the determining factors for use of new media technologies in conducting scholarly communication activities among the academic community in Kenya's public universities. The specific objectives of the study were: To examine the influence of performance expectancy on the use of new media in scholarly communication by university academic staff in Kenya; To establish the influence of effort expectancy on the use of new media in scholarly communication by university academic staff in public universities in Kenya; To identify the effect of social influence on the use of new media in scholarly communication by university academic staff in Kenya; To evaluate the influence of facilitating conditions on the use of new media in scholarly communication by university academic staff in Kenya; and to To determine the moderating influence of personal factors on the use of new media technologies in scholarly communication by university academic staff. The study used the unified theory of acceptance and use of technology (UTAUT) and the uses and gratifications theory (UGT) as a theoretical basis to conduct empirical research testing of the determinants of use of new media technologies in scholarly communication by university lecturers. This was a quantitative survey research. The study population comprised lecturers in public universities in Kenya. The target population for the survey was drawn from lecturers from five selected universities which included University of Nairobi, Kenyatta University, Moi University, Jomo Kenyatta University of Agriculture and Technology, and Egerton University. A self-administered questionnaire was distributed to the lecturers in the five universities for data collection. Findings of the study were analysed using Statistical Programmes for Social Sciences Version 22. A bivariate analysis of factors associated with use of new media in scholarly communication revealed that among personal variables, only *Age of the Respondent* and *Level of Attitude* were statistically associated with level of use. The study concludes that performance expectancy, effort expectancy, social influence and anxiety were significant determinants of use of new media in scholarly communication when considered separately. Further, a logistic regression model was fitted using all the independent variables that were statistically associated with the dependent variable, which were: Age of the Respondent; Level of Attitude; Level of performance expectancy; Level of effort expectancy; Level of social influence; and Level of anxiety in using new media. However, only performance expectancy was found to be a significant determinant of use of new media in scholarly communication when all the variables were considered as a block. Personal factors were found not to have a significant moderating influence on the relationship between the dependent variable and the independent variables. The study recommended that to enhance the use of new media in scholarly communication by university lecturers in Kenya, there is need to invest in more diverse new media technologies at the institutional

and national level. Admitting the use of new media technologies in scholarly communication has the potential to put Kenya on the world map in terms of research dissemination.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background to the Study**

Scholarly communication and the whole academic publishing cycle in Kenya is grappling with disruption brought about by digital new media which is redefining how research is created and disseminated. We are living in a knowledge economy where meaningful development is driven by research. Critical to the research process is the dissemination of the research findings to professionals who then use the outcomes to address various problems. In a knowledge economy, scholarly communication is viewed as one way of producing, sharing and distributing new knowledge. New media and its technical possibilities have resulted in a number of tendencies with mixed implications for scholarly communication (Werf-Davelaar, 2010).

Unfortunately, Africa remains marginalized in the global knowledge arena because of low scholarly publishing activity deriving from a low research output. African nations consume far more knowledge from centres of knowledge production outside their borders than they produce and disseminate (Ilieva and Chakava, 2016). Even research on Africa and knowledge about Africa is more often produced and published outside Africa. This perpetuates 'relations of dominance of Africa by the West' (Zeleza, 1994). To come out of this state of subordination, African people require home grown knowledge that is relevant to their experiences and aspirations. This means that modern African societies will develop as a result of having access to relevant research outcomes disseminated through relevant scholarly communication channels. To this end, new media technology is increasingly playing a major role in how research is created and disseminated, especially in the developed nations of the world.

Today, scholarly communication is taking on new models because of new media technologies which have transformed how knowledge is created and disseminated. This environment has encouraged the emergence of novel publishing models for formal and

informal communication among scientists, using internet technologies for the dissemination and communication of research findings, with capabilities which exceed those of print technologies by far (Werf-Davelaar, 2010). These new electronic publishing models based on self-archiving, have revolutionised scholarly communication and rendered it more efficient and effective especially in the developed world (Vrana, 2011).

To remain relevant, Kenyan academics will need to find newer ways of making their scholarly work accessible. New media can help eliminate the challenges of research availability and accessibility (Gu and Widen-Wulff, 2010). With new media technologies, researchers have more options when they develop their scholarly communication by new information behaviours, which extend and enrich the meaning and the environment of social media (Beer, 2008). New media tools underline features such as openness, interactivity, participatory, and user-centred activities. Indeed, the development of the internet has had great implications on research dissemination and scholarly communication (Walsh et al, 2000); especially in the areas of accessibility, availability and performance. The exploding growth of information has forced individual researchers to become specialised in adjusting to specialised research dissemination forums. Although the distribution of scientific information has retained part of its traditional structures, the ways of scholarly communication and research dissemination have been substantially affected via more convenience, availability and low cost of production of information via new media (Meadows, 2003).

On the other hand, Kenya's Vision 2030 proposes intensified application of science, technology and innovation (STI) to raise productivity and efficiency levels across the three pillars of the Vision; Economic, Social and Political. The Vision recognises the role of STI in a modern economy, in which new knowledge plays a central role in wealth creation, social welfare and international competitiveness. Kenya intends to become a knowledge-led economy wherein, the creation, adaptation and use of knowledge will be among the most critical factors for rapid economic growth (Government of Kenya, 2007). This,



therefore, calls for a sustained research activity in science and technology and the dissemination of resultant knowledge to user groups. A highly developed and reliable scholarly communication infrastructure is required to perform this role effectively and to deliver the Vision. Unfortunately, studies have revealed that most African Universities have not taken strategic approaches to scholarly communication nor utilised appropriate ICTs and new media technologies to broaden the reach of their scholarly work. As a result, the impact and visibility of African research output remains low (Trotter et al, 2014).

Kenya has one of the most vibrant scholarly communication activity in Africa attributed to a more advanced research culture and better scholarly publishing infrastructure (Darko-Ampem, 2003). Consequently, Kenya's research output in scientific publications has been on the rise over the last decade. This rise has been attributed to a thirst for education and improvement of technology (Flipsen, 2013; UNESCO, 2015). However, this scholarly communication activity is still very insignificant compared against the world research output; averaging just about 0.06% as indicated in a report by the International Network for the Availability of Scientific Publications (INASP, 2012; UNESCO, 2015).

According to Metcalfe & Esseh, (2009), the increasing use of new media and online publishing systems as well as Open Access publishing models holds some promise of increasing access to research published in Kenya. Even though the opportunity of giving their publications global visibility through new media technologies has been made possible, the extent to which scholars in Kenya have embraced new media in disseminating their works of scholarship had been largely unknown. Another important question is whether lecturers and researchers in Kenya believe that new media technologies provide a better environment for better performance of their scholarly communication. This study sought to establish the determinants of use of new media technologies in scholarly communication by academic staff in selected public universities in Kenya.

## **1.2 Statement of the Problem**

Kenya has seen many improvements in scholarly communication and professional standards during the last decade, particularly through the work of the African Publishers Network (APNET), African Journals Online (AJOL), International Network for the Availability of Scientific Publications (INASP), Council for the Development of Social Science Research in Africa (CODESRIA) and Database of African Theses and Dissertations (DATAD) (Ikoja-Odongo, 2009). However, few Kenyan commercial publishers publish scientific works, leaving this important function instead to university presses, research organisations and individual researchers. Another concern is that only a handful of public and private universities in Kenya have active publishing presses. Those with presses often lack adequate technical capacity to handle manuscripts. As a result, university press publishing has remained weak and the significance of universities as centers for research has declined due to the drying up of funding for higher education in successive years (Mazrui, 2005; Ilieva and Chakava, 2016). This is caused by the fact that the market for scholarly publications is considered too small to be attractive to larger commercial publishers. Smaller, local publishers are unable to survive on scientific publishing only.

Consequently, Kenya still lags behind in research publishing and heavily relies on foreign countries for almost all forms of knowledge (Makotsi, 1998, Darko-Ampem, 2003, Ilieva & Chakava, 2016; UNESCO, 2015). Kenyan scholars also heavily depend on developed countries for assessment and publication of their scholarly works. However, studies show that new media technologies can help overcome this scholarly information divide (Gu and Widen-Wulff, 2010; Vrana, 2011). With new media technologies, researchers have more options when they develop their scholarly communication by new information behaviours, which extend and enrich the meaning and the environment of new media (Beer, 2008). Kenyan scholars and researchers have been slow in adopting and using new media technologies for creating and disseminating their works of scholarship. As a result, the visibility of Kenya's research output in comparison with the developed world remains

low, averaging to less than 0.6% of the world research output (INASP, 2012; UNESCO, 2015; Ilieva & Chakava, 2016). This study, therefore, sought to explore the determinants of use of new media in scholarly communication among Kenyan scholars in addressing these challenges of availability and accessibility of Kenya's scholarly communication output.

### **1.3 Objectives of the Study**

#### **1.3.1 General objective**

The general objective of the study was to examine the determinants of use of new media in scholarly communication among university academic staff in public universities in Kenya.

#### **1.3.2 Specific objectives**

The specific objectives of the study were:

1. To examine the influence of performance expectancy on the use of new media in scholarly communication by university academic staff in public universities in Kenya;
2. To establish the influence of effort expectancy on the use of new media in scholarly communication by university academic staff in public universities in Kenya;
3. To identify the effect of social influence on the use of new media in scholarly communication by university academic staff in public universities in Kenya;
4. To evaluate the influence of facilitating conditions on the use of new media in scholarly communication by university academic staff in public universities in Kenya; and to
5. To determine the moderating influence of personal factors on the use of new media technologies in scholarly communication by university academic staff in public universities in Kenya.

## **1.4 Research Hypotheses**

The study sought to test the following hypotheses:

1.  $H_0$  There is no relationship between performance expectancy and the use of new media in scholarly communication by university academic staff in Kenya;  
 $H_1$  There is a relationship between performance expectancy and the use of new media in scholarly communication by university academic staff in Kenya;
2.  $H_0$  There is no relationship between effort expectancy and the use of new media in scholarly communication by university academic staff in public universities in Kenya;  
 $H_1$  There is a relationship between effort expectancy and the use of new media in scholarly communication by university academic staff in public universities in Kenya;
3.  $H_0$  There is no relationship between social influence and use of new media in scholarly communication by university academic staff in Kenya;  
 $H_1$  There is a relationship between social influence and use of new media in scholarly communication by university academic staff in Kenya;
4.  $H_0$  There is no relationship between facilitating conditions and the use of new media in scholarly communication by university academic staff in Kenya;  
 $H_1$  There is a relationship between facilitating conditions and the use of new media in scholarly communication by university academic staff in Kenya;
5.  $H_0$  There is no relationship between personal factors and use of new media technologies in scholarly communication by university academic staff.  
 $H_1$  There is a relationship between personal factors and use of new media technologies in scholarly communication by university academic staff.

## **1.5 Significance of the Study**

In 2006, the ministry of Education, Science and Technology established a national ICT strategy for education and training (2006). The strategy was meant to guide ICT investments in the education sector and private-public partnerships framework to mobilise

resources for increased ICT adoption (Ministry of Education, Science and Technology). Based on Sessional Paper No.1 of 2005 (Republic of Kenya, 2005), the Ministry of Education has had the intention to integrate ICTs in order to improve quality of education. This was to ensure that education and training service provision and delivery utilise modern ICT tools, which include new media technologies.

According to Sessional Paper No 14 of 2012 (Republic of Kenya, 2013), the vision for the University sub-sector is to provide globally competitive quality education, training, and research for sustainable development. While universities are charged with the mandate of training manpower, the quality of teaching and research as well as the dissemination avenues available for the research outcomes will determine the realisation of such efforts. Therefore, ICT and new media provide opportunities for university researchers and lecturers to interact with one another more effectively during formal and informal scholarly communication, and to interact with consumers of their research outcomes. For this reason, universities in Kenya need to integrate ICTs and new media into their agendas to enhance quality of scholarly communication and research activities. This study was significant in establishing how new media and allied ICTs have influenced scholarly communication the selected universities in Kenya and the factors which determine whether lecturers who engage in scholarly communication accept to use new media or not.

There have been several studies conducted to justify the need to direct attention on the integration of ICT in Primary and Secondary Schools in Kenya. Other studies have shown a growing interest in using new media and ICTs in distance education (Gakuu, 2006). A survey carried out by KENET (2009) indicated that universities in Kenya are ready to use ICT in teaching and learning but the study was silent on the preparedness to use ICT and new media in scholarly communication activities involving dissemination of research outcomes. Consequently, little information is available on the influence of new media in enhancing the quality of scholarly communication in Kenyan universities, especially in terms of availability and accessibility of research outcomes. The current study was

significant because it will prepare universities to align their resources towards enhancing their preparedness to use new media in research dissemination.

This study established the key determinants of acceptance and use of new media in scholarly communication among lecturers in public universities in Kenya. The researcher reviewed preliminary relevant literature on scholarly communication and new media around the globe. It was noted that whereas a lot has been written on this subject around the world, there is very little written about the media of scholarly communication in Kenya. Much of the published work is in the area of institutional digital repositories and open access to works of scholarship. Of much concern is the apparent lack of proper documentation of the extent of scholarly communication activity in Kenya. The Kenya National Library Services (KNLS), through its Kenya Periodicals Directory (KPD), lists just about eleven journals and has not been updated since 2011 (KNLS, Website, accessed, 2017). Scholars like Chakava (2007), Darko-Ampem (2003) and Makotsi (1998) have written on scholarly publishing in Kenya but they have not delved into the role of new media technologies in scholarly communication in Kenya. This study was therefore significant in addressing this research gap in the area of use of new media technologies in scholarly communication in Kenya.

In terms of policy, the study was significant in a number of ways. It will help to inform stakeholders like universities, publishers and other institutions of higher learning on the trends and preferences of using new media in scholarly communication. It is hoped that this information will be helpful to these institutions when planning and availing the new media tools for use in scholarly communication within their publishing press units and editorial teams. It is hoped that the study findings will help to enhance the capacity of existing university publishing press units in Kenyan universities to perform the three major roles of universities: to conserve knowledge; to advance knowledge; and to disseminate knowledge.

The results of the study should also help the Commission for University Education (CUE) and other policy makers to come up with policies that could enhance a comprehensive process that involves benchmarking for best practices in use of new media in scholarly communication. In addition, CUE should find the study useful in accreditation and quality assurance processes for new media infrastructure in both public and private universities. The study has provided new knowledge and insight that could help to assess various technologies used in scholarly communication and ensure a better research culture in Kenyan universities.

The study has helped to identify factors slowing down the use of new media technologies in scholarly communication in Kenya. It is hoped that mechanisms to help address them will be sought by stakeholders. The findings of the study provide a baseline report against which universities and the policy makers should come up with policies on collaborations and partnerships for better utilisation of the current ICT and new media infrastructure in scholarly communication. This could be in areas of resource sharing, exchange programmes and accessibility to new media applications and software for use by academic staff in research dissemination. Some of these mechanisms are discussed under the recommendations section. The researcher hopes that these interventions will encourage more researchers to disseminate their research works through new media hence help to address the challenges of accessibility and availability of research from Kenya.

Finally, Kenya's Vision 2030 proposes intensified application of science, technology and innovation to raise productivity and efficiency levels across the three pillars of the Vision; Economic, Social and Political. The Vision recognises the role of science, technology and innovation (STI) in a modern economy, in which new knowledge plays a central role in wealth creation, social welfare and international competitiveness. Kenya intends to become a knowledge-led economy wherein, the creation, adaptation and use of knowledge will be among the most critical factors for rapid economic growth (Government of Kenya, 2007). This study has made observations which should help to inform policy makers on

how new media technologies should be deployed to disseminate works of scholarship that are geared towards driving the Vision. The government of Kenya through the Ministry of Education, Science and Technology and the State Department of Higher Education should use the findings of this study to come up with a clear policy on new media use in scholarly communication. The policy shall guide the provision of uniform operations and practices of scholarly communication infrastructure across the country.

### **1.6 Scope of the Study**

This study aimed at establishing the determinants of use of new media in scholarly communication among university academic staff in Kenya. According to Logan (2010), new media are taken to be those methods and social practices of communication, representation, and expression that have developed using the digital, multimedia, networked computer and the ways that computers have transformed work in other media: from books to movies, from telephones to television. These new media technologies are identified by Gu and Widen-Wulff (2010) as Web 2.0 and social media. These technologies incorporate new media tools used for scholarly communication which include online documents, multimedia sharing, social networks, tagging, Wikis, RSS, Miniblogs and Blogs (Gu and Widen-Wulff, 2010). The Kenyan scholarly communication scene was evaluated against these technologies. The level of use of these new media technologies by researchers in their scholarly communication activity and the extent to which relevant infrastructure is invested has been discussed based on literature accessed and findings received from respondents.

The study was conducted among lecturers in five selected public universities which included University of Nairobi, Kenyatta University, Moi University, JKUAT and Egerton University. These five universities were selected owing to the fact that they are the leading Kenyan universities in terms of scholarly communication activity based on two reports by independent international bodies (INASP, 2012 and Webometrics, 2017). The population sample was drawn from lecturers from the Faculties/Schools of Arts and



Social Sciences or their equivalents in the five universities and it involved 130 respondent academic staff.

This was a quantitative survey study and it used a cross-sectional survey design. The study used both probability sampling techniques such as random sampling and non-probability sampling methods, specifically purposive sampling and quota sampling to sample participants. A structured questionnaire was used to collect data.

The study was guided by two theories: the unified theory of acceptance and use of technology (UTAUT) by Venkatesh, Morris, Davis, and Davis (2003) and the uses and gratifications theory (UGT) by Elihu Katz. UTAUT was relevant because it is a synthesis of eight user acceptance and motivation models that were initially separate. The eight theories are the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Motivational Model (MM), the Theory of Planned Behaviour (TPB), a combined theory of Planned Behaviour/Technology Acceptance Model (C-TPB-TAM), the Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT). UTAUT helped to unravel how factors like performance expectancy, effort expectancy, social influence and facilitating conditions of new media infrastructure have influenced the use of new media in scholarly communication in Kenya.

### **1.7 Limitations of the Study**

This study was only limited to five public universities in Kenya which had a strong practice of scholarly communication. These were the University of Nairobi, Kenyatta University, Egerton University, Jomo Kenyatta University of Agriculture and Technology, and Moi University. These five universities were selected owing to the fact that they are the leading Kenyan universities in terms of scholarly communication activity based on two reports by independent international bodies (INASP, 2012 and Webometrics, 2017). The population sample was drawn from lecturers from the Faculties/Schools of Arts and Social Sciences or their equivalents in the five universities

and it involved 130 respondent lecturers. Private universities were therefore not represented in this study because they did not feature prominently on the research productivity rankings by both INASP and Webometrics. The study acknowledges that some of these private universities may be better equipped than public universities in terms of new media facilities like internet bandwidth and adequate computers. However, they could not be included in the sample on the basis of their research output compared to the five public universities selected.

The study sought to establish the determinants of use of new media in scholarly communication by lecturers in the five public universities. However, since it was not possible to include all the lecturers in the five universities in the sample, the study used lecturers from the faculty of arts and social sciences or its equivalent school or college from all the five universities. This faculty/school was selected because the researcher ascertained that all the five universities had such a faculty or its equivalent. This ensured that lecturers teaching similar programmes were involved in the study. The faculty was also preferred because it was found to be very large in most of the five universities hence it assured the likelihood of gathering enough respondents.

The study took much longer than was expected because of challenges of unavailability of some respondents due to factors beyond the researcher. At the time the data was being collected in early 2017, there was a prolonged lecturer's strike in all the public universities in Kenya that spanned almost two months. The strike made it difficult for the researcher and the research assistants to get to the respondents in their offices. Data collection had to be suspended for a while leading to a delay of almost six months. In addition, several trips had to be made to the five universities and this led to a huge expenditure that had not been anticipated. To cater for this, the researcher had to revise the budget as well as the work plan until eventually all the projected respondents were reached.

The other limitation arose from the fact that the five universities are spread across the counties of Nairobi, Nakuru, Kiambu and Uasin Gishu. This vastness meant that there was a lot of travelling to be done and when some respondents from some of the universities could not be found, repeat trips had to be made. This was draining in terms of time and money. To help minimise these, the researcher engaged two research assistants; one from Nairobi region and another from the Rift Valley region. The two were very helpful when we needed to collect data from the two regions concurrently. They were also very helpful in follow-up of the respondents to ensure that the questionnaires distributed to them were filled and returned promptly.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This study aimed to establish the determinants of use of new media in scholarly communication among public university academic staff in Kenya. This chapter presents the literature review of the study. The chapter also presents the theoretical framework. Two theories guided this study: the unified theory of acceptance and use of technology (UTAUT) and the uses and gratifications theory (UGT). Both theories are also discussed in detail. The chapter also presents the conceptual framework of the study which indicates the relationship between independent and dependent variables. Finally, the chapter has presented a critique of the literature accessed as well as the gaps identified in this literature. It is important to note from the onset that though a lot has been written about scholarly publishing in Kenya, there is not enough literature on how new media has shaped Kenya's scholarly communication.

#### **2.2 Theoretical Review**

This study conceptualized the role of new media on scholarly communication using the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Uses and Gratification Theory (UGT). The theories are discussed forthwith.

##### ***2.2.1 Unified Theory of Acceptance and Use of Technology***

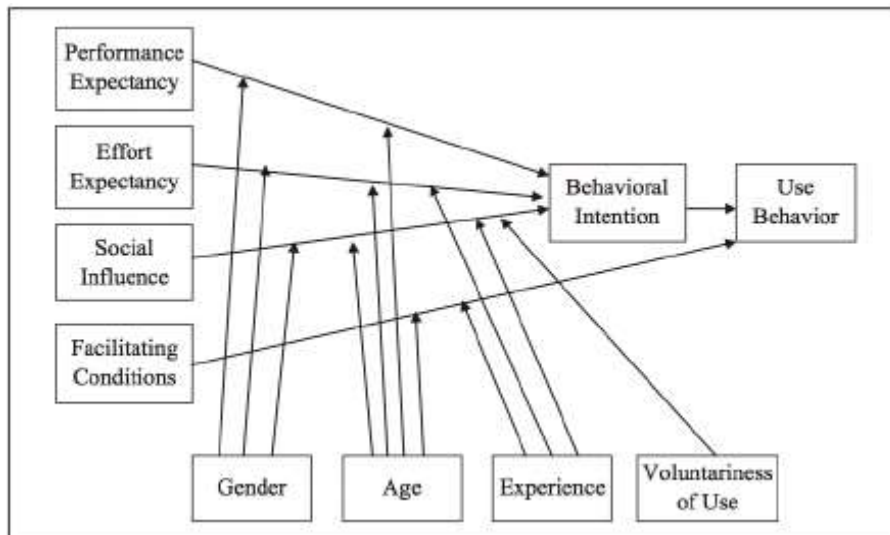
The Unified Theory of Acceptance and Use of Technology (UTAUT) model was developed by Venkatesh, Morris, Davis, and Davis in 2003. Initially there were several models which attempted to explain how technology comes to be accepted by users. In the process, different characteristics put forward by different theorists were relied on causing a lot of confusion. In response to this confusion, and in order to harmonise the literature associated with acceptance of new technology, Venkatesh et al. (2003) developed a unified model that brings together alternative views on user and innovation acceptance – UTAUT.

These scholars have attempted to synthesize eight user acceptance and motivation models to propose UTAUT. The eight theories which have been unified are the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Motivational Model (MM), the Theory of Planned Behaviour (TPB), a combined theory of Planned Behaviour/Technology Acceptance Model (C-TPB-TAM), the Model of Personal Computer Utilisation (MPCU), Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT) (Akbar, 2013).

According to UTAUT, six constructs are significant determinants of intention or usage of a new technology (system). Of these six, Venkatesh et al (2003), theorized that four core constructs are direct determinants of technology acceptance (behavioral intention) and use (behavior): Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. The other two constructs (Attitude towards using technology and anxiety) were theorized as not being direct determinants of intention or usage. The theory also suggests that the effect of these constructs is moderated by four other variables: age, gender, experience and voluntariness of use. This is illustrated in Figure 1. This theory was selected for this study because it provided a framework for understanding how new media has transformed scholarly communication by illustrating how factors like Performance Expectancy (PE), Effort Expectancy (EE), Social Influence, Facilitating Conditions, attitude and anxiety have influenced the use of new media in scholarly communication in Kenya.

#### 2.2.1.1 The Key Tenets of UTAUT Model

Based on Venkatesh *et al.* (2003), the following discussion provides a brief review of the core tenets of the UTAUT model, which have been theorised to be the determinants of acceptance and use of technology in regard to use intentions and/or behaviour.



**Figure 1.1: UTAUT Model**

Source: Venkatesh, et al 2003.

To first understand the major theoretical underpinnings of the UTAUT model, this study briefly discussed each of the eight foundational theories. The first of the eight theories of the UTAUT theory is the theory of reasoned action (TRA). TRA is one of the most fundamental and influential theories about human behaviour. It argues that attitudes towards behaviour and subjective norms are the two core constructs that determine human behaviour and actions.

The second theory is the technology acceptance model (TAM) which was developed to predict technology acceptance and use in the workplace. It has been applied extensively to various types of technologies and users. TAM posits that perceived usefulness and perceived ease of use are the two main determinants of acceptance of new technology. More recently, Venkatesh and Davis (1996) presented TAM 2 by adding subjective norms to the original TAM for mandatory settings.

The third theory is the motivation theory which was employed by Davis *et al.* (1992) to understand how new technology is accepted and adopted by focusing on extrinsic as well

as intrinsic motivations. The fourth theory is the theory of planned behaviour (TPB) which extended the TRA by including the construct of perceived behavioural control and has been successfully used to provide a better understanding of individuals' acceptance and use of various technologies.

The fifth theory is the Combined Theory of Planned Behaviour/Technology Acceptance Model (C-TPB-TAM) which is a hybrid model combining the predictors of the TPB with the TAM's perceived usefulness. The sixth theory by Thompson et al. (1991) is the Model of Personal Computer Utilisation (MPCU), which was based on the theory of human behaviour to predict personal computer (PC) use. The MPCU consists of six constructs: the job fit, complexity, long-term consequences, use influence, social factors, and facilitating conditions.

The seventh theory, the Innovation Diffusion Theory (IDT) by Moore and Benbasat (1991) adapted the properties of innovation in the innovation diffusion theory and refined a set of constructs for exploring individual technology acceptance. These constructs include relative advantage, ease of use, the image, visibility, compatibility, the demonstrability of results, and the voluntariness of use.

Finally, Compeau and Higgins (1995) applied and extended the social cognitive theory to the context of computer use. They developed the Social Cognitive Theory (SCT) which consists of five core constructs: expected performance, outcome expectations, self-efficacy, impact, and anxiety.

A brief discussion of the six components of the UTAUT model is presented hereunder:

1. Performance Expectancy

*Performance expectancy* is defined as 'the degree to which an individual believes that using a new technology will help him or her to attain gains in job performance' (Venkatesh et al. 2003). The key constructs of performance expectancy are (1) perceived

usefulness (PU), (2) extrinsic motivation, (3) the job fit, (4) relative advantage, and (5) outcome expectations.

PU is derived from TAM and is defined as ‘the degree to which a person believes that using a particular system would enhance his or her job performance’ (Venkatesh *et al.* 2003). Extrinsic motivation is derived from the motivational model and is defined as ‘the perception that users will want to perform an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as modified job performance, pay, or promotions. The job fit is derived from the MPCU and is defined as ‘how the capabilities of a system enhance an individual's job performance’. Relative advantage is derived from the innovation diffusion theory and is defined as ‘the degree to which an innovation is perceived as being better than its precursor’. Outcome expectations are derived from the social cognitive theory and are differentiated into performance and personal outcomes. Performance outcomes deal specifically with job-related outcomes, whereas personal outcomes address individual esteem and the sense of accomplishment. The UTAUT model proposes that gender and age moderate the relationship between performance expectancy and behavioural intentions.

## 2. Effort Expectancy

*Effort expectancy* is defined as the ‘degree of ease associated with the use of a new technology (Venkatesh *et al.* 2003). Its principal pillars are (1) perceived ease of use, (2) complexity, and (3) ease of use. Perceived ease of use (PEOU), derived from TAM, is described as ‘the degree to which a person believes that using a particular system would be free of effort. Complexity is derived from the MPCU and is defined as ‘the degree to which an innovation is perceived as relatively difficult to understand and use’. Ease of use is derived from the innovation diffusion theory and is defined as ‘the degree to which an innovation is perceived as being difficult to use’. The UTAUT model suggests that gender,



age, and experience moderate the relationship between effort expectancy and behavioural intentions.

### 3. Social Influence

*Social influence* is defined as ‘the degree to which an individual perceives that important others believe he or she should use the new system’ (Venkatesh *et al.* (2003). Its root constructs include (1) subjective norms, (2) social factors, and (3) the image. Subjective norms are included in almost all of the theories upon which the UTAUT model is built and is defined as ‘the person's perception that most people who are important to him think he should or should not perform the behaviour in question. Social factors are drawn from the MPCU and defined as ‘the individual's internalisation of the reference group's subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situations. The image comes from the innovation diffusion theory and is defined as ‘the degree to which use of an innovation is perceived to enhance one's image or status in one's social setting (Venkatesh *et al.* 2003). The UTAUT model suggests that gender, age, experience, and voluntariness moderate the relationship between social influence and behavioural intentions.

### 4. Facilitating Conditions

Facilitating conditions are the variables theorised to have a direct effect on system usage and are defined as ‘the degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system’ (Venkatesh *et al.* 2003). The key constructs are (1) perceived behavioural control, (2) facilitating conditions, and (3) compatibility. Perceived behavioural control ‘reflects perceptions of internal and external constraints on behaviour and encompasses self-efficacy, resource facilitating conditions, and technology facilitating conditions. Facilitating conditions are derived from the MPCU and are ‘objective factors in the environment that observers agree make an act easy to do, including the provision of computer support. Compatibility is derived from the innovation diffusion theory and is defined as ‘the degree to which an innovation is perceived as being

consistent with existing values, needs, and experiences of potential adopters' (Venkatesh *et al.* 2003). The UTAUT model suggests that age and experience moderate the relationship between facilitating conditions and behavioural intentions.

#### 5. Use/Acceptance Behaviour

*Use behaviour* can also be traced to the TRA. In developing the TAM, Davis *et al.* (1989) suggested that the TRA was appropriate for examining the determinants of computer use behaviour as a special case. Like behavioural intentions, use behaviour was not explicitly defined in the development of the UTAUT model, although it was measured via system logs. Ideally, use behaviour refers to the decision to begin using a certain technology and the characteristics associated with such usage.

#### 6. Anxiety and Attitude

Venkatesh et al (2003), theorised attitude towards using technology (ATUT), and anxiety as not being direct determinants of intention or usage of a technology. They defined anxiety as an individual's overall affective reaction to using a technology. Attitude toward a behaviour is defined as an individual's positive or negative evaluation of performing the behaviour. It involves an individual's judgment that performing a behaviour is good or bad and also a general evaluation that an individual is inclined or disinclined to perform the behaviour (Ajzen and Fishbein, 1980). The UTAUT model found that four constructs from existing models aligned closely with this definition: attitude towards behaviour (TRA, TBB/DTPB, C-TAM-TPB), intrinsic motivation (mm), affect towards use (MPCU), and affect (SCT). However, UTAUT did not include anxiety and attitude as direct determinants of technology use.

### ***2.2.2 Uses and Gratifications Theory***

This theory emerged out of the studies which shifted their focus from what media do to the people to what people do with media (Katz,1959). The uses approach assumes that audiences are active and willingly expose themselves to media. The uses of the mass

media are dependent on the perception, selectivity, and previously held values, beliefs and interests of the people.

The theory perceives the consumer of media fare as actively influencing the consumption or reception, since he/she selectively chooses, pays attention to, interprets, and retains the media messages based on his/her needs, beliefs or even his/her needs, desires and interests. The focus was thus shifted from media production and transmission functions to media reception and consumption functions (Wood, 2009). Instead of asking “What kinds of effects occur under what conditions?”, the question became, “Who uses which contents from which media, for which reasons and under which conditions?”

According to Griffin (2012), the study of how media affect people must take account of the fact that people deliberately use media for particular purposes. In the history of media theory, UGT is known for its deliberate shift away from the notion that powerful media messages have uniform effects on large passive audiences. Instead the theory emphasizes the personal media choices consumers make to fulfill different purposes at different times. The theory assumes that people have needs that they seek to gratify through media use. The deliberate choices people make in using media are presumably based on the gratifications they seek from those media.

One of the most comprehensive typologies of media uses and gratifications was proposed by communication scholar Alan Rubin in 1981. Rubin claims that his typology of eight motivations can account for most explanations people give for why they watch television. According to Rubin (1981), people use media in the following ways: passing time, companionship, escape, enjoyment, social interaction, relaxation, information and excitement.

UGT researchers today are exploring predictive and explanatory possibilities of the theory by connecting media usage with individual factors. There is particular interest in the link

between why media is used and the gratifications received. Overall, UGT has been crucial to a shift that focuses on the media user and their agency in the field of mass media studies.

Today, UGT has more relevance than ever as a tool for understanding how we as individuals connect with the technologies around us. These technologies span everything from the Internet, video gaming, new media and mobile phones. UGT research into mobile phone usage has found that people seek a number of gratifications from their phones, including affection/sociability, entertainment, and mobility, among others (Whiting & Williams, 2013). As another example of a contemporary technology, when using social media, users can be motivated by factors like a need to vent negative feelings, recognition, and cognitive needs.

This study sought to establish the determinants of use of new media in scholarly communication among lecturers in public universities in Kenya. To achieve, it was important to establish whether the lecturers used new media in their scholarly communication activities. UGT helped to establish the various uses to which lecturers put new media in performing their scholarly communication. It also helped to identify the gratifications sought by academic staff in public universities in Kenya who use new media in their scholarly communication activities. These were addressed in the first section of the questionnaire where lecturers were asked to indicate the new media platforms they used in scholarly communication and the formats they used. Even though uses and gratifications theory has a specific relevance to social media, it has not been given prominence in scholarly communication literature. This study sought to apply UGT to help explain why and how lecturers use new media in their scholarly communication activities.

New media allows ease of accessibility to other publications across the world which can inform Kenyan researchers in conducting research and writing their scholarly works. Many scholars can gain access to studies elsewhere and replicate them in Kenya with

much ease and without having to re-invent the wheel. This is made possible by new media technologies which enable faster access to foreign and local publications through using internet search engines (Rao, 2001). Access to Kenyan publications distributed through new media will also be opened globally hence positioning Kenyan scholarship to wider audiences. New media makes it easy to publish scholarly work by providing an easier avenue that can navigate the traditional barriers to publishing. New media also opens new unlimited avenues for scholarly communication which would have otherwise been limited by traditional print media.

From the onset, UGT has been criticised for being more audience centred in terms of audience consumption of media messages rather than looking at audiences as originators of messages as well (Wood, 2009). This is especially crucial in the modern environment of communication across new media channels. Nevertheless, this theory was helpful in this study as it helped to understand the various uses to which lecturers put new media and the gratifications they seek from such new media use in their scholarly communication activities.

### **2.3 Conceptual Framework**

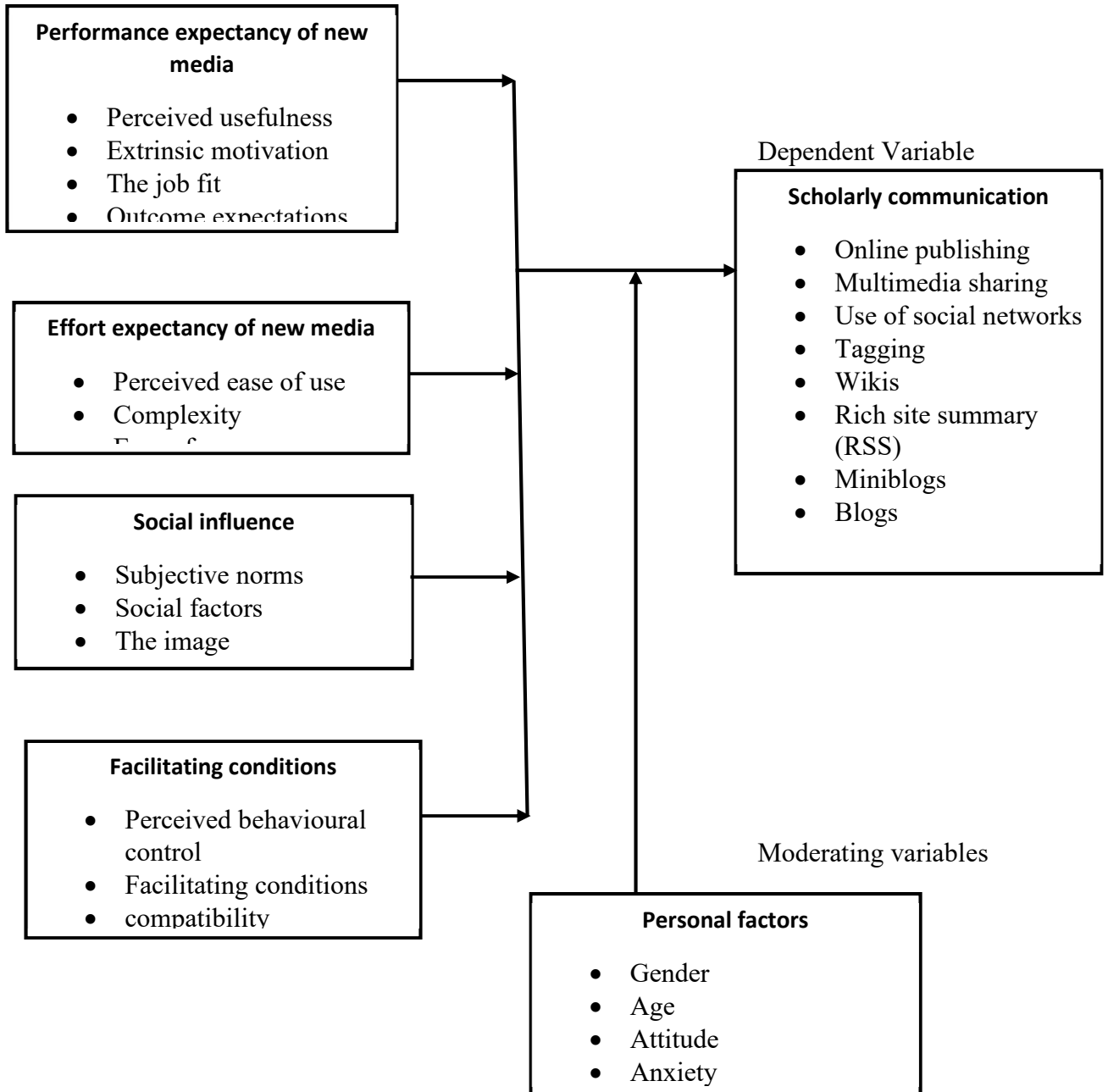
The determinants of use of new media in scholarly communication is the independent variable which influences how scholarly communication (dependent variable) is conducted. Based on the UTAUT theory, four factors influence the acceptance of a new technology. These are performance expectancy, effort expectancy, social influence and facilitating conditions. These are moderated by personal factors of age, gender, attitude and anxiety. These factors formed the independent variables of this study and were covered in the objectives of the study.

The dependent variable for this study was use of new media in scholarly communication. According to Graham, (2000), the scholarly communication process could be divided into three main stages: the communication in informal networks like social media, the semi-

formal dissemination in conferences and preprints, and formal publication of research in scientific journals. There are three important new media forms which affect scholarly communication. These are (1) open access archives, (2) open access publishing and (3) Web 2.0 tools (Sawant, 2012). Web 2.0 tools identified for use in scholarly publishing include: Online documents, multimedia sharing, social networks, tagging, Wikis, RSS, miniblogs, and blogs (Gu and Widen-Wulff, 2010).

Independent Variables

**Determinants of Use of New Media**



**Figure 1.1: Relationship between variables in this study**

## **2.4 Review of variables**

Based on the conceptual framework identified, this study sought to identify and explain the relationships of the independent and dependent variables discussed forthwith. The independent variable was the determinants of use of new media while the dependent variable was the use of new media in scholarly communication.

### **2.4.1 Performance Expectancy of New Media**

Performance expectancy refers to the degree to which an individual believes that using the system will help him or her to attain gains in job performance (Venkatesh, et al 2003). Ideally, this means that people are more likely to adopt a new technology if they believe that it will help them to perform better in their job. Venkatesh et al. (2003) integrated five concepts from different models to come up with the concept of performance expectancy. These include perceived usefulness, job-fit, extrinsic motivation, relative advantage and outcome expectations.

Davis (1986) introduced the concept of perceived usefulness (PE) in the Technology Acceptance Model. He defined PE as an individual's perception about the likelihood that the use of a new technology will enhance his or her performance on the job (Davis, 1986). This is similar to the definition of performance expectancy. When the encouragement to perform an activity is achieving external outcomes, the motivation to do this is called extrinsic motivation. Examples of extrinsic motivation are rewards and punishments such as salary raise, grades or promotions (Davis et al., 1992).

Job-fit as a third concept can again be explained by the belief of an individual that accepting the technique or technology will lead to gains in job performance. The extent to which an individual perceives a new technology as being more useful than the previous one, simply explains the concept of relative advantage (Rogers, 1995). Bandura (1986) introduced outcome expectations in his Social Cognitive Theory. This concept is divided into performance-related (or job-related) and personal-related outcome expectations (e.g.



sense of accomplishment and self-esteem). The similarities between these concepts are acknowledged by several researchers (Davis, Bagozzi, & Warshaw, 1989; Plouffe, Hulland, & Vandenbosch, 2001).

Scholarly communication has been transformed by the revolution in information and communication technologies (ICTs), especially the Internet. With the emergence of the Internet, publishing has become easier, quick and cheap in a medium that can be accessed easily by everyone from everywhere (Rao, 2001). Electronic communication has changed the way scholars and researchers communicate findings (Sawant, 2012). On one hand, the Internet enables unprecedented dissemination possibilities, providing access to refereed publications and other scholarly documents to anyone in any global location with a network connection. It has affected scholarly publishing by enabling new publishing models. Such new models are termed to be new because they offer a new genre (or form of presentation), a new mode for interaction, a new business model, a new approach to peer review, or some combination of these (Hahn, 2008). This study sought to establish whether academic staff in public universities in Kenya find new media more useful the performance of their scholarly communication tasks.

#### **2.4.2 Effort Expectancy of New Media**

Effort expectancy is defined as the degree of ease associated with the use of the system or the degree to which a person believes that using a particular system would be free from effort (Davis, 1998; Venkatesh et al, 2003). Just like performance expectancy, Venkatesh et al. (2003) captured three constructs from other models into this concept, that is perceived ease of use, complexity and ease of use. The first one, perceived ease of use, is a concept from the Technology Acceptance Model (Davis, 1986) which refers to the idea that using the new technology will be effortless. The second concept integrated in effort expectancy, is complexity (Thompson et al., 1991). Complexity in this model should be understood as the difficulty to use a system as perceived by the users. Ease of use as a last concept, is a core construct of the diffusion of innovation theory (Rogers, 1995) and its

definition is equal to the one of complexity. The definition of complexity concerns a general system whereas ease of use is about an innovation (Venkatesh et al., 2003).

Among others, Plouffe et al. (2001) and Thompson et al. (1991) confirmed the similarities between these concepts. The hypothesis that effort expectancy positively affects the behavioural intention to use, as well as the actual use of a technology, has regularly been formulated in previous studies (Arman & Hartati, 2015; Chang, Hwang, Hung, & Li, 2007; Phichitchaisopa & Naenna, 2013). Most researchers found support for this relationship (Chang et al. 2007; Phichitchaisopa & Naenna, 2013), but others concluded that effort expectancy had no significant influence (Arman & Hartati, 2015; Bennani, Oumlil and Grenier, 2014).

A study done by Dogoriti, Pange and Anderson, (2014) on the use of web-enhanced teaching of English as a foreign language in higher education in Greece found that use of web-based tools and social media changed the way students viewed the use of internet technology in the development of their English language learning. This study sought to establish whether users of new media in scholarly communication anticipated the experience to be effortless compared to traditional ways of scholarly communication. As noted earlier, UTAUT adopted the key constructs of (1) perceived ease of use, (2) complexity, and (3) ease of use as had been suggested by Davis (1998) in TAM model. These constructs were investigated by this study to help analyse how they influenced use of new media technologies by university lecturers in their scholarly communication tasks.

#### **2.4.3 Social Influence of New Media**

Social influence is defined as ‘the degree to which an individual perceives that important others believe he or she should use the new system’ (Venkatesh *et al.* 2003). As already discussed, its key constructs include (1) subjective norms, (2) social factors, and (3) image. Each of these concepts refer to the notion that the social environment has a substantial influence on whether people accept to use a new technology or not (Venkatesh

et al., 2003). Subjective norm was introduced in the TRA by Ajzen and Fishbein (1977), then used by Ajzen (1985) in his TPB and by Taylor and Todd (1995) in their C-TAM-TPB.

Venkatesh and Davis (2000) extended the Technology Acceptance Model by including subjective norm as an extra concept for the prediction of behavioural intention. Their new model was called TAM2. Subjective norms are included in almost all of the theories upon which the UTAUT model is built and is defined as ‘the person's perception that most people who are important to them think they should or should not perform the behaviour in question’. The concept can be explained by one’s perception about how important others think he or she should act.

Social factors as a second concept integrated in social influence refers to the internalisation of the culture and social agreements the individual shares with others (Venkatesh et al., 2003). Social factors are a core construct of the Model of PC Utilization by Thompson et al. (1991). The third concept, image, is introduced in the IDT by Rogers (1995) and can be understood as the perception that the use of a new technology will upgrade a person’s image or social status. Based on the UTAUT, researchers often want to investigate the hypothesis that social influence has a positive effect on the behavioural intention to use, and the actual use of a technology (Arman & Hartati, 2015; Chang et al., 2007; Phichitchaisopa & Naenna, 2013). Although some researchers found social influence was the most salient predictor (Alaiad & Zhou, 2014), others found that the effect was only marginally significant (Chang et al., 2007). Indeed, some studies even had to reject the hypothesis, because the effect of social influence did not achieve significance (Bennani, Oumlil, & Grenier 2014; Phichitchaisopa & Naenna, 2013).

Respondents in this study, were asked whether most of the people who are important to them expected them to use new media technologies in scholarly communication. In addition, respondents were asked whether their universities expected that they use new

media in their scholarly communication tasks. The image comes from the innovation diffusion theory and is defined as ‘the degree to which use of an innovation is perceived to enhance one's image or status in one's social setting (Venkatesh *et al.* 2003). The UTAUT model suggests that gender, age, experience, and voluntariness of use moderate the relationship between social influence and behavioural intentions.

#### **2.4.4 Facilitating Conditions of use of New Media**

Facilitating conditions refers to the degree to which an individual believes that an organisational and technical infrastructure exists to support use of new technology’ (Venkatesh *et al.* 2003). The key constructs are (1) perceived behavioural control, (2) facilitating conditions, and (3) compatibility. Perceived behavioural control ‘reflects perceptions of internal and external constraints on behaviour and encompasses self-efficacy, resource facilitating conditions, and technology facilitating conditions.

Studies in information science and social psychology have conceptualised and operationalised facilitating conditions using two or more constructs to cater for both internal and external facets. Internal facets of facilitating conditions operate through the effort expectancy construct, which has a direct influence on behavioural intention (Venkatesh 2000; Venkatesh *et al.* 2003). Given that the conceptualisation and operationalisation of facilitating conditions in UTAUT emphasizes external facets (e.g., resources), consistent with Venkatesh *et al.* (2003), there is therefore no direct relationship between facilitating conditions and behavioural intention. The relationship between facilitating conditions and use of a new technology is fully mediated by behavioural expectation. Recognition of the presence of favourable facilitating conditions (or lack thereof) alone is not expected to directly influence use of a new technology. Rather, acceptance of a new technology is premised on the consideration of whether, and to what extent, an individual perceives that facilitating conditions will enable use of a new technology in light of other potential behavioural impediments.

Behavioural expectation is a function of the evaluation of facilitating conditions, captured by the external impediments aspect of facilitating conditions. Thus, facilitating conditions can have an influence on behavioural expectation without affecting behavioural intention. For example, no matter how competent an employee is in using a system, if the organisation does not have adequate resources (e.g., technology infrastructure) to support adoption of a new system, the individual's behavioural expectation to use that system will be lowered. Although the individual may still have a behavioural intention to use the technology, he or she may not have a high behavioural expectation to do so given the lack of necessary resources. Moreover, when employees resist the implementation of a new technology, they might be offered new resources (e.g., upgrading their software). Such an action is likely to have a positive impact on their behavioural expectation regarding use of the new technology but may not increase their behavioural intention to use the technology.

The questionnaire for this study sought to find out from respondents whether they believed that their universities had provided sufficient facilitating conditions for using new media in scholarly communication. Such facilitating conditions as proposed by (Venkatesh et al 2003), include adequate computers, power connectivity, human resources including adequate support and technical staff, internet connectivity, among others. These elements were constructed in the questionnaire. According to Dupagne and Driscoll (2005), facilitating conditions also include the evaluation of financial resources available for purchase, judged more from one's perception of the product's intrinsic value than from its actual monetary cost. The emphasis of this construct is on the self-perceived financial wherewithal of the potential adopter when s/he considers adopting an innovation (e.g., "Can I afford this item?"). Perceived facilitating conditions were hypothesized to be positively related to rate of adoption or innovativeness with new media in scholarly communication.

In addition to the ICT infrastructural establishments, ICT technical support staff are required to monitor and maintain computer systems and software if scholarly communication is to be successfully delivered on new media platforms. These ICT technical staff help to install and configure computer systems, diagnose hardware and software faults and solve technical and application problems. According to Guma, Faraque and Khushi (2013) the breakdown of computer systems can cause delays and interruptions, and without adequate assistance, repairs of the computer cannot be consistently undertaken. This results in lecturers not being able to use new media in their scholarly communication activities and teaching. According to Kiptalam (2010), one of the top challenges to using ICTs in education was lack of ICT technical support. Other challenges include; low internet connectivity, virus attack, cyber-attack and malfunctioning of the printers. Such ICT technical barriers discourage lecturers from effectively engaging with new media in their scholarly communication and teaching functions.

Guma, et al. (2013) carried out a study to find out factors influencing the use of ICT in making teaching and learning process effective in institutions of higher learning in Uganda. They concluded that several factors positively influence teachers and administrators to use ICT in education. These factors were; teachers attitudes, competence in use of ICT, computer self-efficacy, teaching experience, education level, and professional development. Other factors which the research revealed to have an influence on ICT usage were; accessibility, technical support, leadership support, pressure to use technology, government policy on ICT literacy and technological characteristics.

It is, therefore, crucial to provide university lecturers with technical support with regard to repair and maintenance for the continued use of new media in scholarly communication. Without the technical support, lecturers get discouraged to use new media technologies in scholarly communication. This study established the perceptions of lecturers on the

adequacy of facilitating conditions available in universities to support their use of new media in scholarly communication.

Kenya still lags behind in the provision of electronic telecommunication technology although there have been great strides in the last decade. Nyerere (2012) points out that Kenyan universities had limited access to modern computing and communication technologies, making it difficult for lecturers and students to be acquainted with current development in their academic areas and also to have access to relevant computer software and hardware. In 2005 ICT in Education Options Paper and ICT policy of 2006, Kenya recognised the many ways in which ICTs can support and improve the delivery of quality education at all levels and the role of ICT in the social and economic development of the nation. These options are enshrined in Sessional Paper No. 1 of 2005 and Kenya Education Support Project (KESSP, 2006) which include quality teaching and learning through ICTs (Republic of Kenya, 2006).

The Ministry of Information and Communication (2006) asserts that countries that have embraced ICTs have attained considerable social and economic development. This is because ICTs are rapidly transforming the countries into information and knowledge-based economies. In the year 2006, the Government of Kenya, therefore, established a national ICT policy based on the Economic Recovery Strategy for Wealth and Employment Creation (2003-2007). This was initiated because, teaching and learning are no longer solely dependent on printed instructional material.

However, great strides are being made in technological developments with innovations in ICT moving faster than they are applied. For instance, in the Proceedings and Report of the 7<sup>th</sup> UbuntuNet Alliance Conference (2014), Muia, Osure and Meoli reported that KENET had connected about 152 university campuses in 32 counties in Kenya as at 2014 with an enrolment of over 500,000 students and faculty. Economic Survey Report (2015) asserts that ICT is increasingly becoming an important enabler of economic growth and

over the years. Deployment of Fibre Optic cable has also seen a remarkable explosion in internet and broadband market (Kiura, 2012).

The Ministry of Education in Kenya, in its endeavour to pursue quality education, recognises that ICT is an important tool for education and a crucial medium for curriculum delivery (MoE, 2006). Nyerere, (2012) noted that ICT could be used to improve the effectiveness of teaching and learning individually or to small groups of learners. Nyerere et al. (2012) further affirms that ICTs play an important role in distance education, internet libraries and databases. From the aforementioned discussion, the status of access to ICT in Kenya is improving and people recognise the importance of ICTs in higher education, research and scholarly communication.

#### **2.4.5 Personal Factors and Use of New Media**

This study sought to evaluate the moderating effect of personal factors on the use of new media in scholarly communication by university academic staff. The personal factors identified in this study based on the UTAUT model include attitude, anxiety, gender, age, scholarly rank and educational qualifications. UTAUT suggests that the effect of the four key constructs identified in objectives 1-4 is moderated by four other variables: age, gender, experience and voluntariness of use. The UTAUT model also suggests that gender, age, experience, and voluntariness of use moderate the relationship between social influence and behavioural intentions.

Personal factors are critical because the effect of the determinants may be more pronounced among women than men or among younger users than older users. For instance, facilitating conditions are expected to be more important for women than they are for men. Venkatesh et al. (2000) argued that women are more process-oriented. Facilitating conditions, such as availability of external help, support, training, etc., will help women to learn about the process of using the system. Hence, they will place more importance on facilitating conditions in shaping their behavioural expectation regarding



use of a new technology. Access to resources and assistance are also important facilitating conditions for older users because of the difficulty they experience in performing various work-related tasks (Morris and Venkatesh 2000). Older individuals place a greater emphasis on the external aspects of perceived behavioural control, a construct similar to facilitating conditions. We also expect that the effect of facilitating conditions on behavioural expectation will be stronger because with increasing experience, individuals become more familiar with the external resources and discover various ways to find support to facilitate their use of the technology, thus placing more importance on external factors. The moderating effects of gender, age, and experience are therefore expected to work in tandem as a four-way interaction.

The study sought to determine how attitude towards using new media technologies influences their use in scholarly communication by academic staff in Kenya's public universities. The UTAUT model theorized that four constructs from the existing models aligned closely with the definition of attitude: These were attitude toward behaviour (TRA, TBB/DTPB, C-TAM-TPB), intrinsic motivation (MM), affect towards us (MPCU) and affect (SCT) (Venkatesh, et al 2003). These constructs were collapsed in to the four constructs which this study utilised.

The study also sought to determine the extent to which feelings of anxiety by university academic staff towards using new media technologies influences their decision about using these technologies in scholarly communication. Anxiety was assessed from a series of four statements seeking respondent's agreement or disagreement with its various dimensions.

## **2.5 Scholarly Communication**

Scholarly communication is an important aspect of the process of scholarship. Often, scholarly communication is also referred to as scholarly publishing or academic publishing. The term scholarly communication describes the process of sharing and

publishing research works and outcomes (Gu and Widen-Wulff, 2011). It is the system through which research and other scholarly writings are created, evaluated for quality, disseminated to the scholarly community, and preserved for future use (Sawant, 2012). Scholarly communication makes it possible for research to be available to a wider academic community and beyond. Hence, it can be simply referred to as the process of publication of peer reviewed or refereed publications. It involves the development of scientific information, interaction between various fields of research and disciplines, evaluation of communication between subjects or areas of specialism, dissemination of the required information and its application for individual user groups, and the ways in which formal and informal features of communication are connected (Mahmood, et al, 2011). According to Graham, (2000), the scholarly communication process could be divided into three main stages: the communication in informal networks like social media, the semi-formal dissemination in conferences and preprints, and formal publication of research in scientific journals.

Formal scholarly communication is impersonal and available over long periods of time and to an extended audience. It is associated with scholarly publishing and the creation of documents such as books, reports, theses and journal articles (Rao, 2001). This assertion agrees with Ngoben, (2010) who explains that formal scholarly communication takes any of the following formats: journal articles; monographs; conference proceedings and books (research-based as opposed to textbooks for teaching purposes). It is an important means of incorporating research findings into the corpus of knowledge and plays important legitimisation, dissemination and access functions. Semi-formal communication takes place through professional conferences, meetings or lectures. Informal communication is personal and social and often brief and momentary. It describes the communication activities between scholars and scientists in which they interact directly with one another through, for example, face-to-face discussion, telephone, e-mail, blogs, fax, post, correspondence, personal websites and conferences (Mahmood, et al, 2011). Björk (2007) and Houghton, et al. (2009), have identified the following five functions of scholarly

communication in modern scholarship: Fund research and research communication; perform research and communicate the results; publish scientific and scholarly works; facilitate dissemination, retrieval and preservation; and study publications and apply the knowledge.

The product of the scholarly communication process is scholarly literature. Scholarly literature is what communicates new academic findings by researchers to their peers, mainly primary literature or volumes that contribute to the store of knowledge in a culture or to the advancement of such knowledge (Bgoya, 2007). Scholarly publications therefore include publications of research findings, pioneering works in different academic disciplines, and bibliographical and data compilations. According to Bgoya, (2007) and Horowitz & Curtis (1995), to qualify as scholarly, a publication must have three qualities simultaneously: it was written by a scholar (primarily for other scholars), that it was peer reviewed by an acknowledged authority in the area covered, and that it covers a recognisable area within a continuing scholarly debate or inquiry about a subject. This therefore implies that content for any scholarly communication should form the basis of further research in the field or provoke scholarly debate in the area. This study therefore argued that as a process, scholarly communication begins with reading and ends with reading (see Figure 3). This is vital because to write scholarly works, researchers first need to read widely and collect primary and secondary data towards the actual writing. However, a scholarly work cannot claim to have any academic value unless it is read by other scholars to provoke intellectual debate.



**Figure 2.2: Process of Scholarly Communication**

### **2.5.1 Evolution of scholarly communication**

Formal scholarly communication can be traced back to the seventeenth century, to the correspondence between scholars in England (Correia and Teixeira, 2005). During this time, scholars would meet in groups to present papers and discuss research results under the auspices of the Royal Society. There were also correspondences in private letters and publishing of short accounts of work in progress to update members who were unable to attend the meetings. With the growth in volumes of correspondences, various scholarly journals emerged as a more efficient means of exchanging information. Among the first titles to be published were the *Journal des Scavans* and the *Philosophical Transactions of the Royal Society* (Correia and Teixeira, 2005).

From then throughout the eighteenth and nineteenth centuries, the nature of journals changed and became more fragmented into more specialised disciplines. They also picked up two main roles of advancing intellectual progress in their subject and establishing rights over any intellectual advances they brought about (Brown, 2004). Today, scholarly communication has transformed itself with the advent of new media. Electronic communication has changed the way scholars and researchers communicate findings (Sawant, 2012; Rao, 2001). Vrana (2011) contends that the traditional scientific journal is undergoing a transformation, initiated by technological opportunities and by a series of environmental factors that will shape the future structure and functionality of publications and communication. This on-going revolution is generating huge quantities of digital data hence creating opportunities for new forms of research and scholarship, different from the traditional ways of print-based scholarly communication.

### **2.5.2 The State of Scholarly Communication in Africa**

Africa lags behind the rest of the world in the field of scientific research hence an underdeveloped scholarly communication and publishing sector accounting for only 1.4% of the world's scholarly publications in the year 2010 (Quarshie & Oiseifuah, 2010). Bibliographic studies by Ochola and Ochola (2007), and others show that African scholars

are behind the rest of the world in scholarly productivity. African scholarly communication has been on the decline from mid-1980's and continues to decline (Quarshie & Oiseifuah, 2010; Mlambo, 2007). As a result, a lot of African scholarship either remains unpublished or is published away from Africa. Indeed, many established and upcoming African academics often dream of being published by the so called "prestigious journals" of the West. This not only denies the African people access to research that speaks to their experiences and aspirations, but also discourages many upcoming researchers who eventually give up, having failed to secure publishing space in some of the most sought-after international journals (Chakava, 2012).

Some of the challenges facing scholarly communication in many African countries are historical. Soon after independence, university education in Africa expanded rapidly in terms of student numbers as opposed to physical expansion and faculty to match the growing numbers. The government invested heavily in education and respected universities as important vehicles for promoting national development. The ruling elites worked very closely with academics, whom they highly respected. Academics also taught reasonably small classes which allowed them to research (Mlambo, 2007). However, in the mid-1970s, this "honeymoon" crumbled as a result of several factors ranging from economic decline to structural adjustment programmes (SAPs) introduced by donors leading to budget cuts hence reduced government funding to universities.

Growing university enrolment began putting pressure on university infrastructure and resources. The sizes of some classrooms began to grow to huge numbers meaning that the lecturers took heavier teaching loads, leaving very little time for research. Reduced government funding led to shrinking pay for faculty, forcing a number of them to relocate to 'greener pastures' abroad. This brain-drain greatly hindered knowledge production and research activities in African universities. Those who remained had to find ways to make extra money to cope. From being dedicated professionals contributing to knowledge and promoting the interests of their universities, focus shifted to donor-funded consultancy

research (Mlambo, 2007). To date, African scholarly communication continues to suffer from low or lack of government funding (Ngobeni, 2010).

African governments also cut funding for student's accommodation and food often leading to strikes and closures of universities sometimes for long periods. This underfunding of universities had a toll on their libraries as well, leading to book famine which meant that scholars could not easily access up-to-date journals and books – hence they could not produce quality research papers. In the foregoing, the concomitant and index of scholarly research declined in terms of output, quality and regularity of publications due to a decline in funding for education (Mlambo, 2007).

However, there has been a sustained effort towards strengthening scholarly communication in Africa since 2002 following the setting up of various collaborations between the Dag Hammarskjold Foundation, the African Books Collective (ABC) and the International Network for Availability of Scientific Publications (INASP) (Mlambo, 2007). Indeed, recent studies (INASP, 2012) show that scholarly publications in Africa are recording growth again especially over the last two decades (see Table 1.1), even though this is still too slow compared to the developed world. This growth is closely related to the efforts of leading institutions in each country.

New Technologies are making scholarly communication more economically viable hence reviving interest in higher education and scholarship in Africa after a long period of neglect and decline. There has been a visible effort to utilise technology to expose African scholarly publications to the rest of the world. One meaningful effort is the setting up of the African Journals Online (AJOL), which is a digital platform providing free hosting for over 400 peer-reviewed journals from 30 African countries, using the Internet and open source software. AJOL's partner journals cover the full range of academic disciplines with particularly strong sections on health and agriculture.

The AJOL website is visited each month by an average of 150,000 researchers from all over the world (AJOL Website accessed on 16<sup>th</sup> March, 2016). Today, AJOL is the world's largest online collection of African-published, peer-reviewed scholarly journals. It seeks to increase online visibility, access and use of African-published research output in support of quality African research and higher education.

**Table 1.1: Total scholarly publications from selected African countries between 1996-2009**

<b>Country</b>	<b>Number of Publications (1996-2009)</b>
<i>South Africa</i>	<i>82, 043</i>
<i>Nigeria</i>	<i>24, 805</i>
<i>Tunisia</i>	<i>22, 216</i>
<i>Morocco</i>	<i>18, 090</i>
<i>Algeria</i>	<i>14, 430</i>
<i>Kenya</i>	<i>11, 420</i>
<i>Tanzania</i>	<i>5, 239</i>
<i>Cameroon</i>	<i>4, 939</i>
<i>Ethiopia</i>	<i>4, 849</i>
<i>Uganda</i>	<i>4, 395</i>

***Source: INASP, 2012 Scientific Development Report for Africa***

### **2.5.3 The Status of Scholarly Communication in Kenya**

Kenya has one of the most active scholarly communication activity in Africa even though the country has faced similar challenges of underfunding and brain-drain as have many African countries. Scholarly communication in Kenya rose significantly at independence but began to decline in the mid 1970's due to underfunding, brain-drain, over enrolment and government censorship (Chakava, 2007). In the 1970's, the expression "publish and perish" became more fashionable among lecturers at the University of Nairobi as the government engaged in censorship of what university presses were publishing. The result was that some scholars disappeared mysteriously, many were sent into exile while some

were either demoted or dismissed. Since then, scholarly publishing in Kenya has continued to decline. Today, the state of scholarly research publishing in terms of output and sustainability is still very poor. Challenges identified include market unavailability, editorial incompetence, poor quality of research papers, cost and dependency on developed countries (Chakava, 2007).

Despite the challenges, Kenya still ranks among the top ten African countries with the highest concentration of scholarly communication activity in Africa as shown in Table 1.1 (Quarshie & Oisefuah, 2010; INASP, 2012). In its ranking, the UNESCO Science Report (2015; 286) puts Kenya at position three behind South Africa and Nigeria respectively in terms of science publications based on statistics for the year 2008. The other African countries with notable scholarly communication activity are Cameroon, Tanzania, Ethiopia and Uganda respectively. This means that Kenya is the leading nation in Eastern Africa in terms of scholarly publications output. As shown in Table 1.2, nine of the seventeen most productive scholarly communication institutions in Eastern Africa are from Kenya. Table 1.3 shows the number of scholarly publications in Kenya between 1996 and 2009 as compared to the total world output. From the statistics, it is evident that Kenya's scholarly communication still has a negligible contribution at 0.05% to the world research output (INASP, 2012).

The most common publishers of scholarly works in Kenya are university presses and research organisations. As shown in Table 1.2, this is the trend in other nations in Eastern Africa. According to Sawant (2012), university presses are important members of the scholarly communication process. Many of these presses are institutional based and since many scholars are likely to be based in universities, university presses help to advance the work of these scholars to a large extent.



**Table 1.2: Most productive scholarly institutions in Eastern Africa**

Organisation		Publications per year								Total
		2003	2004	2005	2006	2007	2008	2009	2010	
Makerere University, Uganda		140	194	191	218	288	324	384	320	2059
University of Nairobi, Kenya		168	195	195	203	252	259	255	203	1730
Addis Ababa University, Ethiopia		122	141	145	191	248	216	214	233	1510
Kenya Medical Research Institute		145	177	153	193	179	242	238	160	1487
University of Dar es Salaam, Tz		74	86	89	97	111	125	107	100	789
Muhimbili University of Health and Allied Sciences, Tz		48	67	77	100	111	114	130	101	748
ILRI, Kenya		114	81	74	64	82	75	92	81	663
Sokoine University of Agriculture, Tanzania		64	60	69	91	90	70	87	75	606
Uganda Ministry of Health		49	74	67	71	67	70	61	54	513
ICRPE, Kenya		61	43	60	87	74	85	53	45	508
Kenyatta University, Kenya		51	49	48	81	70	71	51	44	465
National Institute for Medical Research, TZ		22	39	40	58	74	72	62	64	431
Moi University, Kenya		38	44	45	47	65	37	40	51	367
Ethiopian Institute of Agricultural Research		23	18	50	56	53	63	46	29	338
World Agroforestry Centre, Kenya		32	45	44	67	46	35	16	16	311
Egerton University, Kenya		25	31	35	61	58	39	22	22	291
KARI, Kenya		23	17	37	59	54	28	25	25	268

***Source: INASP, 2012 Scientific Development Report for Africa***

**Table 1.3: Output of scholarly publications from Kenya (1996-2009)**

Year	Output and impact	
	Number of Publications	World Percentage (%)
1996	637	0.06
1997	635	0.05
1998	586	0.05
1999	607	0.05
2000	567	0.05
2001	603	0.05
2002	673	0.05
2003	807	0.06
2004	802	0.05
2005	864	0.05
2006	986	0.05
2007	1,154	0.06
2008	1,193	0.06
2009	1,306	0.06
<b>Total</b>	<b>11,420</b>	<b>0.05</b>

*Source: INASP, 2012 Scientific Development Report for Africa*

#### **2.5.4 The Role of University Presses in Kenya's Scholarly Communication**

University press publishing evolved in the late fifteenth and sixteen centuries from the early presses of Oxford and Cambridge in the UK. It was introduced in the United States in the late nineteenth century; and much later to the rest of Europe. The purpose of the university press is to provide an outlet for the publication of research by faculty members of its own and other universities and extend the instructional function of the parent institution by publishing and disseminating knowledge and scholarship as widely and as economically as possible to both scholars and educated laymen. It publishes learned books of small sales potential and limited possibility of financial returns that commercial

publishers cannot profitably undertake and gains favourable publicity and prestige for the university of which it is part (Darko-Ampem, 2003).

University presses have been instrumental in scholarly communication in many African countries although their activity has been hampered by various challenges ranging from poor funding to an underdeveloped scholarly communication production and distribution infrastructure. Among the African countries with notable scholarly communication activity driven by university presses include South Africa, Nigeria, Tunisia, Kenya, Morocco, Tanzania and Cameroon (INASP, 2012).

University presses came up in Kenya over the years with the main aim of publishing research findings generated by their institutions e.g. University of Nairobi Press which came up in 1984. With time, financial support to these presses reduced significantly due to economic decline and SAPs introduced by donors (Chakava, 2007). As financial resources dwindled and pressure for university presses to be self-reliant increased, most of them went into publishing school textbooks and even children's books in order to generate the much-needed income. The effect of this on scholarly communication was that with time, commercial interests overrode scholarly interests and in no time, some of these university presses were publishing more commercial books than scholarly publications.

Consequently, other universities have opened their own publishing presses over the years, although some of them remain undocumented. The Kenya Publishers Association Website lists Catholic University Press, Moi University Press (1989), in addition to University of Nairobi Press (1984) as the three university presses in Kenya who are members of the association. Other universities with publishing units include Egerton University, Kenyatta University and Masinde Muliro University of Science and Technology. Apart from university presses, other players involved in scholarly communication in Kenya include (Chakava, 2007): Commercial publishing houses, Independent journals, and Learned or professional societies.

Local and international research centres have also participated to a large extent in scholarly publishing in Kenya (Chakava, 2007; INASP, 2012) as shown in Table 1.2. These include The International Medical Research Foundation (AMREF), the International Centre for Insect Physiology and Etymology (ICIPE), and the Academy of Science Publishers, etc. The most preferred medium of scholarly communication for most of these publishers is the academic journal. Many of these university presses as well as other independent journal publishers are in danger because of economic challenges and competition especially with the advent of open access publishing and self-archiving. Unfortunately, many journal publishers in Kenya still prefer the traditional print publishing model which is expensive and unnecessarily lengthy.

#### **2.5.5 Use of New Media in Scholarly Communication**

New media are taken to be those methods and social practices of communication, representation, and expression that have developed using the digital, multimedia, networked computer and the ways that the computer has transformed work in other media. The term new media, therefore, generally refers to those digital media that are interactive, incorporate two-way communication, and involve some form of computing (Logan, 2010). Many new media platforms emerged by combining an older medium with computer chips and a hard drive. Hence the term new media refers to a wide range of technological, textual, conventional and cultural changes in media production, distribution and use.

There are three important new media forms which affect scholarly communication. These are (1) open access archives, (2) open access publishing and (3) Web 2.0 tools (Sawant, 2012). Web 2.0 tools identified include: Online documents, multimedia sharing, social networks, tagging, Wikis, RSS, miniblogs, and blogs (Gu and Widen-Wulff, 2010). According to Houghton, et al. (2009), there are three alternative models for scholarly publishing presented via new media. These are: Subscription or toll access publishing, open access publishing and open access archiving.

New media come from the particular ways in which older media are refashioned and the ways in which older media refashion themselves to answer the challenges of new technology. Jenkins and Thorburn (2004) talk about “an accommodation between old and new” and point out that “new media are often heavily reliant on repackaged older media content”. Some scholars have termed this process as remediation (Logan, 2010).

Although universities continue to invest considerable resources in ICTs and new infrastructure to support learning and research activities in the institutions, there is a huge shortage of relevant resources to support the use of new media in scholarly communication. Omwenga (2016), in a report on Science and Technology Status in Africa, reported that the average staff-computer ratio within faculties of science and technology in the majority of universities found in Africa stood at one computer per two staff members. On average, there were about 6.5 computers per basic science courses and about 9.1 computers per engineering course. The report further adds that one out of three departments provided computers to all their staff members. The report also emphasized the need to improve access to ICT facilities to effectively use them in institutions of higher learning. This means that the universities need to install modern ICTs to support the use of new media in scholarly communication.

UNESCO (2013) observes that the access to educational technology has increased significantly in recent years, although such progress is not uniform across different countries or regions. By 2015, the growth of mobile broadband stood at 40% in developed countries and 78% in developing countries (UNESCO, 2015). In Africa, mobile telephony has revolutionized communication over long distances and it has presented an immeasurable opportunity for the education sector. Mobile technologies can be used to support scholarly communication in terms of increasing access to research outcomes. Educators are advancing ICT competency-based instruction on the realisation that traditional teaching methods are becoming obsolete due to the introduction of ICTs in

education. New media are important if universities are to remain centres of knowledge production.

Despite the many challenges of access and availability of local scholarship identified in this study, scholarly communication in Kenya can still benefit from the advantages presented by new media to increase circulation of Kenya's scholarship across the world. Open archiving can also offer great potential as a route through which scientists and scholars in developing countries can achieve access to scholarly publications across the world.

New media allows ease of accessibility to other publications across the world which can inform Kenyan researchers in conducting research and writing their scholarly works. New media also makes it easy to publish scholarly work by providing an easier avenue that can navigate the traditional barriers to publishing. In addition, new media also opens new unlimited avenues for scholarly communication which would have otherwise been limited by traditional print media (Rao, 2001; Vrana, 2011). Self-archiving allows authors to skip the lengthy processes of peer review by allowing them to upload their written work on online open access digital repositories. However, some scholars do not consider any publication that does not undergo peer review as scholarly (Sawant, 2012; Bgoya 2007; and Horowitz and Curtis 1995). This view is supported by Houghton, et al. (2009), who argues that some scholarly publications arising from self-archiving often have limited quality control, with a mix of peer reviewed and non-peer reviewed content hence the academic quality of such publications may be compromised. On the contrary, other scholars argue that the transition of journals from print to electronic has been made necessary by factors such as cost, delays in publishing and accessibility, and does not seem to aim at dilution of any of its scholarly characteristics (Mahmood et al, 2011). New media saves time in the publishing chain through eliminating such lengthy barriers involved in peer review, sourcing for papers and printing. A journal paper can be issued on demand

without having to wait for an issue to have enough quality papers before all can be published in together.

New media also makes scholarly communication less costly (sometimes free). Self-archiving on online digital repositories is often free and does not require that authors pay publishing fees (Omwoha and Gakahu, 2010). Conducting research is also made cheaper as authors who refer to studies available by open access do not need to pay expensively either to subscribe to or buy their source material. This should enable Kenyan researchers to have unlimited access to as many sources as possible while writing their scholarly works.

One area of scholarly communication where there has been a tremendous influence of new media is the journal where electronic journals have been on the rise. The arrival of the web saw the proliferation of e-journals in all disciplines, and these found widespread, enthusiastic acceptance by end users. Whereas some e-publications replicate existing print publications; some exist only in electronic form. According to Mukherjee (2009), there are at least four kinds of e-journals in the post-web era. These are: (i) Pure e-journals which are originally distributed only in digital form; (ii) E-p journals which are primarily distributed electronically, but may have very limited distribution in paper form; (iii) P-e journals which are primarily distributed in paper form, but are also distributed electronically; and (iv) P+e journals which are initiated with parallel paper and electronic editions that may be widely distributed.

## **2.6 Empirical Review of Relevant Studies**

A number of studies have been conducted on new media use in scholarly communication across the world though the depth of such studies in Kenya is very limited. Vrana (2011) conducted a study in Croatia on the transformation of scholarly publishing in the digital era from scholars' point of view. The study found a strong orientation (88.5%) of scholars towards publishing in the traditional print media, especially the print journal. Only a tiny

7.7% published in electronic journals. However, this study did not look into the reasons why the authors were not adopting new media in their scholarly communication activities. Likewise, the study did not interrogate whether there were enough resources to support the use of new media in scholarly communication in universities in Croatia. The present study covered these two important elements.

A study on the impact of computer usage on scholarly communication among social scientists conducted by Costa and Meadows (2000) in Brazil found that major changes were occurring in communication habits of social sciences as a result of new media use. Interestingly, this study attributed these changes in part to pressures from the research community and from the institutional environment. It would appear, from this study, that the advantages of new media over traditional media may not be responsible for the apparent rise in the use of new media in scholarly communication. This study, obviously, failed to investigate aspects of perceived usefulness and ease of use of new media and whether these played a role in the shift. These were taken care of in the present study which sought to outline the role of factors such as performance expectancy, social influence and facilitating conditions on the use of new media technologies on scholarly communication.

Another study was conducted in Finland by Gu and Widen-Wulff (2010) on the influence of social media on scholarly communication. It was aimed at providing an overview of researchers' use of Web 2.0 techniques and to discuss a possible change of information behaviours in the context of scholarly communication. The study found that Web 2.0 tools were well-known to researchers, especially blogs (85.7%), wikis (92%), social networks (91.3%), multi-media sharing (92.9%), and online documents. However, respondents reported to use more multimedia sharing and social networks in everyday life than in research or teaching. The study recommended that researchers need to be enlightened to translate this knowledge into practical use of these Web 2.0 tools to favour their scholarly communication in future. Whereas this study demonstrates the existence of relevant



resources to support the use of new media, it did not outline the factors influencing the use of such new media in scholarly communication. This was the main concern of the present study.

Locally, a study by Darko-Ampem (2003), investigated the policies and practices of five university presses in Africa, including Kenya. This study investigated how effective the presses have been in terms of what they were set up to do—publish scholarly works. It examined and described their policies and programmes in the face of challenges that confront them as developing country presses and revealed and explained factors known to stifle growth in African university publishing. The study found that the coping strategies adopted by the African university presses in the face of harsh environmental conditions include the introduction of ICTs in their operations. The other strategies were changes in the treatment of authors, editorial policy on publishing non-scholarly materials, staff levels and use of outsourcing, and approaches to sources of funding. The study recommended the introduction of ICTs, including electronic mail and facsimile, as part of the press infrastructure for the exchange of information and the transfer of documents. It argued for the hastening of the introduction of e-publishing and print-on-demand technologies. However, this study did not address the use of new media in scholarly publishing and the factors influencing the acceptance of these media. The present study addressed this gap while at the same time noting that very little research has been conducted locally on this topic.

Other local studies have mainly focused on the use of social networking sites (SNS) in the delivery of higher learning as well as library services. A study by Gichora and Kwanya (2015), showed that in Kenya, librarians mostly use SNS for delivering services to their users but they hardly engage such users in using these sites for scholarly communication. Nkatha, Kimwele and Okeyo (2015), studied the extent to which tutors at JKUAT were using SNS to teach their students. They found evidence that tutors were using SNS for teaching at higher institutions of learning. However, they did not report any evidence of

use of these sites for scholarly communication, that is for creation and dissemination of research output and scholarly work.

## **2.7 Critical Review of Existing Literature**

From the literature discussed in this chapter, it emerged that scholarly communication in Kenya faces major challenges, some of which have been identified by a number of authors (Chakava, 2007, Ochola and Ochola, 2007, Darko-Ampem, 2003). These challenges include severe economic conditions which lead to high costs of publishing, poorly established distribution outlets for scholarly publications, low levels of literacy, lack of clear policy regarding the development of the industry, low structure and size of the publishing industry, and the poor positioning of the academic system in Kenya. But studies elsewhere have shown that new media can help navigate around some of these challenges (Gu and Widen-Wulff, 2010). Other studies by Beer (2008) have also shown that with new media tools, researchers in Croatia and India have more options when they develop their scholarly communication by new information behaviours, which extend and enrich the meaning and the environment of social media.

Indeed, the development of the Internet has had great implications on research dissemination and scholarly communication (Walsh et al, 2000); especially in the areas of accessibility and availability. The exploding growth of information has forced individual researchers to become specialised in adjusting to specialised research dissemination forums. The ways of scholarly communication and research dissemination have been substantially affected via more convenience, availability and low cost of production of information (Meadows, 2003). New media has the potential to expand local scholarly publications to the global stage. However, the extent to which scholars in Kenya are embracing new media in disseminating their works of scholarship remains unknown. Existing literature in Kenya has not sufficiently covered this area.

Most studies conducted on technology and scholarly communication in Kenya have tended to focus on the influence of ICT on the academic research process. Indeed, the

benefits of ICTs in university education cannot be limited to only teaching and learning. They can be very valuable resources for research conducted by lecturers and students and for scholarly communication. According to Sim (2016) students from all disciplines and different levels have to use ICT in some form throughout the process of their research, including the preparation, fieldwork, analysis and writing phases of their studies. A study conducted by Shaw (2000) cited in Sim (2016) that examined students' academic computing attitudes, uses, needs and preferences, reported that (83%) of the students agreed that they used the ICT skills which they possessed in research preparation phase such as searching information about the topic and in the writing phase. In addition, students also used computer skills in doing regular course work as well as interacting with their lecturers. Students' perceptions were captured in comments such as: 'Using a computer makes me more organized in my graduate work'; 'Using a computer makes me more motivated to do my graduate work'; 'Sharpening my computer skills in graduate school is essential in my professional work'.

According to Zare-ee (2011) tools such as emails, wikis, and blogs, databases, analysis software, and many other forms of ICTs and new media can be employed in all stages of the research process from choosing the research topic to collection of data, to data analysis, to summarizing findings, and to drawing practical implications from the discussion of results. Information and Communication technologies can therefore, help university lecturers and students in teaching, learning and research.

Mugenda (2008) argues that there is a direct relationship between ICT and Research. He argues that technology is the quality of technical skills, processes, tools and capital equipment, raw materials and human capital and it is a function of scientific research. He further asserts that the work of the researcher is to create technologies that are meant to improve the quality of people's lives. Similarly, ICT makes the work of the researchers easy and fast to complete.

Through use of modern technologies, aspects of a research such as literature review, identification of research gap, data analysis by using various types of software such Statistical Package for Social Sciences (SPSS) and Statistical Analysis System (SAS) are done easily within the shortest time (Sim, 2016). Moreover, with the advancement of ICT, tools have been developed to record voice (tape recorders), there are image recording equipment such as videos, a camera for capturing actions, events and gestures (Mathur, 2016). Use of these technologies and tools nowadays plays a big role in collection of qualitative data. This has enhanced data collection techniques. Kilemi et.al (2007) argues that universities can use ICTs to provide the information necessary for research. They point out that digitalization of research findings ensures wider dissemination and access to the research findings, storage and retrieval of research data which further promotes the discovery of knowledge. However, literature accessed is does not go beyond ICT to establish how new media (a function of ICT) can support research and scholarly communication in Kenya despite this having been tried successfully in many developed countries.

## **2.8 Research Gap**

A number of gaps were identified in existing literature on scholarly communication in Kenya. For instance, literature reviewed did not answer the following questions adequately concerning scholarly communication in Kenya: How do Kenyan researchers use media to communicate their findings? Can a research culture exist without proper established local and regional channels of scholarly communication, including new media? To what extent are Kenyan researchers making use of new media to address some of the challenges of access and visibility of local scholarly publications? This study was particularly interested in answering the questions that relate to use of new media in scholarly communication.

Literature accessed largely acknowledges that the use of new media, especially social media, in Kenya is widespread mostly among youthful populations and its increasingly being used in politics (Kamau, 2013; Ndavula, 2018). However, new media are mostly

used for social networking and hardly for scholarly communication. Studies demonstrate that there is also increased use of ICT in research and scholarly communication but most of these studies have not looked at the influence of new media in scholarly communication among university lecturers.

Many factors need to be put in place to encourage university lecturers to use new media platforms to support their scholarly communication activities. These include ensuring availability of ICT and new media infrastructure, utilisation of new media for scholarly work, building networking and collaborations among researchers across social media, and enhancing institutional support towards the use of new media in scholarly communication. This study established this as major gap in literature and sought to establish the determinants of use of new media in scholarly communication in Kenya among university lecturers as major players in research and scholarly communication.

## **2.9 Summary of Literature Review**

This Chapter has discussed the key theories that were applied in this study: the unified theory of technology acceptance and use (UTAUT) and the uses and gratifications theory. The various concepts and constructs of the study were also analysed in the form of the conceptual framework. This framework was based on the two major variables of the study: determinants of use of new media (independent variable) and scholarly communication (dependent variable). These variables were discussed in detail in this chapter. Under the independent variable, effort expectancy, performance expectancy, facilitating conditions and social influence were analysed in terms of how they influence the use of new media in scholarly communication. Gender, age, attitude, academic rank and anxiety were also discussed as the moderating variables. Finally, the chapter reviewed relevant literature related to the dependent and independent variables. The study noted that the topic had not been studied widely in Kenya and that literature was scattered. However, the available literature presented gaps which are discussed in 2.9 below.

Reviewed literature has shown a relationship between new media use and increased access to scholarly communication outcomes. In as much as new media is now being used as a tool for instructional delivery, literature suggests that such media can be deployed successfully to support the dissemination of research findings and other related scholarly communication activities. Massification of higher education, coupled with knowledge economy (K-economy) puts the government and the scholarly community under pressure to provide an enabling environment for research and publishing. In Africa and Kenya in particular, new media use has been embraced by many people because of its flexibility and its ability to connect people. However, the use of such media to support research activities has been limited.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Introduction**

This chapter presents the research design, target population, description of sample and sampling procedures, as well as description of data collection instruments that were used in this study. This is followed by instrument validity and reliability, data collection, data analysis procedures and ethical considerations the study adhered to.

#### **3.2 Research Design**

A research design is the specific method a researcher uses to collect, analyse, and interpret data. It is the programme that guides the investigator as he or she collects, analyses, and interprets observations in order to answer the research questions (Stangor, 2011; Nachmias & Nachmias, 1996). It is a logical structure that ensures that all collected evidence helps eliminate bias when evaluating theories and arriving at conclusions. According to Kerlinger (2000), such a systematic method enables researchers to answer the research questions as validly, objectively, accurately and as economically as possible.

This study used the cross-sectional survey design approach. In a cross-sectional survey, data is collected at one point in time from a sample selected to represent a larger population (Nachmias and Nachmias, 1996). This design enabled the collection of data from a larger population consisting of university lecturers in the selected public universities using a sample of 152 respondents.

#### **3.3 Target Population**

Population can be described as the total number of subjects or cases that conform to some designated set of specifications (Bird, 2009). The target population for this study was lecturers in public universities in Kenya. University lecturers were selected because of the nature and demands of their jobs which require that they continuously engage in research

activity and “publish their research findings or perish”. Their promotion and tenure are determined by their research and publishing activities.

According to the Ministry of Education, Science and Technology (2017), there are about 9,000 full time lecturers in public universities and constituent colleges in Kenya ranging from the grades of Assistant Lecturers all the way to Full Professors. Specifically, the targeted lecturers were from the University of Nairobi, Kenyatta University, Moi University, Egerton University and Jomo Kenyatta University as explained in 3.5.1 below. The study sought to establish how these lecturers were engaging with new media in meeting this requirement and the determinants of their adoption of these new media technologies in their scholarly communication activities.

### **3.4 Sampling Frame**

In statistics, a sampling frame is the source material or device from which a sample is drawn. It is a list of all those within a population who can be sampled, and may include individuals, households or institutions (Cresswell, 2007). The sampling frame for this study comprised of departmental and faculty-based lists of all lecturers teaching in the five universities. These lists were retrieved from the Websites of those universities which had the profiles of the lecturers. The five sampled universities had provided profiles of their lecturers on their websites based on the departments where they belong. These profiles helped to generate a sampling frame which was applied in the study.

### **3.5 Sample Size and Sampling Techniques**

Sampling refers to selecting a number of individuals or objects from a population whose characteristics are representative of the entire group (Gillham, 2010; Kumar, 2011). It is a deliberate selection of a predetermined number of subjects from a given study for the purpose of representing the entire group in the study (Cohen, Morrison & Manion, 2007, 2011; Kerlinger and Lee, 2000). The essential requirement of any sample is that it should be as representative as possible of the population from which it is drawn. A sample is



therefore considered to be representative if the analyses made using the researcher's sampling units produce results similar to those that would be obtained had the researcher analysed the entire population.

This study used both probability and non-probability sampling methods to select the sample that participated. According to Nyandemo (2007), probability sampling is a sampling technique wherein the samples are gathered in a process that gives all the individuals in the population an equal chance of being selected. In this technique, the researcher must guarantee that every individual has an equal opportunity for selection. This can be achieved if the researcher utilizes randomization. This technique was used in selecting individual lecturers from the five universities as discussed in 3.5.2.

Nyandemo (2007) defines non-probability sampling as a sampling technique where the samples are gathered in a process that does not give all the individuals in the population equal chances of being selected. In any form of research, true random sampling is always difficult to achieve because most researchers are bounded by time, money and workforce and because of these limitations, it is almost impossible to randomly sample the entire population and it is often necessary to employ non-probability sampling technique. This technique was used in selecting the universities and lecturers as discussed in 3.5.1 and 3.5.2.

### ***3.5.1 Universities***

In 2017, statistics from the Commission for University Education ([www.cue.or.ke](http://www.cue.or.ke)) indicated that there were 23 public universities in Kenya and 10 public university constituent colleges (CUE Website, accessed 16<sup>th</sup> March, 2017). This study used purposive sampling technique to select five out of the 23 public universities in Kenya. The five universities were selected based on two reports by independent international bodies which ranked the universities according to their research output, among other parameters. The first report by International Availability of Scientific Publications (INASP, 2012)

indicated that University of Nairobi, Kenyatta University, Moi University, Egerton University and Jomo Kenyatta University, in that order, were the leading institutions with notable scholarly communication activity in Kenya and Eastern Africa (Table 1.2). The second report by Webometrics (2017) ranked University of Nairobi, Egerton University, Kenyatta University, Jomo Kenyatta University of Agriculture and Technology and Moi University as the five leading universities in Kenya by research output as well as web presence. The Webometrics Rank of a university is strongly linked to the volume and quality of the contents it publishes on the Web. Such contents should be originated by the faculty and other members of the university or by special agreement with external authors (<http://www.webometrics.info/en/Africa/Kenya%20>).

As stated by Cresswell (2007, 2014) the purposive sampling technique enables the researcher to select a sample that he/she considers to be the most appropriate for the study. The selection of a purposive sample is often accomplished by applying expert knowledge of the population to select a sample of elements that represents a cross-section of the population in a non-random manner (Kerlinger and Lee, 2000). This is done using judgment and a deliberate effort to obtain a representative sample by including presumably typical areas or groups in the sample. The universities which were purposively sampled for this study were identified by both INASP (2012) and Webometrics (2016) as having a substantial scholarly communication activity in Kenya.

### **3.5.2 Lecturers**

Respondent lecturers were selected from the Schools/Faculties of Arts and Social Sciences in all the five public universities. The Faculty/School of Arts and Social Sciences was selected because all the five universities had this faculty or its equivalent. In addition, the faculty carried several departments and courses in all the five universities hence this yielded enough respondents from diverse backgrounds as shown in Table 3.1. Information on the departments in the Faculty/School of Social Sciences in all the five universities was established from the Websites of these universities.

The researcher used stratified random sampling to sample lecturers to take part in the study. Stratified sampling involves dividing the population into homogeneous groups, each group containing subjects with similar characteristics (Gillham, 2010; Bryman, 2012). The lecturers were stratified according to their universities. The use of stratified sampling assured that the numbers of lecturers in the sample were representative of each of the universities.

Systematic random sampling was used to sample the lectures who were issued with questionnaires. In systematic random sampling, the subjects were selected from a list in a systematic manner. An element of randomness was introduced into this kind of sampling by using random numbers to pick up the unit with which to start. In this method, for example, the selection process started by picking some random point in a list and then every  $n^{\text{th}}$  element was selected until the desired number was acquired as advised by (Cohen, Manion and Morrison, 2011). This rule was applied to get a sample from each university. Systematic sampling was found appropriate because in instances where the lecturer was not on-campus and he/she was supposed to be issued with a questionnaire; the researcher contacted them through their mobile phones and emails.

Several factors affect the decision on sample size. Such factors include availability of funds, time and the geographical distribution of the target population (Glasgow, 2005, Kerlinger, 2000) as well as homogeneity of a population (Yount, 2006). According to Bhattacharjee (2012), the idea in sample size is to ensure representativeness of the characteristics of the population in the sample. The size of the sample should neither be excessively large, nor too small (Byman, 2012). Babbie (2011) recommends that for descriptive studies, a sample size should be between 10 - 20%. Gay and Mills (2011) suggest 10% for large populations and 20% for small populations. According to Borg and Gall (2003), 20 – 30% of the total population is representative. Thus, based on this study, 152 respondents were within the 20-30% of the accessible population and therefore they were deemed representative enough. In some universities where the respondents were very

few, the sample size exceeded 20% so as to be more representative as argued by Babbie (2005). However, the target population was 626 hence 152 respondents represented 24% of the accessible population.

**Table 3.1: Lecturers' sampling matrix**

<b>University</b>	<b>Faculty/School</b>	<b>Study population</b>	<b>Percentage</b>	<b>Sampling Technique</b>	<b>Sample Size</b>
University of Nairobi	Faculty of Arts	264	20	Systematic	53
Kenyatta University	School of Humanities and Social Sciences	173	20	Systematic	35
Moi University	School of Arts and Social Sciences	109	30	Systematic	33
Egerton University	Faculty of Arts and Social Sciences	64	30	Systematic	19
JKUAT	School of Communication and Development Studies	16	75	Systematic	12
<b>TOTAL</b>		<b>626</b>	<b>24</b>		<b>152</b>

Source: Websites of the Five Universities

### **3.6 Data Collection Instruments**

This study used a questionnaire as the main data collection instrument to collect data from lecturers. The questionnaire was administered to the lecturers (Appendix II) in the five universities. The questionnaire contained mostly closed ended questions as this was a

quantitative study. Bird (2009) argues that closed ended questions provide the survey with quantifiable and in-depth results. He adds that closed questions produce results that are easily summarised and clearly presented in quick-look summaries.

Venkatesh et al (2003), used survey items from the previous eight models in drawing up UTAUT. Each construct had between 3-5 items. This study adopted these survey items from the original study of UTAUT but with minor modifications to fit the context of scholarly communication. Consequently, based on the original instrument designed by Venkatesh et al (2003), this researcher designed an instrument to capture the constructs of the study as shown in Appendix III.

The questionnaire was divided into two sections. Section A dealt with background information which included respondent's age, gender, their university, rank, and their education level. These background factors were important because they catered for most of the personal factors whose moderating influence was sought by objective five of the study. Section B had eight questions that covered the following areas:

Question	Coverage
----------	----------

- |    |   |
|----|---|
| 1. | Involvement of respondents in scholarly publishing  |
| 2. | New media tools preferred by respondents for scholarly publishing                                     |
| 3. | Performance expectancy of respondents using new media in scholarly communication                      |
| 4. | Effort expectancy of respondents using new media in scholarly communication                           |
| 5. | Attitude towards using new media in scholarly communication   |
| 6. | Effect of social influence towards using new media in scholarly communication                         |
| 7. | Perceptions on the adequacy of facilitating conditions for using new media in scholarly communication |
| 8. | Effect of personal factors on using new media in scholarly communication                              |

### **3.7 Data Collection Procedure**

The researcher obtained an introduction letter from Jomo Kenyatta University of Agriculture and Technology (Appendix V) which was used to apply for a research permit from the National Council for Science, Technology and Innovation (NACOSTI) and the Ministry of Education, Science and Technology (Appendix IV). In addition, the researcher prepared a personal letter of introduction which was attached to the questionnaire (Appendix I). A letter of introduction is an important aid in gaining cooperation with the respondents during data collection. A good explanation of the purpose of the project (and why the respondent is important to the project) is an important factor in obtaining a high response rate to a questionnaire (Bird, 2009). Initial contact in the form of a cover letter, telephone call or direct approach is the first step to building rapport and motivating participation in a study. The letter served to establish the credibility of the research. The letter also captured the attention and interest of the respondents, and outlined the ethical obligations, such as confidentiality and voluntary participation.

The researcher then visited the five universities to administer the questionnaires in person, with the assistance of two research assistants. The research assistants were briefed on the topic and significance of the study. They were given information on the respondents to whom the questionnaires were to be issued to and guided on the process of data collection to ensure ethical considerations were observed. This method of distributing the questionnaires was used because the respondents were many and distributed in the five universities across the country. After the data collection exercise was concluded but before data analysis, the researcher addressed issues of non-response error and missing data. This study recorded a response rate of 85.5%. Some researchers argue that a response rate of 70% or higher is desirable; lower response rates call into question the representativeness of the sample (Glasgow, 2005).

### **3.8 Validity and Reliability of Research Instruments**

Reliability refers to the consistency of a question; that is, the probability of obtaining the same results if the question is duplicated (Kerlinger and Lee, 2000). Validity refers to whether or not the question measures what it was intended to (Kothari, 2004). In order to achieve reliability and validity, questions should be short and simple. The following mechanisms were employed to ensure validity and reliability of the data collected.

#### **3.8.1 Validity**

The term validity refers to the degree to which a research instrument measures what it purports to be measuring (Orodho, 2005). It refers to a researchers' ability to make meaningful and justifiable inferences from scores about a sample or population (Creswell, 2005). It is the degree to which results obtained from the analysis of the data represent the phenomenon under investigation. Two types of validity were tested: face validity and content validity. Content validity refers to whether an instrument provides adequate coverage of a topic. It refers to the representativeness of the content of the topic (Kerlinger & Lee, 2000).

Face validity refers to the likelihood that a question will be misunderstood or misinterpreted. Pre-testing a survey is a good way to increase the likelihood of face validity (Kerlinger and Lee, 2000). Expert opinions and literature searches will help establish content validity. After preparing the instruments, the researcher gave them to experts in Scholarly Publishing and Online Communication and asked them to read and judge whether the questionnaires had adequate content in the area to be tested. The questionnaire was also shared with the supervisors of this study who gave input which was incorporated in the final instrument. The opinion of the experts and supervisors helped restructure, improve or discard parts of the instruments that were found invalid.



### **3.8.2 Reliability**

Reliability is a measure of the degree to which a test consistently measures whatever it should measure (Gay, 1987). Reliability in research is influenced by random error, which is the deviation from a true measurement due to factors that have not effectively been addressed by the researcher. These can be due to factors such as distraction when filling in a questionnaire, due to ambiguous instructions and technical difficulties. Researchers therefore can use commonly acceptable ways of estimating reliability. There are several ways of determining instruments' reliability. Kerlinger and Lee (2000) have identified the test retest method, parallel form and internal consistency techniques of testing reliability.

This study tested for internal consistency of the research instruments for reliability by use of Cronbach's alpha on the Likert scale question items. The method was used in this study because it is a type of internal reliability estimate used to assess the consistency of responses on a measure that contains more than one component (Nachmias and Nachmias, 1996). The value of the alpha coefficient ranges from 0 to 1. A higher value depicts more reliability of the instruments used in the study. In the study, the reliability for the questionnaires was found to be 0.814. According to Nunnally and Bernstein (1994) usually a coefficient of 0.7 and above is acceptable and it indicates good internal consistency of items in the scale.

### **3.9 Pilot Testing**

A pilot survey was conducted to test both the instruments and the survey procedures before the actual survey was conducted. Glasgow (2005) suggests conducting a pre-test with the questionnaire or interview schedule as a step to minimize problems before the actual data collection begins. It is suggested that for the pilot test, a sample of individuals similar to those planned for the survey sample are chosen. Generally, about ten to twenty respondents are asked to participate in the pre-test (Glasgow, 2005).

The pilot testing is important to establish the content validity of scores on an instrument and to improve questions (Creswell, 2014). The questionnaire and interview guide are generally revised, or rewritten, if the pre-test indicates that changes are needed. Pre-testing of the instruments was carried out at Maseno University's School of Arts and Social Sciences. Maseno University was chosen for piloting because it is a public university like the other five in the sample and it ranks 6<sup>th</sup> in both the INASP (2012) and Webometrics (2017) rankings of research output in universities in Kenya after the five universities in the sample. Maseno University also has a School of Arts and Social Sciences hence the respondents were expected to bear characteristics which are similar in the five universities. The questionnaires were distributed to ten lecturers in the School who were asked to fill them and return. The pilot study was used to identify those items that could be misunderstood, or misinterpreted. Such items were modified accordingly, thus increasing validity. For instance, some respondents advised that the facilitating conditions the study was seeking to establish be listed in the questionnaire to avoid confusion. This was incorporated in the final questionnaire.

### **3.10 Data Processing and Analysis**

The data collected was cleaned, coded and entered into the computer for analysis using the Statistical Package for Social Sciences (SPSS) version 20.0. SPSS is the most popular software, offering a powerful, fast and reliable statistical analysis for quantitative data (Sarantakos, 2007). The data was analysed by use of quantitative data analysis approaches. Descriptive and inferential statistics were used in presentation and description of the data. According to Gingery (2009), descriptive statistics are the basic measures used to describe survey data. They consist of summary descriptions of single variables (also called "univariate" analysis) and the associated survey sample. They include frequency and percentage response *distributions*, measures of *central tendency* (which include the mean, median and mode), and *dispersion* measures such as the range and standard deviation, which describe how close the values or responses are to central tendencies as shown in Table 3.2.

**Table 3.2: Data processing matrix**

No.	Research Question	Data Needed	Data Collection Tools	Data Analysis	Outputs
1.	What is the influence of performance expectancy on the use of new media in scholarly communication by university academic staff in Kenya?	Likert scores on performance expectancy based on constructs of performance expectancy.	Questionnaire	Descriptive statistics Pearson Chi-square	Frequencies and percentages Predictive power of performance expectancy
2.	To what extent does effort expectancy influence the use of new media in scholarly communication by university academic staff in public universities in Kenya?	Likert scores on respondents' measures of effort expectancy	Questionnaire	Descriptive statistics Pearson Chi-square	Frequencies and percentages Predictive power of effort expectancy
3.	What is the influence of social influence on the use of new media in scholarly communication by university academic staff in Kenya?	Likert scores on observability, complexity, trialability and compatibility of new media	Questionnaire	Descriptive statistics Pearson Chi-square	Frequencies and percentages Predictive power of

						social influence
4. What is the influence of Likert scores on Questionn	Descriptiv	Frequenci				
facilitating conditions on the use perception of aire	e statistics	es and				
of new media technologies in adequacy of	Pearson	percentag				
scholarly communication by facilitating	Chi-square	es				
university academic staff in conditions						
Kenya?						
5. What is the moderating Likert scores on Questionn	Descriptiv	Frequenci				
influence of personal factors in perception of aire	e statistics	es and				
the use of new media in effect of	Anova	percentag				
scholarly communication by personal	Spearman'	es				
university academic staff in characteristics	s Rho	Regressio				
Kenya?	Pearson	n model				
	Chi-square					
	Correlatio					
	n					
	coefficient					
	Regressio					
	n analysis					

### 3.10.1 Isolating factors associated with use of new media in scholarly communication

To isolate which independent variables indeed are associated with use of new media tools when the effects of all other variables are controlled for, the study used logistic regression analysis. Logistic regression analysis is a fairly straight forward procedure particularly because the odds ratios generated are easy to interpret and the relative contribution of each independent variable is determined.

The general logistic regression model is of the form:

$$p(\bar{x}) = \frac{\exp(\beta_0 + \beta_1 x_1 + \dots + \beta_p x_p)}{1 + \exp(\beta_0 + \beta_1 x_1 + \dots + \beta_p x_p)}$$

Where  $p(\pi)$  is the likelihood of making an observation and  $\beta$ s are regression coefficients and  $x$ s are the predictors in the model. To make the distribution linear, a logit transformation is carried out thus:

$$\log\left(\frac{p(\bar{x})}{1 - p(\bar{x})}\right) = \beta_0 + \beta_1 x_1 + \dots + \beta_p x_p$$

Odds ratios are computed by exponentiation of regression coefficients ( $\beta$ ). The odds ratios generated allow for direct observation of the contribution of each independent variable in the model.

The study utilised correlation and multiple regression analysis to determine the relationship between use of new media and scholarly communication among university academic staff in Kenya. Most of the results obtained were based on univariate and bivariate analysis of the various independent variables on the dependent variable. Such procedures do not allow for inclusion of statistical controls hence it is impossible to say with any level of certainty that indeed those factors predict use of new media tools in scholarly communication. For instance, it is entirely possible that use of new media tools is a function of age rather (an individual attribute) and not, say, performance expectancy. Hence to meet the overall goal of the study, it was necessary to subject the data to more robust statistical analyses that allow for inclusion of statistical control.

Thus, to isolate which independent variables are associated with use of new media in scholarly communication when the effects of all other variables are controlled for, the study used logistic regression analysis. Logistic regression analysis is a fairly straight forward procedure particularly because the odds ratios generated are easy to interpret and the relative contribution of each independent variable is determined.

After establishing the significant correlation between the selected independent variables and frequency of use of new media in scholarly communication, regression analysis was used to establish the relative importance of these independent variables to the dependent variable (use of new media in scholarly communication). From the signs of the regression coefficients ( $\beta$ ), the nature of association between the independent variables and dependent variable can be inferred. In order to compare and determine which of the independent variables is more important in relation to the dependent variable, standardized regression coefficient (Beta) was used. This was guided by the following regression model:

$$y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + e$$

Where:

y	dependent variable (frequency of use of new media)
X <sub>1</sub>	performance expectancy
X <sub>2</sub>	effort expectancy
X <sub>3</sub>	attitude
X <sub>4</sub>	social influence
X <sub>5</sub>	facilitating conditions
X <sub>6</sub>	anxiety

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$  regression coefficients (change in the dependent variable as a result of a unit change in the independent variable – x).

Based on the model above, logistic Regression was used to establish the relationship between the independent variables and the dependent variable of the study. Binary Logistic regression established relationships by converting a five-point Likert scale into two categories (high use and low use). The five-point Likert scale was; strongly agree (5),

agree (4), not sure (3), disagree (2) and strongly disagree (1). In such a scale, a midpoint was established. This was to infer that any score on the determinant of use of new media on scholarly communication which was more than 3.5 was a measure of agreement, while any score below 3.5 was a measure of disagreement. This approach is supported by Cohen, Manion and Morrison (2011).

Wald test was used to infer the significance of the relationship as generated by the Logistic Regression using five percent (5%) as the significance level. Omnibus Test and Hosmer and Lemeshow were also computed to test the fitness of the models. Benedict (2016) argues that before a model is relied upon to draw future prediction and to draw conclusions, goodness of fit test is supposed to be done to ensure that the model is fit against the statement that the model is not fit. According to Hosmer and Lemeshow test, a model is fit when the p-value is greater than 0.05 alpha and when the p-value is less than 0.05, the model fitness is poor. Using the Onimbus test, the model is fit when the p-values is less than 0.05 and when the p-value is greater than 0.05, the model is not fit. The resultant model that took into account the effect of moderating variables was as follows:

$$\ln (P/ (1-P)) = -0.381 + 1.973X_1 + 0.411X_2 - 0.027X_3 + 0.572X_4 - 0.528X_5 - 1.121X_6 + 1.170X_7$$

Where:-

P: Probability of use of new media in scholarly communication

$\ln (P/1-P)$ : Logit of use of new media in scholarly communication

$X_1$ : Performance expectancy

$X_2$ : Effort expectancy

$X_3$ : Social influence

$X_4$ : Facilitating conditions

$X_5$ : Anxiety

$X_6$ : Age

$X_7$ : Attitude

### **3.11 Assumptions of the Regression Model**

The regression model assumed the following:

#### **3.11.1 Linearity**

According to Bai and Peron (2008), linearity portends that the amount of change observed between scores on two sets of variables is constant for the entire range of scores for the variables. Granger and Tera (2007) add that it is the consistent slope of change that represents the relationship between an independent variable and a dependent variable. To correct the problem of linearity, outliers were removed hence the study could assume the linearity of the variables as proposed by Bai & Peron (2008).

#### **3.11.2 Reliability Test**

This study tested for internal consistency of the research instruments for reliability by use of Cronbach's alpha on the Likert scale question items. The method was used in this study because it is a type of internal reliability estimate used to assess the consistency of responses on a measure that contains more than one component (Nachmias and Nachmias, 1996). The value of the alpha coefficient ranges from 0 to 1.

#### **3.11.3 Testing for Normality**

The normality of data distribution was assessed by examining its skewness and Kurtosis. According to Kline (2005), a variable with an absolute skew-index value which is greater than 3.0 is extremely skewed while a kurtosis index greater than 8.0 in an extreme kurtosis.

### **3.12 Measurement of Variables**

Various indicators were used in measuring study variables. Independent, moderating and dependent variables were measured:



### **3.12.1 Measurement of Independent Variables**

The study used four independent variables which included performance expectancy, effort expectancy, social influence and facilitating conditions. Performance expectancy was measured by evaluating respondents' opinions on ease of use of new media in scholarly communication, its perceived usefulness, job fit, extrinsic motivation, relative advantage and outcome expectations (Venkatesh, 2003). Effort expectancy was measured by determining the effect of perceived ease of use and complexity on the use of new media in scholarly communication by university lecturers. Social influence was measured using respondents' opinions on the influence of subjective norms, social factors and image on the use of new media in scholarly communication. Finally, facilitating conditions were measured by evaluating respondents' opinions on the influence of perceived behavioural control, infrastructure and compatibility on the use of new media in scholarly communication.

### **3.12.2 Measurement of Moderating Variables**

Moderating variables of the study were measured by establishing the effect of age, gender, attitude towards new media and anxiety on the relationship between the independent variables and the dependent variable (use of new media in scholarly communication). These personal factors were based on the UTAUT model which suggests that the effect of the four independent variables is moderated by age, gender, attitude and anxiety (Venkatesh, 2003).

### **3.12.3 Measurement of the Dependent Variable**

The dependent variable for this study was measured by establishing the extent to which lecturers used Web 2.0 technologies in scholarly communication activities like publishing journal papers, book chapters, publishing academic books and peer review of academic work. These Web 2.0 identified by Sawant (2012) include online documents, social networks, wikis, blogs, mini blogs and RSS feeds.

## **CHAPTER FOUR**

### **FINDINGS AND DISCUSSION**

#### **4.1 Introduction**

This chapter deals with organisation, analysis and presentation of the data collected from the respondents sampled for this study. This data was collected using a questionnaire which was designed to measure the hypotheses of the study. The chapter also presents the findings and results of the study. The purpose of this study was to establish the determinants of use of new media in scholarly communication by university lecturers in selected public universities in Kenya. The study used performance expectancy, effort expectancy, social influence, facilitating conditions and personal factors as independent variables and use of new media in scholarly communication as the dependent variable. Most of the questions were Likert-type scale questions ranging from 1-5 indicating the extent to which the respondents agreed or disagreed with each statement used to capture the different variables.

#### **4.2 Preliminary Analysis of Results**

This section presents findings on age, gender, university, rank, participation in scholarly communication, format of scholarly communication and trends of new media use in scholarly communication.

##### **4.2.1 Response Rate**

The population size for this study was 626 lecturers while the sample size was 152. The study recorded a response rate of 85.5%. Glasgow (2005) has argued that a response rate of 70% or higher is desirable because lower response rates call into question the representativeness of the sample. Fonsnacht (2013) and Bailey (1987) set an adequate response rate at 75%.

#### 4.2.2 Age and Gender of Respondents

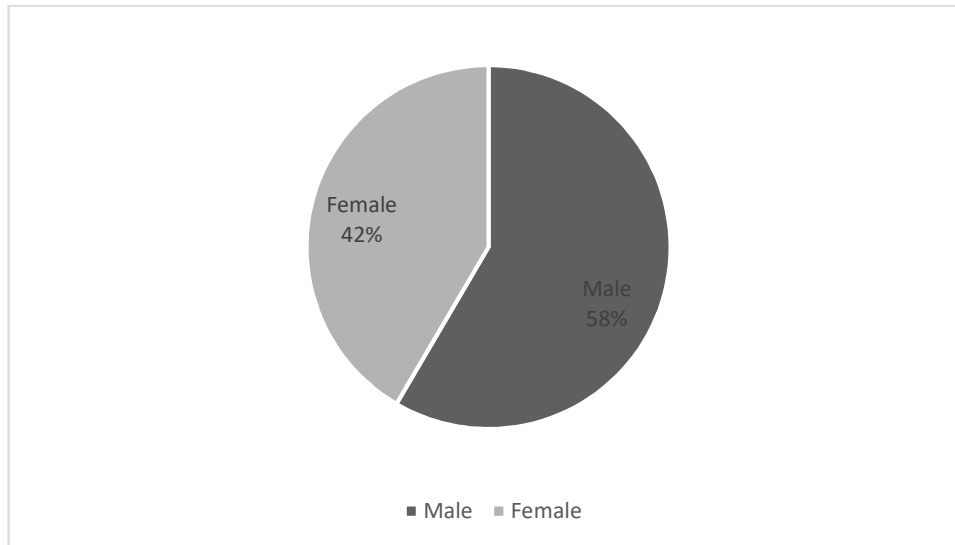
The study sought to find out the age distribution of the respondents. This was important because according to Venkatesh *et al.* (2003), age and gender are among the factors which moderate the relationship between key constructs like social influence, performance expectancy, effort expectancy and behavioural intentions to accept and use new technologies.

Results indicate that 13 (10%) of the respondents were aged between 61-70 years, 40 (30.8%) of were aged 51-60 years, 37 (28.5%) were aged 41-50, 31 (23.8%) were between 31-40 while 9(6.9%) were under 30 years old as shown in Table 4.1 below. Majority of the respondents (76; 58.5%) were male while 54 (41.5%) were female as shown in Figure 4.1 below.

**Table 4.1: Percentage distribution of respondents by age**

Age	Number	Percentage
<30	9	6.9
31-40	31	23.8
41-50	37	28.5
51-60	40	30.8
61-70	13	10.0
<b>Total</b>	<b>130</b>	<b>100.0</b>

Source: Research Data



**Figure 4.1: Gender of respondents**

#### **4.2.3 University of Respondents and their Current Rank**

The respondents were drawn from the five universities as shown in Table 4.2 below. 50 respondents (38.5%) were from the University of Nairobi, 33 (25.4%) from Moi University, 21 (16.2%) from Kenyatta University, 17 (13.1%) from Egerton University while 9 (6.9%) were from JKUAT.

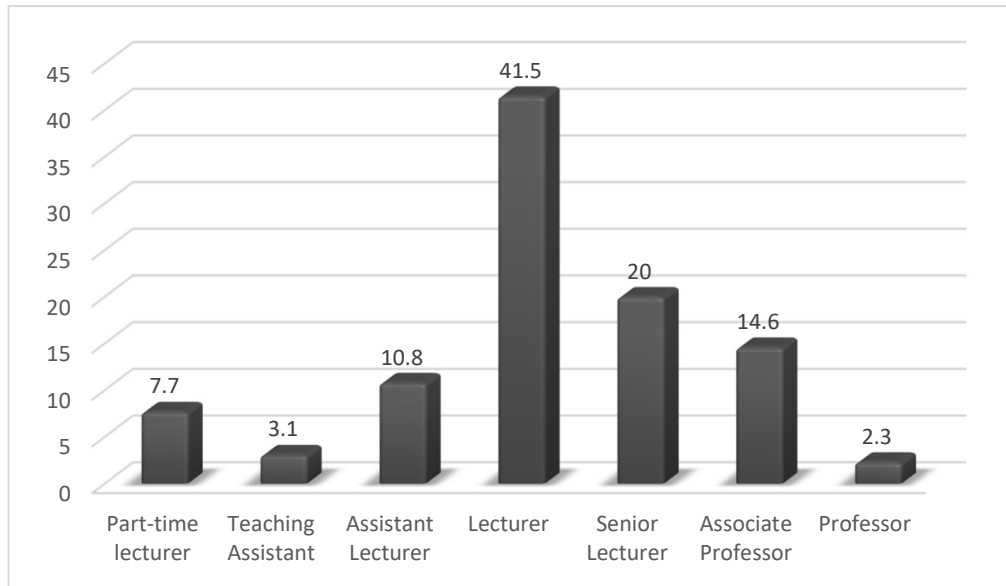
**Table 4.2: Percentage distribution of respondents according to their university**

University	Number	Percentage
University of Nairobi	50	38.5
Egerton University	17	13.1
Kenyatta University	21	16.2
Moi University	33	25.4
JKUAT	9	6.9
<b>Total</b>	<b>130</b>	<b>100.0</b>

Source: Research Data

Of the 130 respondents, 10 (7.7%) were part-time lecturers, 4 (3.1%) were teaching assistants, 14 (10.8%) were assistant lecturers, 54 (41.5%) were lecturers, 26 (20%) were

senior lecturers, 19 (14.6%) were associate professors while 3 (2.3%) were full professors. This is summarised in Figure 4.2 below.



**Figure 4.2: Percentage distribution of respondents according to rank**

Findings indicate that 3.1 % of the respondents had an undergraduate degree as the highest qualification while 49.2% had a master's degree, 41.5% had a PhD and 6.2% had post-doctoral qualifications as shown in Table 4.3 below.

**Table 4.3: Highest level of education attained by respondents**

Level of education	Frequency	Percent
Undergraduate	4	3.1
Masters	64	49.2
PhD	54	41.5
Post-Doctorate	8	6.2
<b>Total</b>	<b>130</b>	<b>100.0</b>

Source: Research Data

#### **4.2.4 Participation in Scholarly Communication**

Respondents were asked to indicate whether they had participated in any of the various forms of scholarly communication between 2011 and 2016. Results indicate that 53.1% of the respondents had published at most two journal papers during the period, 27.7% had published between 3-5 journal papers, 5.4% had published 6-9 papers while only 1.5% of the respondents had published more than 10 journal papers. This means that 87.7% of the respondents reported having participated in publishing journal papers during the period. As shown in Table 4.4, 90.8% of the respondents reported to have presented at least one conference paper during the period under review. Of these, 42.3% had presented at most two conference papers, 26.9% had presented 3-5 papers, 13.8% had presented 6-9 papers while 7.7% had presented more than 10 papers. This implies that conference presentation and publication of journal papers were the most popular forms of scholarly communication in which the respondents engaged. This agrees with INASP (2013), and UNESCO Science Report (2015) both of which show a high tendency by Kenyan researchers to engage more in presentation of conference papers and publication of journal papers especially in the bio-sciences.

Publishing of books, serving as a journal editor and publishing of book chapters were the least popular forms of scholarly communication with 82.3%, 76.2% and 58.5% of the respondents respectively never having engaged in any of these forms of scholarly communication during the period. It was also established that 65.4% of the respondents had served as peer reviewers during the period.

**Table 4.4: Forms of scholarly communication respondents had participated in**

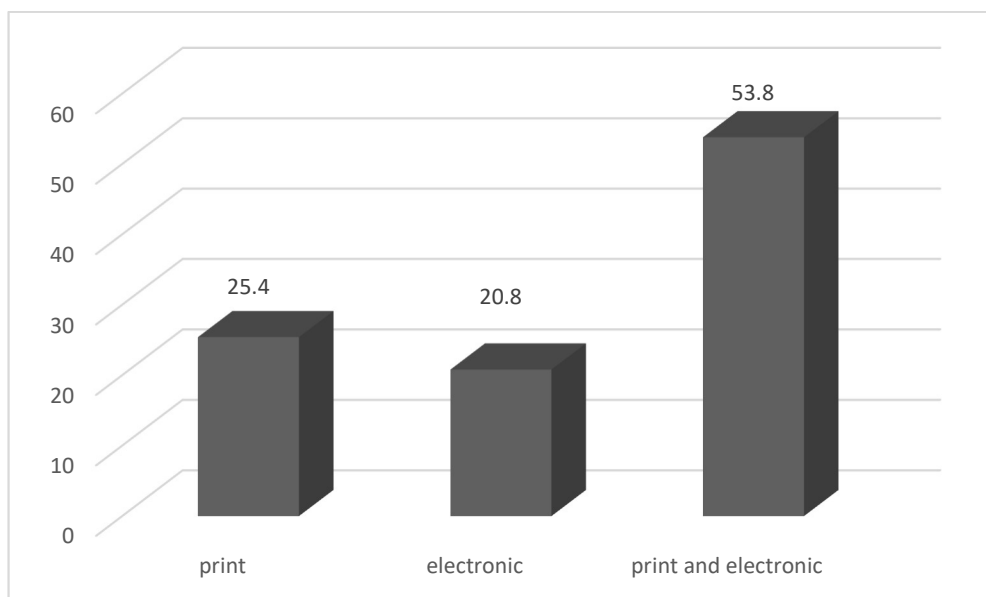
Activity	Number of publications (2011-2016) -					Total
	%					
	0	1-2	3-5	6-9	>10	100
Publication of journal paper	12.3	53.1	27.7	5.4	1.5	100
Published book	82.3	16.2	1.5	0	0	100
Published book chapter	58.5	27.7	11.5	2.3	0	100
Presented conference paper	9.2	42.3	26.9	13.8	7.7	100
Served as journal editor	76.2	21.5	2.3	0	0	100
Served as peer review	34.6	22.3	10.8	16.2	16.2	100

Source: Research Data

Figure 4.3 shows that 54.3% of these publications were a hybrid of print and electronic formats whereas 24.8% were print only versions and 20.9% were electronic only versions. This agrees with Anderson-Wilk and Hino, (2011) who argue that many university faculty are under pressure to move away from focusing solely on print publications, and begin to use new media in their education and outreach efforts. As a result, publishing online is on the rise among many university teaching staff. One area of scholarly communication where there has been a tremendous influence of new media is the journal where electronic journals have been on the rise. The arrival of the web saw the proliferation of e-journals in all disciplines, and these found widespread, enthusiastic acceptance by end users (Mukherjee (2009).

Though the needs of diverse audiences continue to evolve in terms of the quality and quantity of scholarly publications demanded, scholarly publishing has been slow to address these needs by taking advantage of the many engaging opportunities available through new media, including publishing online. In this respect, a number of communication channels are being employed by universities and research institutions across the globe to promote the use of new media tools in communicating research

findings. As the key stakeholders, researchers and scholars are at the heart of change and they need to become much more central to shaping the change process. Change in scholarly communication has been under way long enough that it is clear it will not achieve its full potential without active involvement of scholars and researchers, and research institutions and universities are the obvious places to begin a much deeper level of exploration of and dialogue about the evolving spectrum of issues (Hahn, 2008).



**Figure 4.3: Format of publication**

#### **4.2.5 New media tools preferred for scholarly communication**

Respondents were presented with eight new media technologies (Gu and Widen-Wulff, 2010) to rate the extent to which they used them in their scholarly communication activities. They rated the tools on a five-point likert scale ranging from 1 to 5 (where, 1 = never, 2 = less frequent, 3 = fairly frequent, 4 = frequent and 5 = very frequent). The higher the score, the higher was the frequency of use in scholarly communication activities, and vice versa. Table 4.5 depicts the distribution of their responses. From the findings, online publishing was the most preferred tool for scholarly communication by respondents with 59.2% reporting using it very frequently and 8.5% using it fairly



frequently. A further 39.2% also reported using multimedia sharing very frequently while 27.7% were using social networks very frequently. On the flipside, RSS reported the least usage with only 13.8% of the responds reporting frequent use in scholarly communication. Other new media tools that had the least usage in scholarly communication include wikis (16.2%), Tagging (16.9%) and miniblogs (23.8%) as shown in Table 4.5.

**Table 4.5: Frequency of use of new media tools in scholarly communication**

Tools	Response (%)					Means	Std. Dev
	Never	Less frequent	Fairly frequent	Frequent	Very frequent		
Online publishing	4.6	6.9	20.8	8.5	59.2	4.11	1.22
Multimedia sharing	13.8	12.3	23.8	10.8	39.2	3.49	1.459
Social networks	21.5	20.0	20.8	10.0	27.7	3.02	1.512
Blogs	25.4	20.0	18.5	10.8	25.4	2.91	1.532
Miniblogs	26.2	19.2	18.5	12.3	23.8	2.88	1.525
Wikis	27.7	26.2	16.9	13.1	16.2	2.64	1.425
Tagging	30.0	25.4	16.2	11.5	16.9	2.60	1.450
Rich site summary	35.4	26.2	14.6	10.0	13.8	2.41	1.413

N = 130

Source: Research Data

From the findings, online publishing was the most preferred tool for scholarly communication by respondents with a mean of 4.11. Multimedia sharing had a mean of 3.49, social networks 3.02, blogs 2.91, miniblogs, 2.88, wikis 2.64, Tagging 2.60 while RSS had the lowest usage with a mean of 2.41 as shown in Table 4.5.

This finding differs to some extent from the findings of a study in Finland by Gu and Widen-Wulff (2010) on the influence of social media on scholarly communication. It was aimed at providing an overview of researchers' use of Web 2.0 techniques so as to discuss

a possible change of information behaviours in the context of scholarly communication. The study found that Web 2.0 tools were used to a great extent by researchers, especially blogs (85.7%), wikis (92%), social networks (91.3%), multi-media sharing (92.9%), and online documents (91.3%). In the present study, only online publishing and multimedia sharing seem to compare favourably with over 50% of the respondents reporting using the two frequently. However, the findings tend to agree with a study conducted by Madhusudhan (2012) on how research scholars at the University of Delhi integrated social networks sites (SNS) into their daily communication research work. The study reported that most scholars use SNS as an interactive platform rather than for academic communication. The results of the study indicated that scholars used SNS for networking, uploading photos, searching for jobs and interacting with friends. SNSs were least used for sharing of research work by the scholars. These results indicate that there is little use of SNS for scholarly communication.

The responses to each media tool were scored on a scale of 1, indicating no use, to 5, indicating highest frequency of use. The individual statement scores were summed up to form a frequency of use index score for each respondent (reliability coefficient,  $\alpha = 0.927$ ). The index score varied between 8, indicating the least frequency of use of new media, and 40, indicating the highest frequency of use of new media in scholarly communication. The higher the score, the higher was the level of frequency of use of new media in scholarly communication, and vice versa. The index score which had a mean score of 24.06 and Std dev. of 9.414 was later collapsed into three ordinal categories in order to differentiate between the levels of frequency of use of new media in scholarly communication among the sampled respondents (Kothari, 1990, Edwards & Kenney, 1946). This included a score of 8-18 (low frequency), 19-29 (average frequency) and 30-40 (high frequency). Table 4.6 summarizes the levels of frequency of use of new media in scholarly communication.

**Table 4.6: Levels of frequency of use of new media in scholarly communication**

<i>Levels of frequency</i>	<i>Frequency</i>	<i>Percent</i>
Low	47	36.2
Average	40	30.8
High	43	33.1
<b>Total</b>	<b>130</b>	<b>100.0</b>

Source: Research Data

Table 4.6 indicates that 36.2 % of the respondents recorded a low frequency of use, 30.8% recorded an average use while 33.1% recorded a high usage of new media in their scholarly communication. Cumulatively, therefore, 63.9% of the respondents recorded an average to high level of frequency of use of new media in scholarly communication. This suggests that university academic staff in Kenya's public universities were increasingly embracing new media technologies in their scholarly communication. This could be attributed to the fact that academic staff in Kenya are beginning to realise that new media makes it easy to publish scholarly work by providing an easier avenue that is able to navigate the traditional barriers to publishing. New media also opens up new unlimited avenues for scholarly communication which would have otherwise been limited by traditional print media (Meadows, 2003). From the literature discussed earlier, it emerged that scholarly communication in Kenya faces major challenges, some of which have been identified by a number of authors (Chakava, 2007; Ochola and Ochola, 2007; Darko-Ampem, 2003; Ilieva and Chakava, 2016). These challenges include severe economic conditions which lead to high costs of publishing, poorly established distribution outlets for scholarly publications, low levels of literacy, lack of a clear policy regarding the development of the industry, low structure and size of the publishing industry, and the poor positioning of the academic system in Kenya. These challenges are believed to still contribute to the slow uptake of new media in scholarly publishing in Kenya.

### **4.3 Descriptive Statistics**

The study was guided by performance expectancy, effort expectancy, social influence, facilitating conditions as independent variables while personal factors represent the moderating variable.

#### **4.3.1 Influence of Performance Expectancy on Use of New Media in Scholarly Communication**

The first objective of this study sought to determine whether performance expectancy of new media technologies influences their use in scholarly communication by academic staff in Kenya's public universities. This objective was informed by the UTAUT model which found performance expectancy to be a key construct influencing acceptance and use of technology.

In this study, performance expectancy was assessed from a series of 5 statements seeking respondent's agreement or disagreement with its various dimensions. These five statements were based on the original UTAUT model of Venkatesh et al (2003) (Appendix III) but with some modifications to suit the academic nature of the current study. Responses to these statements were measured on a five-point likert scale ranging from 1 to 5 (where, 1= strongly disagree, 2 = disagree, 3 = not sure, 4 = agree and 5 = strongly agree). The higher the score the higher was the influence of performance expectancy on scholarly communication, and vice versa. Table 4.7 shows the distribution of the responses on the statements.

**Table 4.7:** Performance expectancy of new media on scholarly communication

Items	Response (%)					Means	Std. Dev
	SD	D	NS	A	SA		
Using new media increases my scholarly communication productivity	9.2	15.4	17.7	46.9	10.8	3.35	1.146
I find new media useful in my scholarly communication	13.1	12.3	15.4	46.2	13.1	3.34	1.236
Using new media enables me to publish more scholarly work than would otherwise be possible	10.0	14.6	19.2	43.8	12.3	3.34	1.172
Using new media enables me to accomplish my scholarly communication more quickly	10.8	14.6	16.2	47.7	10.8	3.33	1.177
Using new media improves the quality of my scholarly communication	10.0	15.4	19.2	43.8	11.5	3.32	1.168

N = 130

Source: Research Data

Performance expectancy refers to the degree to which an individual believes that using the system will help him or her to attain gains in job performance (Venkatesh, et al 2003). The responses to each constituent dimension of performance expectancy were scored on a scale of 1, indicating least level of influence of performance expectancy in scholarly communication, to 5, indicating highest level of influence of performance expectancy in scholarly communication. Generally, respondents agreed with each of these statements with some degree based on the mean scores. The constructs were scored as follows: Using new media increases my scholarly communication productivity (mean: 3.35), I find new media useful in my scholarly (mean: 3.34), Using new media enables me to publish more scholarly work than would otherwise be possible (mean: 3.34), Using new media enables me to accomplish my scholarly communication more quickly (mean 3.33), and sing new media improves the quality of my scholarly communication (mean 3.32).

Some constructs were however rated lower than others. For instance, respondents rated the construct ‘using new media in scholarly communication improves the quality of my scholarly communication work’ lowest of all the constructs (mean, 3.32). This could be attributed to the fact that some scholars fear that new media often admits work which would otherwise not pass for scholarly work especially through self-publishing approaches. According to Bgoya, (2007) and Horowitz & Curtis (1995), to qualify as scholarly, a publication must have three qualities simultaneously: it was written by a scholar (primarily for other scholars), that it was peer reviewed by an acknowledged authority in the area covered, and that it covers a recognisable area within a continuing scholarly debate or inquiry about a subject. Quality peer review remains a huge challenge in online publishing.

The individual statement scores were further summed up to form a performance expectancy index score for each respondent (reliability coefficient,  $\alpha = 0.986$ ). The index score varied between 5, indicating the least level of performance expectancy, and 25, indicating the highest level of performance expectancy of new media in scholarly communication. The higher the score, the higher was the level of performance expectancy of new media in scholarly communication, and vice versa<sup>1</sup>. The index score which had a mean score of 16.67 and Std dev. of 5.378 was later collapsed into three ordinal categories in order to differentiate between the levels of performance expectancy of new media in scholarly communication among the sampled respondents (Kothari, 1990, Edwards & Kenney, 1946). This included a score of 5-11 (low performance expectancy), 12-18 (average performance expectancy) and 19-25 (high performance expectancy). Table 4.8

---

<sup>1</sup>  $5 \times 1 = 5$                       (The least level of performance expectancy)  
 $5 \times 3 = 15$                       (Average level of performance expectancy)  
 $5 \times 5 = 25$                       (The highest level of performance expectancy)

summarizes the levels of performance expectancy of new media in scholarly communication.

**Table 4.8: Levels of performance expectancy**

<i>Levels of performance expectancy</i>	<i>Frequency</i>	<i>Percent</i>
Low	32	24.6
Average	25	19.2
High	73	56.2
<b>Total</b>	<b>130</b>	<b>100.0</b>

Table 4.8 indicates that 56.2 % of the respondents recorded a high level of influence of performance expectancy of new media in scholarly communication, 19.2% recorded an average performance expectancy score while 24.6% recorded a low score of performance expectancy. Performance expectancy refers to the degree to which an individual believes that using the system will help him or her to attain gains in job performance hence this result indicates that majority of the respondents believe that using new media will help them achieve better gains in their scholarly communication activities.

Scores of performance expectancy were correlated with those of level of usage of new media in scholarly communication as shown in Table 4.9. Results indicate that respondents who recorded a low level of performance expectancy also reported low usage (71.9%) of new media in scholarly communication (p value 0.000). On the other hand, respondents who recorded a high level of performance expectancy also tended to report a high frequency of usage (49.3%) of new media in their scholarly communication ( $p < 0.05$ ). This suggests the existence of a significant relationship between performance expectancy and the use of new media in scholarly communication by university academic staff.

This shows that performance expectancy of new media technologies was a key determinant of use of new media in scholarly communication by academic staff in the sampled public universities. This agrees with Akbar (2013) who found that performance expectancy had a significant influence on technology acceptance and that its effect was moderated by gender and age. Akbar's study sought to conduct empirical research testing the factors that influenced student's acceptance and use of technology in their academic environment. Another study by Tung and Chang (2008) found that when learners perceive e-learning as useful, they were more likely to accept and actually learn online. They also found that educators were likely to use e-learning since they found it easy to use in terms of greater control over their work, improved job performance, time saving, accomplishing tasks more quickly and enhancing effectiveness.

**Table 4.9: Relationship between performance expectancy and frequency of use of new media**

level of performance expectancy	Level of frequency of use			Total	Number
	low	average	high		
Low	71.9%	12.5%	15.6%	100.0%	32
Average	48.0%	44.0%	8.0%	100.0%	25
High	16.4%	34.2%	49.3%	100.0%	73
<b>Total</b>	<b>36.2%</b>	<b>30.8%</b>	<b>33.1%</b>	<b>100.0%</b>	<b>130</b>

**Pearson Chi-Square Value: 38.812; df 4; p-value 0.000**

#### **4.3.2 Influence of Effort Expectancy on Use of New Media in Scholarly Communication**

The second objective sought to establish whether effort expectancy associated with new media technologies influences their use in scholarly communication by university academic staff in public universities in Kenya. This objective was informed by UTAUT model which defines effort expectancy as the degree of ease associated with the use of the system or the degree to which a person believes that using a particular system would be



free from effort (Davis, 1998; Venkatesh et al, 2003). The study sought to establish the degree to which academic staff found using new media in their scholarly communication tasks to be effortless.

**Table 4.10: Effort expectancy and use of new media in scholarly communication**

<b>Tools</b>	<b>Response (%)</b>					<b>Means</b>	<b>Std. Dev</b>
	<b>SD</b>	<b>D</b>	<b>NS</b>	<b>A</b>	<b>SA</b>		
My interaction with new media in my scholarly communication work is clear and understandable	18.5	13.8	34.6	26.9	6.2	2.88	1.179
It has been easy for me to become skilful in using new media in my scholarly communication	16.9	16.9	26.9	31.5	7.7	2.96	1.216
Learning to use new media in scholarly communication was easy for me	17.7	16.9	23.8	33.1	8.5	2.98	1.248
Overall, I find new media easy to use in my scholarly communication	16.9	14.6	21.5	33.8	13.1	3.12	1.298

**N = 130**

Source: Research Data

In this study, effort expectancy of new media in scholarly communication was assessed from a series of five statements seeking respondent's agreement or disagreement with its various dimensions. These were based on the original UTAUT model but with minor adaptations to remain relevant to the current study. Responses to these statements were measured on a five-point likert scale ranging from 1 to 5 (where, 1= strongly disagree, 2 = disagree, 3 = not sure, 4 = agree and 5 = strongly agree). The higher the score the higher was the influence of effort expectancy on scholarly communication, and vice versa.

As shown in Table 4.10, results indicate that most of the responses tended to lie between not sure (NS) and agree (A). Most of the respondents responded as follows: Overall, I find new media easy to use in my scholarly communication (mean, 3.12,), Learning to use new media in scholarly communication was easy for me (mean, 2.98), It has been easy for me to become skilful in using new media in my scholarly communication (mean, 2.96), and My interaction with new media in my scholarly communication work is clear and understandable (mean, 2.88).

The responses to each constituent dimension of effort expectancy were scored on a scale of 1, indicating least level of influence of effort expectancy in scholarly communication, to 5, indicating highest level of influence of effort expectancy in scholarly communication. The individual statement scores were summed up to form an effort expectancy index score for each respondent (reliability coefficient,  $\alpha = 0.977$ ). The index score varied between 4, indicating the least level of effort expectancy, and 20, indicating the highest level of effort expectancy of new media in scholarly communication. The higher the score, the higher was the level of effort expectancy of new media in scholarly communication, and vice versa<sup>2</sup>. The index score had a mean score of 11.94 and Std dev. of 4.780 and was later collapsed into three ordinal categories in order to differentiate between the levels of effort expectancy of new media in scholarly communication among the sampled respondents. This included a score of 4-9 (low effort expectancy), 10-14 (average effort expectancy) and 15-20 (high effort expectancy). Table 4.11 indicates that 39.2 % of the respondents recorded a high level of effort expectancy of new media in scholarly communication,

---

<sup>2</sup>  $4 \times 1 = 4$                       (The least level of effort expectancy)  
 $4 \times 3 = 12$                       (Average level of effort expectancy)  
 $4 \times 5 = 20$                       (The highest level of effort expectancy)

28.5% reported an average level of effort expectancy while 32.3% recorded a low level of effort expectancy.

**Table 4.11: Levels of effort expectancy**

<i>Levels of effort expectancy</i>	<i>Frequency</i>	<i>Percent</i>
Low	42	32.3
Average	37	28.5
High	51	39.2
<b>Total</b>	<b>130</b>	<b>100.0</b>

**N=130**

Source: Research Data

Scores of effort expectancy were correlated with those of frequency of use of new media in scholarly communication to establish the extent to which effort expectancy influenced the use of new media in scholarly communication. Effort expectancy is the extent to which a person believes that using a new system is effortless (Venkatesh, 2003). As shown in Table 4.12, results indicate that respondents who recorded a low level of effort expectancy also reported a low frequency of use of new media in scholarly communication (61.9%,  $p$  value 0.000). On the other hand, respondents who recorded a high level of effort expectancy also reported a high frequency of use (56.9%) of new media in scholarly communication ( $p < 0.05$ ). This indicates the presence of a significant relationship between effort expectancy and use of new media in scholarly communication.

**Table 4.12: Relationship between effort expectancy and frequency of use of new media**

Level of effort expectancy	Level of frequency of use				Number
	Low	Average	High	Total	
Low	61.9	21.4	16.7	100.00%	42
Average	43.2	37.8	18.9	100.00%	37
High	9.8	33.3	56.9	100.00%	51
Total	36.2	30.8	33.1	100.00%	130

Pearson Chi-Square Value: 34.298; df 4; P-value 0.000

Source: Research Data

#### **4.3.3 Effect of Social Influence on Use of New Media in Scholarly Communication**

The third objective sought to assess the extent to which social influence impacts on the use of new media technologies in scholarly communication by university academic staff in Kenya. Social influence is defined as ‘the degree to which an individual perceives that important others believe he or she should use a new technology’ (Venkatesh *et al.* 2003). The main constructs of social influence include subjective norms, social factors, and image. The objective sought to outline the role played by peers within academia towards influencing academic staff to use new media technologies in their scholarly communication.

Respondents in this study, were asked whether the people who are important to them expected them to use new media technologies in scholarly communication. In addition, respondents were asked whether their universities expected that they use new media in their scholarly communication tasks. Image comes from the innovation diffusion theory and is defined as ‘the degree to which use of an innovation is perceived to enhance one's image or status in one's social setting (Venkatesh *et al.* 2003).

In this study, social influence towards adoption of new media was assessed from a series of four statements seeking respondent's agreement or disagreement with its various dimensions. These were based on the original UTAUT model with minor modifications to suit the study. Responses to these statements were measured on a five-point likert scale ranging from 1 to 5 (where, 1= strongly disagree, 2 = disagree, 3 = not sure, 4 = agree and 5 = strongly agree). The higher the score the higher was the impact of social influence on the use of new media, and vice versa. Table 4.13 shows the distribution of their responses on the statements.

**Table 4.13: Effect of social influence on use of new media in scholarly communication**

Tools	Response (%)					Means	Std. Dev
	SD	D	NS	A	SA		
In general, my university expects that I should use new media in my scholarly communication tasks	10.0	10.8	32.3	33.8	13.1	3.29	1.137
My colleagues using new media in scholarly communication have liked it	13.8	16.9	40.0	22.3	6.9	2.92	1.107
My colleagues think that I should use new media in my scholarly communication work	18.5	23.8	26.2	22.3	9.2	2.80	1.241
People who are important to me think that I should use new media in my scholarly communication work	17.7	23.8	28.5	22.3	7.7	2.78	1.201

N = 130

Source: Research Data

The construct 'in general, my university expects that I should use new media in my scholarly communication tasks' scored highest (Mean: 3.29). On the other hand, the

construct ‘People who are important to me think that I should use new media in my scholarly communication work’ scored lowest (Mean: 2.78) as shown in Table 4.13. This implies the university environment commanded the highest level of social influence on the use of new media technologies by academic staff as opposed to personal networks like family and friends. Findings by Anderson-Wilk and Hino (2011) have found a similar pattern and argued that scholarly communication often serves two major interests – the interests of audiences of scholarly communication and those of authors of the publications in obtaining the peer review publication necessary for their tenure and promotion.

The responses to each constituent dimension of social influence towards adoption of new media in scholarly communication were scored on a scale of 1, indicating least level of social influence on scholarly communication, to 5, indicating highest level of social influence on scholarly communication. The individual statement scores were summed up to form a social influence index score for each respondent (reliability coefficient,  $\alpha = 0.949$ ). The index score varied between 4, indicating the least level of social influence, and 20, indicating the highest level of social influence of new media in scholarly communication. The higher the score, the higher was the level of social influence of new media in scholarly communication, and vice versa<sup>3</sup>. The index score had a mean score of 11.79 and Std dev. of 4.370 and was later collapsed into three ordinal categories in order to differentiate between the levels of social influence of new media in scholarly communication among the sampled respondents. This included a score of 4-9 (low social influence), 8-13 (average social influence) and 14-20 (high social influence). Table 4.14 indicates that 36.9% of the respondents recorded a low level of social influence of use of

---

<sup>3</sup>  $4 \times 1 = 4$  (The least level of social influence)

$4 \times 3 = 12$  (Average level of social influence)

$4 \times 5 = 20$  (The highest level of social influence)

new media in scholarly communication, 31.5% recorded average influence while a further 31.5% recorded high influence.

**Table 4.14: Levels of social influence**

<i>Levels of social influence</i>	<i>Frequency</i>	<i>Percentage</i>
Low	48	36.9
Average	41	31.5
High	41	31.5
<b>Total</b>	<b>130</b>	<b>100.0</b>

Source: Research Data

Scores of social influence were compared with those of frequency of use of new media in scholarly communication to ascertain whether there was any significant relationship between the two variables. Social influence is defined as ‘the degree to which an individual perceives that important others believe he or she should use a new technology’ (Venkatesh *et al.* 2003). As shown in Table 4.15, results reveal that respondents who scored low on social influence also tended to score low on frequency of use (52.1%) of new media in scholarly communication. Similarly, respondents who scored high on social influence also tended to score high on frequency of use (51.2%). However, results suggest that there was no significant relationship between social influence and use of new media in scholarly communication ( $p > 0.05$ ). Social influence, thus, was not a significant determinant of use of new media in scholarly communication by university academic staff in public universities in Kenya.

**Table 4.15: Relationship between social influence and use of new media tools**

Level of social influence	Level of frequency of use			Total	Number
	Low	Average	High		
Low	52.1%	29.2%	18.8%	100.0%	48
Average	34.1%	34.1%	31.7%	100.0%	41
High	19.5%	29.3%	51.2%	100.0%	41
Total	36.2%	30.8%	33.1%	100.0%	130

Pearson Chi-Square Value 13.859; df 4; P-value 0.008

This finding seems to disagree with Anderson-Wilk and Hino, (2011) who noted that many university faculty are under pressure to move away from focusing solely on print publications, and begin to use new media in their education and outreach efforts to meet requirements for tenure and promotion. Such pressure, it would appear, comes mostly from their scholarly peers and university administrators. A number of communication channels are being employed by universities and research institutions across the globe to promote the use of new media tools in communicating research findings. This finding also disagrees with other studies which have found a strong support for the relationship between social influence and behavioural intention to use technology (Kleijnen et al 2004, Hung et al 2002). Kleijnen et al (2004) reported that social influence had a significant influence on people's intention to use wireless finance. Chang and Cheung (2001) also found that social influence was significant to intention to use the internet at the workplace.

#### **4.3.4 The Influence of Facilitating Conditions on Use of New Media in Scholarly Communication**

The fourth objective sought to evaluate how facilitating conditions influence the decision to use new media technologies in scholarly communication by university academic staff in Kenya. Facilitating conditions refer to the degree to which an individual believes that an organisational and technical infrastructure exists to support the use of new technology'



(Venkatesh *et al.* 2003). The key constructs are (1) perceived behavioural control, (2) facilitating conditions, and (3) compatibility.

In this study, influence of facilitating conditions on the decision to use new media was assessed from a series of seven statements seeking respondent's agreement or disagreement with its various dimensions. These were based on the original UTAUT model with some modifications to suit this study. Responses to these statements were measured on a five-point likert scale ranging from 1 to 5 (where, 1= strongly disagree, 2 = disagree, 3 = not sure, 4 = agree and 5 = strongly agree). The higher the score the higher was the influence of facilitating conditions on the use of new media technologies in scholarly communication, and vice versa. Table 4.16 shows the distribution of their responses on the statements.

**Table 4.16: Effect of facilitating conditions on use of new media in scholarly communication**

Tools	Response (%)					Means	Std. Dev
	SD	D	NS	A	SA		
My university has enough computers to support the use of new media in scholarly communication	32.3	23.8	20.8	16.2	6.9	2.42	1.281
My university has installed sufficient internet bandwidth to support scholarly communication	22.3	20.8	23.8	21.5	11.5	2.79	1.322
There are adequate trained technical staff who support us in using new media in scholarly communication	30.8	19.2	33.1	12.3	4.6	2.41	1.179
Faculties are sufficiently trained on using new medial in scholarly communication	33.8	23.8	28.5	10.0	3.8	2.26	1.145
The cost of acquiring new media communication technologies for use in scholarly community is too high	2.3	5.4	27.7	36.9	27.7	2.18	0.979
I have the financial resources to purchase new media technologies for my scholarly communication	41.5	29.2	20.8	6.2	2.3	1.98	1.042
Overall, I believe I have enough resources to support my use of new media in may scholarly communication	34.6	30.0	23.1	8.5	3.8	2.17	1.115

N = 130

Source: Research Data

Respondents generally scored the constructs of facilitating conditions lowly. The mean score for adequacy of computers was 2.42, training of Faculty scored 2.26, sufficiency of internet bandwidth scored 2.79, trained technical staff scored 2.41 while availability of financial resources scored 1.98. This indicates that most respondents did not consider the new media technologies and resources set aside by their universities adequate for their use in scholarly communication.

The responses to each constituent dimension of the influence of facilitating conditions on the use of new media technologies in scholarly communication were scored on a scale of 1, indicating least level of influence of facilitating conditions, to 5, indicating highest level of influence of facilitating conditions on the use of new media in scholarly communication. The individual statement scores were summed up to form a facilitating conditions index score for each respondent (reliability coefficient,  $\alpha = 0.840$ ). The index score varied between 7, indicating the least level of influence of facilitating conditions, and 35, indicating the highest level of influence of facilitating conditions of new media in scholarly communication. The higher the score, the higher was the level of influence of facilitating conditions of new media in scholarly communication, and vice versa<sup>4</sup>. The index score had a mean score of 16.21 and Std dev. of 5.785 and was later collapsed into three ordinal categories in order to differentiate between the levels of influence of facilitating conditions of new media in scholarly communication among the sampled respondents. This included a score of 7-16 (low influence of facilitating conditions), 17-25 (average influence of facilitating conditions) and 26-35 (high influence of facilitating conditions).

---

<sup>4</sup>  $7 \times 1 = 7$  (The least level of influence of facilitating conditions)

$7 \times 3 = 21$  (Average level of influence of facilitating conditions)

$7 \times 5 = 35$  (The highest level of influence of facilitating conditions)

Table 4.17 indicates that 56.9% of the respondents recorded a low level of influence of facilitating conditions of new media in scholarly communication, 46% recorded an average level of influence while only 10% recorded a high level of influence of facilitating conditions. This suggests that most of the respondents did not believe that an organisational and technical infrastructure existed within their universities to support their use of new media technology in scholarly communication.

**Table 4.17: Levels of influence of facilitating conditions**

<i>Levels of influence of facilitating conditions</i>	<i>Frequency</i>	<i>Percent</i>
Low	74	56.9
Average	46	35.4
High	10	7.7
<b>Total</b>	<b>130</b>	<b>100.0</b>

Scores of level of influence of facilitating conditions were compared with those of frequency of use of new media in scholarly communication to ascertain whether there was any significant relationship between the two variables. As shown in Table 4.18, findings indicate that respondents who scored low on facilitating conditions tended to score low on use of new media in scholarly communication (41.9%) whereas those who scored high on facilitating conditions also tended to score high (60%) on use of new media in scholarly communication. However, findings show that there was no significant relationship between the two variables ( $p > 0.005$ ) hence suggesting that facilitating conditions were not a key determinant of use of new media in scholarly communication.

**Table 4.18: Relationship between facilitating conditions and frequency of use of new media in scholarly communication**

level of influence of facilitating conditions	Level of frequency of use			Total	
	low	average	high		Number
low	41.9%	31.1%	27.0%	100.0%	74
average	32.6%	30.4%	37.0%	100.0%	46
high	10.0%	30.0%	60.0%	100.0%	10
Total	36.2%	30.8%	33.1%	100.0%	130

Pearson Chi-Square Value 5.951; df 4; P-value 0.203

Source: Research Data

These facilitating conditions include internet bandwidth, computers, training and technical staff to assist in usage of new media technologies. Similar views have been recorded by Ngobeni (2010) who observes that African scholarly communication still continues to suffer from low or lack of government funding. African governments significantly cut funding to university libraries leading to book famine and poor technology installation which meant that scholars could not easily access up-to-date journals and books – hence they could not produce quality research papers. In the foregoing, the concomitant and index of scholarly research declined in terms of output, quality and regularity of publications due to a decline in funding for education (Mlambo, 2007). This limited funding has also affected new media facilities like internet connectivity, provision of computers and training.

#### **4.4 Influence of Personal Factors on Use of New Media in Scholarly Communication**

The fifth objective sought to assess the moderating influence of personal factors on the use of new media technologies in scholarly communication by university academic staff. This objective was informed by the UTAUT model which suggests that the effect of the four key constructs identified in objectives 1-4 is moderated by four other variables: age,

gender, experience and attitude towards use. The UTAUT model also suggests that these variables moderate the relationship between social influence and behavioural intentions (Venkatesh, 2003). In this study, several personal factors measured at different levels or scales of measurement and believed to influence the use of new media were used. These factors include age, gender, academic rank in the university, attitude and anxiety. Because of different levels of measurement of these variables, different statistical techniques were used to ascertain their influence on use of new media in scholarly communication.

#### ***4.4.1 Relationship between Age and Use of New Media in Scholarly Communication***

Analysis of Variance (ANOVA) was used to test whether there was any significant difference in the frequency of use of new media across the age categories of the respondents. ANOVA is used to determine the differences in means between one or more samples by examining the amount of variance within each of the samples, relative to the amount of variance between the samples. For ANOVA to be used, the test variable, that is, frequency of use index score, in this case, was an interval/ratio variable (measured in the actual scores), while the grouping variable, that is, age categories was a categorical variable. Tables 4.19 and 4.20 depict the results of the ANOVA test.

**Table 4.19: Descriptive statistics of use of new media index score in the four groups**

<b>Age categories</b>	<b>N</b>	<b>Mean</b>	<b>Minimum</b>	<b>Maximum</b>
<30	9	33.11	12	40
31-40	31	25.81	8	40
41-50	37	21.73	8	40
51-60	40	23.85	8	40
61-70	13	20.92	10	40
<b>Total</b>	<b>130</b>	<b>24.06</b>	<b>8</b>	<b>40</b>

Source: Research Data

Table 4.19 indicates that younger teaching staff members aged below 40 years had higher use of new media mean scores compared to the relatively older colleagues aged above 40

years. However, in order to find out whether the above difference in the use of new media mean scores among the age categories of the teaching staff was significant or not, ANOVA was used. Table 4.20 depicts ANOVA comparing use of new media mean scores among the five age categories of the teaching staff.

**Table 4.20: ANOVA comparing use of new media mean scores across age categories**

	Sum of Squares	Df	Mean Square	F	Significance
Between Groups	1162.460	4	290.615	3.537	.009
Within Groups	10271.048	125	82.168		
<b>Total</b>	<b>11433.508</b>	<b>129</b>			

Means significant at  $\alpha = 0.05$  significant level ( $p < 0.05$ )

Source: Research Data

Table 4.20 indicates that the difference in use of new media mean scores between age categories was statistically significant ( $p < 0.05$ ). The same results can be corroborated using Spearman's Rho Correlation coefficient as shown in Table 4.21 which shows that age had a negative correlation (-2.21) with use of new media in scholarly communication. This shows that increasing age was likely to reduce the use of new media in scholarly communication.

**Table 4.21: Spearman's Rho correlation coefficient**

<b>Correlations</b>				
			Age	level of frequency of use of new media
Spearman's rho	Age	Correlation Coefficient	1.000	-.221*
		Sig. (2-tailed)	.	.012
		N	130	130
	level of frequency of use of new media	Correlation Coefficient	-.221*	1.000
		Sig. (2-tailed)	.012	.
		N	130	130

\*. Correlation is significant at the 0.05 level (2-tailed).

Source: Research Data

The respondents' age was compared with their scores on use of new media in scholarly communication to ascertain whether there was any significant relationship between the two variables. As shown in Table 4.22, younger respondents aged below 30 scored very high (77.8%) in use of new media in scholarly communication as compared to respondents aged over 60 who scored low (61.5%) on use of new media in scholarly communication. Findings also show the presence of a significant relationship between age and the use of new media in scholarly communication ( $p < 0.05$ ).



**Table 4.22: Percentage distribution of respondents by frequency of use of new media in scholarly communication according to age**

Age	Level of Use			Total	Number
	low	average	high		
<30	11.1%	11.1%	77.8%	100.0%	9
31-40	32.3%	25.8%	41.9%	100.0%	31
41-50	35.1%	43.2%	21.6%	100.0%	37
51-60	37.5%	30.0%	32.5%	100.0%	40
61-70	61.5%	23.1%	15.4%	100.0%	13
<b>Total</b>	<b>36.2%</b>	<b>30.8%</b>	<b>33.1%</b>	<b>100.0%</b>	<b>130</b>

**Pearson Chi-Square Value 16.421; df 8; p-value 0.037**

This suggests that age of academic staff was a significant determinant of use of new media technologies in scholarly communication. A study by Marumbwa (2013) which sought to explore the moderating effects of socio-demographic variables on consumer acceptance and use of mobile money transfer services (MMTs) in southern Zimbabwe revealed that younger people were generally tech savvy and as such may therefore readily embrace new innovative technology products such as new media. A similar study by Basheer (2010) also revealed that younger lecturers adopted e-learning faster than their older colleagues. This observation also confirms Davis (1989)'s proposition that young consumers are highly technologically active in terms of their adoption, understanding, usage and perception of new tech products and applications.

#### **4.4.2 Relationship between Gender and Use of New Media in Scholarly Communication**

The study also sought to determine whether there was any significant difference in the use of new media across gender of the respondents. Independent sample t-test was used to determine if the use of new media mean scores between two unrelated samples (male and female teaching staff) differed significantly or not. For it to be used, the grouping variable:

gender of the teaching staff (male and female) was a nominal variable, while the test variable, that is, use of new media mean scores was an interval variable measured in the actual scores. Table 4.23 indicates that female teaching staff had a higher frequency of use mean score of 24.46 compared to that of 23.78 recorded by their male counterparts. However, the difference in scores between members of the two gender was not statistically significant ( $p > 0.05$ ).

**Table 4.23: Frequency of use mean scores across gender of teaching staff**

Gender	N	BAT post-test		<i>t-value</i>	<i>df</i>	<i>Sig. (2-tailed)</i>
		mean score	Std. Dev.			
Male	76	23.78	9.471	-.408	128	.684
Female	54	24.46	9.408			

Source: Research Data

To further confirm the findings presented above, frequency of use scores were transformed into a categorical variable (with low, average, and high use categories) and cross-tabulated with gender of the respondent, and Chi-square test was carried out to test for the hypothesised association. Results of these analyses are presented in Table 4.24. Results reveal that there was no significant difference in scores of use of new media in scholarly communication by gender. This indicates that there seems to be no significant relationship between gender and use of new media in scholarly communication ( $p > 0.05$ ). This suggests that the gender of the teaching staff did not significantly influence their frequency of use of new media in scholarly communication. Similar findings were reported by Marumbwa (2014) who found an insignificant relationship between gender and consumer acceptance and use of mobile money transfer services (MMTs) in Southern Zimbabwe.

**Table 4.24: Relationship between gender and use of new media in scholarly communication**

Gender	Level of Use			Total	Number
	low	average	high		
Male	35.5%	32.9%	31.6%	100.0%	76
Female	37.0%	27.8%	35.2%	100.0%	54
<b>Total</b>	<b>36.2%</b>	<b>30.8%</b>	<b>33.1%</b>	<b>100.0%</b>	<b>130</b>

Pearson Chi-Square value 0.413; df 2; P-value 0.814

Source: Research Data

#### ***4.4.3 Relationship between Academic Rank and Use of New Media in Scholarly Communication***

Analysis of Variance (ANOVA) was used to test whether there was any significant difference in the use of new media in scholarly communication across the current academic positions of the respondents. Tables 4.25 and 4.26 depict the results of the ANOVA test. Table 4.25 indicates that teaching assistants and assistant lecturers had a higher level of use of new media in scholarly communication mean scores compared to the more senior ranks of the teaching staff.

**Table 4.25: Descriptive statistics of frequency of use index score and academic position**

Age categories	N	Mean	Minimum	Maximum
Part-time lecturer	10	24.10	12	40
Teaching Assistant	4	34.50	28	40
Assistant Lecturer	14	28.79	8	40
Lecturer	54	23.22	8	40
Senior Lecturer	26	22.19	11	40
Associate Professor	19	23.58	8	40
Professor	3	22.33	18	27
<b>Total</b>	<b>130</b>	<b>24.06</b>	<b>8</b>	<b>40</b>

However, in order to find out whether the above difference in the level of use of new media in scholarly communication mean scores among the current position of teaching staff was significant or not, ANOVA was used. Table 4.26 depicts ANOVA comparing frequency of use mean scores across the current position of the teaching staff.

**Table 4.26: ANOVA comparing frequency of use mean scores across current position of respondents**

	Sum of Squares	Df	Mean Square	F	Significance
Between Groups	890.581	6	148.430	1.732	.119
Within Groups	10542.927	123	85.715		
Total	11433.508	129			

Means not significant at  $\alpha = 0.05$  significant level ( $p < 0.05$ )

Source: Research Data

Tables 4.26 indicates that the difference in frequency of use of new media mean scores between age categories was not statistically significant ( $p > 0.05$ ). Similarly, findings on Table 4.27 show that Junior lecturers tended to score higher (53.6%) in use of new media as compared to associate professors and professors who tended to score lower (40.9%). However, the difference in scores of use of new media in scholarly communication were not statistically significant across the different academic ranks ( $p > 0.05$ ). This suggests that academic rank was not a key determinant of use of new media technologies in scholarly communication.

To further confirm the findings presented above, frequency of use scores were transformed into a categorical variable (with low, average, and high use categories) and cross-tabulated with academic position of the respondent, and Chi-square test was carried out to test for the hypothesised association as shown in Table 4.27. Results reveal that there was no significant difference in scores of use of new media in scholarly communication by academic rank. This indicates that there seems to be no significant

relationship between academic rank and use of new media in scholarly communication ( $p > 0.05$ ). This finding agrees with Alharbi and Drew (2014), who found no significant relationship between academic rank and intention to use learning management systems (LMS) by academic staff in Saudi Arabia.

**Table 4.27: Academic position and use of new media tools**

Position	Level of frequency of use			Total	Number
	low	average	high		
Junior lecturer	17.9%	28.6%	53.6%	100.0%	28
Lecturer	38.9%	29.6%	31.5%	100.0%	54
Senior Lecturer	46.2%	34.6%	19.2%	100.0%	26
Associate professor or professor]	40.9%	31.8%	27.3%	100.0%	22
<b>Total</b>	<b>36.2%</b>	<b>30.8%</b>	<b>33.1%</b>	<b>100.0%</b>	<b>130</b>

Pearson Chi-Square Value: 9.089; df 6 P-value 0.169

#### ***4.4.4 Relationship between Attitude and Use of New Media in Scholarly Communication***

The study also sought to determine how attitude of academic staff influences their use of new media in scholarly communication. Attitude was assessed from a series of 4 statements seeking respondent's agreement or disagreement with its various dimensions. These statements were based on the UTAUT model with minor alterations to suit this study. The UTAUT model theorized that four constructs from the existing models aligned closely with the definition of attitude: These were attitude toward behaviour (TRA, TBB/DTPB, C-TAM-TPB), intrinsic motivation (MM), affect towards us (MPCU and affect (SCT) (Venkatesh, et al 2003). These constructs were collapsed in to four statements which this study utilised as shown in Table 4.28. Responses to these statements were measured on a five-point likert scale ranging from 1 to 5 (where, 1= strongly disagree, 2 = disagree, 3 = not sure, 4 = agree and 5 = strongly agree). The higher the score the more positive attitude towards using new media technologies influences their use in

scholarly communication, and vice versa. Table 4.28 shows the distribution of their responses on the statements.

**Table 4.28: Attitude towards use of new media in scholarly communication**

Aspects	Response (%)					Means	Std. Dev
	SD	D	NS	A	SA		
I like working with new media in my scholarly communication	13.1	18.5	23.8	32.3	12.3	3.12	1.233
New media makes scholarly communication very interesting	12.3	19.2	24.6	33.8	10.0	3.10	1.193
Using new media in scholarly communication is a good idea	13.1	16.9	27.7	33.1	9.2	3.08	1.181
Working with new media is my scholarly communication is fun	11.5	20.8	26.9	32.3	8.5	3.05	1.157

N = 130

Source: Research Data

Results show that respondents scored the constructs as follows in descending order from the highest to the lowest score based on Table 4.28 above: I like working with new media in my scholarly communication (mean: 3.12), New media makes scholarly communication very interesting (3.10), Using new media in scholarly communication is a good idea (3.08), and Working with new media is my scholarly communication is fun (3.05). These are above average scores; an indication of favourable attitude towards use of new media in scholarly communication.

The responses to each constituent dimension of attitude towards new media technologies were scored on a scale of 1, indicating least level of attitude, to 5, indicating highest level of attitude. The individual statement scores were summed up to form an attitude index

score for each respondent (reliability coefficient,  $\alpha = 0.986$ ). The index score varied between 4, indicating the least level of attitude, and 20, indicating the highest level of attitude towards use of new media in scholarly communication. The higher the score, the higher was the level of attitude towards use of new media in scholarly communication, and vice versa<sup>5</sup>. The index score had a mean score of 12.36 and Std dev. of 4.668 and was later collapsed into three ordinal categories in order to differentiate between the levels of attitude towards new media in scholarly communication among the sampled respondents. This included a score of 4-8 (negative attitude), 9-13 (neutral attitude) and 14-20 (positive attitude). Table 4.29 indicates that 41.5% of the respondents recorded a positive attitude towards use of new media in scholarly communication, 26.9% had a neutral attitude while 31.5% had a negative attitude.

**Table 4.29: Levels of influence of attitude on use of new media on scholarly communication**

<i>Levels of attitude</i>	<i>Frequency</i>	<i>Percent</i>
Negative	41	31.5
Neutral	35	26.9
Positive	54	41.5
<b>Total</b>	<b>130</b>	<b>100.0</b>

Source: Research Data

After determining the level of attitude towards new media in scholarly communication, Pearson-Product Moment Correlation Coefficient was used to establish if attitude was

---

<sup>5</sup>  $4 \times 1 = 4$  (negative attitude)

$4 \times 3 = 12$  (neutral attitude)

$4 \times 5 = 20$  (positive attitude)

related to use of new media in scholarly communication. Pearson's correlation coefficient was used to determine the strength and the direction of the relationship between the two variables (attitude index score and use of new media mean score). In this case, attitude was the independent variable while use of new media in scholarly communication was the dependent variable. Tables 4.30 highlights correlation coefficient matrix of the relationship between the two variables.

Table 4.30 shows that there was a significant positive relationship between attitude and use of new media in scholarly communication ( $r = +0.443$ ,  $p < 0.01$ ). Similarly, Table 4.31 shows that respondents who had a negative attitude towards new media also scored low (58.5%) on use of new media in scholarly communication. On the other hand, respondents who had a positive attitude also tended to score high in use of new media in scholarly communication (46.3%). This also shows a significant positive relationship between attitude and use of new media in scholarly communication ( $p < 0.05$ ). This suggests that attitude is a significant determinant of use of new media technologies in scholarly communication. This agrees with Kim, Chun and Song (2005) who found that regardless of the strength of the attitude toward using a new system, attitude toward using the system is the most important determinant of behavioural intention to use the system. This finding also agrees with the Theory of Reasoned Action (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975) that assumes the full mediating role of attitude on behavioural intention.



**Table 4.30: Correlation of attitude and frequency of use of new media in scholarly communication**

		Attitude index score	Frequency of use of new media
Attitude index score	Pearson Correlation	1	.443**
	Sig. (2-tailed)		.000
	N	130	130
Frequency of use of new media	Pearson Correlation	.443**	1
	Sig. (2-tailed)	.000	
	N	130	130

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

Source: Research Data

**Table 4.31: Relationship between attitude and frequency of use of new media in scholarly communication**

Attitude	Level of use			Total	Number
	Low	Average	High		
Negative	58.5%	29.3%	12.2%	100.0%	41
Neutral	37.1%	25.7%	37.1%	100.0%	35
Positive	18.5%	35.2%	46.3%	100.0%	54
<b>Total</b>	<b>36.2%</b>	<b>30.8%</b>	<b>33.1%</b>	<b>100.0%</b>	<b>130</b>

Pearson Chi-Square Value 19.432; df 4; p-value 0.001

Source: Research Data

#### ***4.4.5 Relationship between Anxiety and Use of New Media in Scholarly Communication***

The study also sought to determine the extent to which anxiety influenced the use of new media technologies in scholarly communication. Anxiety was assessed from a series of 4 statements seeking respondent's agreement or disagreement with its various dimensions. These statements were adapted from the original UTAUT model but with some

modifications to suit the current study. Responses to these statements were measured on a five-point likert scale ranging from 1 to 5 (where, 1= strongly disagree, 2 = disagree, 3 = not sure, 4 = agree and 5 = strongly agree). The higher the score of anxiety, the more it was likely to influence the use of new media in scholarly communication, and vice versa. As shown in Table 4.32, the highest level of anxiety (mean: 3.55) was reported in the construct ‘I fear losing control of my scholarly work when I use it with new media technologies’. This indicates that generally, many academic staff are not sure about the safety of their work when published using new media technologies. This is a universal concern with many people who publish online as discussed by Ilieva and Chakava, 2016).

**Table 4.32: Effect of anxiety on use of new media in scholarly communication**

<b>Aspects</b>	<b>Response (%)</b>					<b>Means</b>	<b>Std. Dev</b>
	<b>SD</b>	<b>D</b>	<b>NS</b>	<b>A</b>	<b>SA</b>		
I hesitate to use new media in my scholarly communication work for fear of making mistakes	33.1	21.5	8.5	23.1	13.8	2.63	1.484
I fear losing control of my scholarly work when I use it with new media technologies	19.2	8.5	6.2	30.0	36.2	3.55	1.520
I feel apprehensive (anxious) about using new media technologies in my scholarly communication	23.8	26.9	13.8	20.8	14.6	2.75	1.404
I find new media technologies somewhat intimidating for my use in scholarly communication	24.6	28.5	12.3	19.2	15.4	2.72	1.420

---

N = 130

Source: Research Data

The responses to each constituent dimension of anxiety about using new media in scholarly communication were scored on a scale of 1, indicating least level of anxiety, to 5, indicating highest level of anxiety. The individual statement scores were summed up to form an anxiety index score for each respondent (reliability coefficient,  $\alpha = 0.921$ ). The index score varied between 4, indicating the least level of anxiety, and 20, indicating the highest level of anxiety about using new media in scholarly communication. The higher the score, the higher was the level of anxiety about using new media technologies in scholarly communication, and vice versa<sup>6</sup>. The index score had a mean score of 11.66 and

---

<sup>6</sup>  $4 \times 1 = 4$  (less anxiety)

Std dev. of 5.242 and was later collapsed into three ordinal categories in order to differentiate between the levels of anxiety about using new media technologies in scholarly communication among the sampled respondents. This included a score of 4-8 (less anxiety), 9-13 (moderate anxiety) and 14-20 (more anxiety). Table 4.33 indicates that 36.9% percent of the respondents recorded less anxiety about using new media in scholarly communication, 28.5% had moderate anxiety while 34.6% had more anxiety.

**Table 4.33: Levels of influence of anxiety about using new media**

<i>Levels of anxiety</i>	<i>Frequency</i>	<i>Percent</i>
Less	48	36.9
Moderate	37	28.5
More	45	34.6
<b>Total</b>	<b>130</b>	<b>100.0</b>

After determining the level of anxiety on use of new media in scholarly communication, Pearson-Product Moment Correlation Coefficient was used to establish if anxiety was related to use of new media in scholarly communication. Pearson's correlation coefficient was used to determine the strength and the direction of the relationship between the two variables (anxiety index score and use of new media mean score). In this case, anxiety was the independent variable while use of new media was the dependent variable. Table 4.34 shows that there was a significant negative relationship between anxiety and use of new media in scholarly communication ( $r = -.422, p < 0.01$ ).

---

$4 \times 3 = 12$  (moderate anxiety)

$4 \times 5 = 20$  (more anxiety)

**Table 4.34: Correlation of anxiety and frequency of use of new media**

		anxiety score	index frequency of use of new media
Anxiety index score	Pearson	1	-.422**
	Correlation		
	Sig. (2-tailed)		.000
	N	130	130
Frequency of use of new media	Pearson	-.422**	1
	Correlation		
	Sig. (2-tailed)	.000	
	N	130	130

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

Source: Research Data

Similarly, findings as shown in Table 4.35 indicate that respondents who had less anxiety tended to score high (47.90%) on use of new media in scholarly communication while those who recorded more anxiety tended to score lower (55.60%) on use of new media in scholarly communication. The findings suggest that a growing anxiety about the use of new media in scholarly communication was likely to slow down the use of new media in scholarly communication ( $p < 0.05$ ). This finding agrees with Fuller et al (2006), who demonstrated that educators who are anxious or uncomfortable using computers would be more reluctant to adopt e-learning system in their teaching. Yang et al (1999) have also found that computer anxiety is one of the main factors for limited instructor's technology acceptance. The findings of this study also agree with other studies which have found that computer anxiety is associated with avoidance and a decreased use of information technology (Keeler & Anson, 1995; Todman & Monaghan 1994).

**Table 4.35: Distribution of anxiety and frequency of use of new media**

Anxiety	Level of frequency of use			Total	Number
	low	average	high		
Less	25.00%	27.10%	47.90%	100.00%	48
Moderate	27.00%	35.10%	37.80%	100.00%	37
More	55.60%	31.10%	13.30%	100.00%	45
	<b>36.20</b>		<b>33.10</b>	<b>100.00</b>	
<b>Total</b>	<b>%</b>	<b>30.80%</b>	<b>%</b>	<b>%</b>	<b>130</b>

Pearson Chi-Square Value 16.385; df 4; P-value 0.003

Source: Research Data

#### 4.5 Predictors of Use of New Media in Scholarly Communication

The study sought to examine the correlates and determinants of the use of new media in scholarly communication. Two statistical analyses were used to do this. First, use of new media in scholarly communication (dependent variable) was correlated with the several selected variables (independent variables) including performance expectancy, effort expectancy, attitude, social influence and anxiety. This was done to determine the strength and direction of the relationship between these independent variables and the dependent variable. Second, regression analysis was carried out to establish the relative importance of the independent variables to the dependent variable.

All the significant correlations between predicted independent variables and the dependent variables were identified from the correlation matrices. Table 4.36 lists the significant independent variables associated with the dependent variable.

All the independent variables had a significant correlation with use of new media in scholarly communication. Apart from anxiety, all the other variables had a positive significant correlation with frequency of use of new media in scholarly communication. As shown in Table 4.36, performance expectancy recorded a positive correlation of 0.508,

effort expectancy (0.472), attitude (0.443), social influence (0.317), and facilitating conditions (0.191). Anxiety recorded a negative correlation of (0.422).

**Table 4.36: Significant independent variables with the dependent variable**

Independent variable	Statistics	Frequency of use of new media in scholarly communication
Performance expectancy score	Pearson Correlation	.508**
	Sig. (2-tailed)	.000
	N	130
Effort expectancy score	Pearson Correlation	.472**
	Sig. (2-tailed)	.000
	N	130
Attitude index score	Pearson Correlation	.443**
	Sig. (2-tailed)	.000
	N	130
Social influence score	Pearson Correlation	.317**
	Sig. (2-tailed)	.000
	N	130
Facilitating conditions score	Pearson Correlation	.191*
	Sig. (2-tailed)	.030
	N	130
Anxiety index score	Pearson Correlation	-.422**
	Sig. (2-tailed)	.000
	N	130

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

\* . Correlation is significant at the 0.05 level (2-tailed).

#### **4.5.1 Bivariate analysis of factors associated with use of new media tools in scholarly communication**

Tables 4.37 and 4.38 present a summary of cross-tabulations of all the independent variables with the dependent variable, which was use of new media (a continuous variable) recoded into a categorical variable that had two categories: low use (0) and high use (1). The mean score on the “frequency of use of new media tools” variable, which was 24, was used to categorise the variable with those who scored 24 or below being put in one category and those who scored higher than 24 being put in the second category (low use and high use respectively). It should be noted here that prior to these analyses, some variables were recoded to collapse some categories which had very few cases. The first category of age, which in the original variable was under 30 years and had only 9 respondents, was combined with age group 31-40. Similarly, the oldest category – 61-70 – which had 13 cases was combined with 51-60 category. Part-time lecturer and Teaching Assistant had a total of 14 respondents and were combined with assistant lecturer just as *Full Professor* (3) were combined with *Professor* category. For similar reasons, level of education was collapsed into two categories namely *Masters or lower* (combining bachelors and Masters holders) and *PhD and above* (combining PhD and post-doctoral qualifications). The distribution of these variables in their original form is presented in appendix VI.

Among personal variables, only *Age of the Respondent* and *Level of Attitude* are statistically associated with level of use. Specifically, gender of the respondents did not have a statistically significant relationship with use of new media (p 0.835), just like their university (p 0.541), current academic rank (0.053) and education (0.867) which recorded a significance level of >0.5. Only age (p 0.044) and level of attitude (p 0.000) showed a statistically significant relationship.



**Table 4.37: Percentage distribution of respondents by level of use of new media tools and selected personal characteristics**

Personal factor		Frequency of use			Chi-square test (p-values)
		Low use %	High use %	Number	
Gender	Male	50.0%	50.0%	76	0.835
	Female	51.9%	48.1%	54	
Age	40 and Below	35.0%	65.0%	40	0.044*
	41 - 50	62.2%	37.8%	37	
	51 and older	54.7%	45.3%	53	
University	University of Nairobi	42.0%	58.0%	50	0.541
	Egerton University	58.8%	41.2%	17	
	Kenyatta University	52.4%	47.6%	21	
	Moi University	54.5%	45.5%	33	
	JKUAT	66.7%	33.3%	9	
Current Position in the University	Junior lecturer	28.6%	71.4%	28	0.053
	Lecturer	57.4%	42.6%	54	
	Senior Lecturer	61.5%	38.5%	26	
	Associate	50.0%	50.0%	22	
	Professor/Professor				
Education	Bachelors/Masters	51.50%	48.50%	68	0.867
	PhD/Post-doctorate	50.00%	50.00%	62	
Level of attitude	Negative	78.0%	22.0%	41	0.000*

Neutral	45.7%	54.3%	35
Positive	33.3%	66.7%	54
<b>Total</b>	<b>50.8</b>	<b>49.2</b>	<b>130</b>

Source: Research Data

All the other variables recorded a significant relationship with use of new media in scholarly communication apart from facilitating conditions (p 0.358). Specifically, performance expectancy had a significant relationship (p 0.000) just like effort expectancy (p 0.000), social influence (p 0.004) and anxiety (p 0.003) as shown in Table 4.38.

**Table 4.38: Percentage of respondents according to level of use by performance expectancy, effort expectancy, social influence and influence of facilitating conditions**

		Frequency of use		Number	Chi-square test (p-values)
		Low use %	High use %		
Level of performance expectancy	low	81.2%	18.8%	32	0.000*
	average	76.0%	24.0%	25	
	high	28.8%	71.2%	73	
Level of effort expectancy	low	73.8%	26.2%	42	0.000*
	average	56.8%	43.2%	37	
	high	27.5%	72.5%	51	
Level of social influence	low	66.7%	33.3%	48	0.004*
	average	51.2%	48.8%	41	
	high	31.7%	68.3%	41	
Level of influence of facilitating conditions	low	54.1%	45.9%	74	0.358
	average	50.0%	50.0%	46	

	high	30.0%	70.0%	10	
Level of anxiety in using new media	less	39.6%	60.4%	48	0.003*
	moderate	40.5%	59.5%	37	
	more	71.1%	28.9%	45	
<b>Total</b>		<b>50.8</b>	<b>49.2</b>	<b>130</b>	

\* Statistically significant at 95% confidence level

Source: Research Data

#### 4.5.2 Factors associated with use of new media tools in scholarly communication

This section presents results of logistic regression analyses. Two models were estimated: the first with all personal factors and the second with the four main independent variables of the study. As listed in Table 4.39, personal factors used in this study were: Gender; age; university the respondent was working in at the time of the study; current position in the university; education level of the respondent; and level of attitude towards use of new media tools. The other set of independent variables comprised: Level of performance expectancy; level of effort expectancy; level of social influence; and level of influence of facilitating conditions.

As discussed above, only two personal factors, namely *Age of the Respondent* and *Level of Attitude* were found to have a significant relationship with frequency of use of new media in scholarly communication. In contrast, only one of the other independent variables of the study – Level of influence of facilitating conditions – was found to lack a statistically significant association with the dependent variable. In summary, a logistic regression model was fitted using all the independent variables that were statistically associated with the dependent variable, which were: Age of the Respondent; Level of Attitude; Level of performance expectancy; Level of effort expectancy; Level of social influence; and Level of anxiety in using new media. As shown in Table 4.39, only one

main variable (performance expectancy) and two personal variables (age and attitude) were found to be statistically associated with the dependent variable (use of new media in scholarly communication). The results indicate that those who have high performance expectancy are 9.883 times more likely to use new media in scholarly communication compared with those with low performance expectancy and these differences are statistically significant ( $p$  value=0.007). Age was also found to be an important determinant with a significance level of 0.042 while attitude was a key determinant with a significance level of 0.031. Effort expectancy, facilitating conditions, social influence and anxiety were all found not to be statistically significant as determinants of use of new media in scholarly communication ( $p > 0.05$ ).

**Table 4.39: Logistic regression**

	Categories	Beta			Odds ratios
		coefficient	Standard errors	Significance	
Age	(40 or younger)				
	41-50	-1.185	0.582	0.042*	0.306
	51 and older	-0.696	0.586	0.235	0.499
Attitude	(Negative)				
	Neutral	1.429	0.662	0.031*	4.176
	Positive	0.853	0.753	0.257	2.346
Performance expectancy	(Low)				
	Average	0.895	0.790	0.257	2.446
	High	2.291	0.856	0.007*	9.883
Effort expectancy	(Low)				
	Average	-0.821	0.717	0.252	0.440
	High	0.261	0.790	0.741	1.299

Facilitating influence	(Low)	-0.256	0.503	0.612	0.774
	Average	0.641	0.867	0.460	1.899
	High				
Social influence	(Low)				
	Average	-0.249	0.599	0.678	0.780
	High	-0.272	0.700	0.697	0.762
Anxiety	(Low)				
	Moderate	0.230	0.610	0.706	1.258
	High	0.664	0.624	0.288	1.942
	Constant	-1.665	0.780	0.033	0.189

Reference categories are in brackets

Source: Research Data

#### **4.5.3 Isolating factors associated with use of new media in scholarly communication**

Results presented in the previous sections were based on univariate and bivariate analysis of the various independent variables on the dependent variable, which is use of new media in scholarly communication. Such procedures do not allow for inclusion of statistical controls hence it is impossible to say with any level of certainty that indeed those factors predict use of new media tools in scholarly communication. For instance, it is entirely possible that use of new media technology is a function of age rather (an individual attribute) and not, say, performance expectancy. Implied here is that to meet the overall goal of the study, it was necessary to subject the data to more robust statistical analyses that allow for inclusion of statistical control.

Thus, to isolate which independent variables indeed are associated with use of new media tools when the effects of all other variables are controlled for, the study used logistic regression analysis. Logistic regression analysis is a fairly straight forward procedure particularly because the odds ratios generated are easy to interpret and the relative contribution of each independent variable is determined.

The general logistic regression model is of the form:

$$p(\bar{x}) = \frac{\exp(\beta_0 + \beta_1 x_1 + \dots + \beta_p x_p)}{1 + \exp(\beta_0 + \beta_1 x_1 + \dots + \beta_p x_p)}$$

Where  $p(\pi)$  is the likelihood of making an observation and  $\beta$ s are regression coefficients and  $x$ s are the predictors in the model. To make the distribution linear, a logit transformation is carried out thus:

$$\log\left(\frac{p(\bar{x})}{1 - p(\bar{x})}\right) = \beta_0 + \beta_1 x_1 + \dots + \beta_p x_p$$

Odds ratios are computed by exponentiation of regression coefficients ( $\beta$ ). The odds ratios generated allow for direct observation of the contribution of each independent variable in the model.

The study utilised correlation and multiple regression analysis to determine the relationship between use of media and scholarly communication among university academic staff in Kenya. Most of the results obtained were based on univariate and bivariate analysis of the various independent variables on the dependent variable. Such procedures do not allow for inclusion of statistical controls hence it is impossible to say with any level of certainty that indeed those factors predict use of new media tools in scholarly communication. For instance, it is entirely possible that use of new media tools is a function of age rather (an individual attribute) and not, say, performance expectancy. Implied here is that to meet the overall goal of the study, it was necessary to subject the data to more robust statistical analyses that allow for inclusion of statistical control.

Thus, to isolate which independent variables are associated with use of new media in scholarly communication when the effects of all other variables are controlled for, the study used logistic regression analysis. Logistic regression analysis is a fairly straight forward procedure particularly because the odds ratios generated are easy to interpret and the relative contribution of each independent variable is determined.

After establishing the significant correlation between the selected independent variables and frequency of use of new media in scholarly communication, regression analysis was used to establish the relative importance of these independent variables to the dependent variable (use of new media in scholarly communication). From the signs of the regression coefficients ( $\beta$ ), the nature of association between the independent variables and dependent variable can be inferred. In order to compare and determine which of the independent variables is more important in relation to the dependent variable, standardized regression coefficient (Beta) was used. This was guided by the following regression model:

$$y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + e$$

Where:

y	dependent variable (frequency of use of new media)
X <sub>1</sub>	performance expectancy
X <sub>2</sub>	effort expectancy
X <sub>3</sub>	attitude
X <sub>4</sub>	social influence
X <sub>5</sub>	facilitating conditions
X <sub>6</sub>	anxiety

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$  regression coefficients (change in the dependent variable as a result of a unit change in the independent variable – x).

Based on the model above, logistic Regression was used to establish the relationship between the independent variables and the dependent variable of the study. Binary Logistic regression established relationships by converting a five-point Likert scale into two categories (high use and low use). The five-point Likert scale was; strongly agree (5),

agree (4), not sure (3), disagree (2) and strongly disagree (1). In such a scale, a midpoint was established. This was to infer that any score on the determinant of use of new media on scholarly communication which was more than 3.5 was a measure of agreement, while any score below 3.5 was a measure of disagreement. This approach is supported by Cohen, Manion and Morrison (2011).

Wald test was used to infer the significance of the relationship as generated by the Logistic Regression using five percent (5%) as the significance level. Omnibus Test and Hosmer and Lemeshow were also computed to test the fitness of the models. Benedict (2016) argues that before a model is relied upon to draw future prediction and to draw conclusions, goodness of fit test is supposed to be done to ensure that the model is fit against the statement that the model is not fit. According to Hosmer and Lemeshow test, a model is fit when the p-value is greater than 0.05 alpha and when the p-value is less than 0.05, the model fitness is poor. Using the Onimbus test, the model is fit when the p-values is less than 0.05 and when the p-value is greater than 0.05, the model is not fit.

#### **4.6 Hypotheses Testing**

The study sought to establish whether there was any significant influence of performance expectancy, effort expectancy, social influence, facilitating conditions and personal factors on the use of new media in scholarly communication among lecturers in public universities in Kenya. To establish this, the study tested the following five hypotheses:

1.  $H_0$  There is no relationship between performance expectancy and the use of new media in scholarly communication by university academic staff in Kenya;  
 $H_1$  There is a relationship between performance expectancy and the use of new media in scholarly communication by university academic staff in Kenya;
2.  $H_0$  There is no relationship between effort expectancy and the use of new media in scholarly communication by university academic staff in public universities in Kenya;



H<sub>1</sub> There is a relationship between effort expectancy and the use of new media in scholarly communication by university academic staff in public universities in Kenya;

3. H<sub>0</sub> There is no relationship between social influence and use of new media in scholarly communication by university academic staff in Kenya;

H<sub>1</sub> There is a relationship between social influence and use of new media in scholarly communication by university academic staff in Kenya;

4. H<sub>0</sub> There is no relationship between facilitating conditions and the use of new media in scholarly communication by university academic staff in Kenya;

H<sub>1</sub> There is a relationship between facilitating conditions and the use of new media in scholarly communication by university academic staff in Kenya;

5. H<sub>0</sub> There is no relationship between personal factors and use of new media technologies in scholarly communication by university academic staff.

H<sub>1</sub> There is a relationship between personal factors and use of new media technologies in scholarly communication by university academic staff.

Logistic Regression Analysis was used to establish the relationship between the five independent variables of the study and use of new media in scholarly communication. The five-point Likert scale were; strongly agree (5), agree (4), not sure (3), disagree (2) and strongly disagree (1). Any score on influence of performance expectancy on the use of new media in scholarly communication which was more than 3.5 was considered to be agreement, while any score below 3.5 was considered to be disagreement. Wald test statistic was used to test the hypotheses at a significant level of (5%). The decision rule was that if p-value was less than or equal to 0.05 ( $p = \leq 0.05$ ) the null hypothesis was rejected, meaning that there was a significant influence between variables under study. However, if the p-value was greater than 0.05 ( $p = \geq 0.05$ ), then there was enough evidence not to reject the null hypothesis.

Omnibus Test and Hosmer and Lemeshow were also computed to test the fitness of the models. Benedict (2016) argues that before a model is relied upon to draw future prediction and to draw conclusions, goodness of fit test is supposed to be done to ensure that the model is fit against the statement. According to Hosmer and Lemeshow test, a model is fit when the p-value is greater than 0.05 alpha and when the p-value is less than 0.05, the model fitness is poor. Using the Omnibus test, the model is fit when the p-values is less than 0.05 and when the p-value is greater than 0.05, the model is not fit.

#### **4.6.1 Hypothesis testing on relationship between performance expectancy and use of new media in scholarly communication**

The study sought to find out from the lecturers whether performance expectancy influences the use of new media in scholarly communication. The null hypothesis stated that there is no relationship between performance expectancy and the use of new media in scholarly communication by university academic staff in Kenya. The study sought opinions from lecturers in the five public universities to determine the influence of performance expectancy on the use of new media in scholarly communication. Table 4.40 shows the results of the hypotheses tested.

**Table 4.40: Hypotheses testing**

Variables	Variables in the Equation					
	Beta Coefficients	Standard Error	Wald	df	Significance	Odds ratios
Performance expectancy						
Low	.277	.729	.144	1	.704	1.319
High	2.017	.746	7.305	1	.007	7.514
Effort Expectancy						
Low	-.584	.682	.732	1	.392	.558
High	.310	.728	.182	1	.670	1.364
Social Influence						
Low	-.097	.544	.032	1	.858	.908
High	-.001	.624	.000	1	.999	.999
Facilitating Conditions						
Low						
High	-.135	.466	.085	1	.771	.873
Anxiety	.424	.893	.225	1	.635	1.528
Low						
High	.320	.530	.363	1	.547	1.377
Constant	-.583	.541	1.162	1	.281	.558
	-1.051	.654	2.580	1	.108	.350

The relationship between performance expectancy and use of new media in scholarly communication is significant given that the p-value was 0.007 which is less than 0.05. the null hypothesis on the effect of performance expectancy was therefore rejected implying that performance expectancy is a key determinant of use of new media in scholarly communication. This agrees with Akbar (2013) who found that performance expectancy had a significant influence on technology acceptance and that its effect was moderated by gender and age. Akbar's study sought to conduct empirical research testing the factors that influenced student's acceptance and use of technology in their academic environment. Another study by Tung and Chang (2008) found that when learners perceive e-learning as useful, they were more likely to accept and actually learn online. They also found that educators were likely to use e-learning since they found it easy to use in terms of greater

control over their work, improved job performance, time saving, accomplishing tasks more quickly and enhancing effectiveness.

### **The Logistic Function**

$$\text{Ln} (P/ (1-P)) = -1.051 + 2.017X_1$$

Where;

P: Probability of use of new media in scholarly communication

Ln (P/1-P): Logit of use of new media in scholarly communication

X<sub>1</sub>: Performance expectancy

From Table 4.40, it can be observed that a marginal increase in performance expectancy increases the use of new media in scholarly communication by a logit of (2.017) while holding all other factors constant. Also, looking at the odds ratio, it can be seen that among the high users of new media, a unit increase in performance expectancy increases the odds (likelihood) of use of new media in scholarly communication by 7.514 while controlling other factors.

#### **4.6.2 Hypothesis testing on relationship between effort expectancy and use of new media in scholarly communication**

The study sought to find out from the lecturers whether effort expectancy influences the use of new media in scholarly communication. The null hypothesis stated that there is no relationship between effort expectancy and the use of new media in scholarly communication by university academic staff in Kenya. The study sought opinions from the lecturers in the five public universities to determine the influence of effort expectancy on the use of new media in scholarly communication. From Table 4.40, it can be observed that a marginal increase in effort expectancy increases the use of new media in scholarly communication by a logit of (0.310) while holding all other factors constant. Also, looking at the odds ratio, it can be seen that among the high users of new media, a unit increase in effort expectancy increases the odds (likelihood) of use of new media in scholarly communication by 1.364 while controlling other factors. Consequently, from Table 4.40,

it can be seen that the  $p$  = value for effort expectancy is 0.670 which is more than 0.05. Therefore, the null hypothesis was accepted meaning that there is no significant relationship between effort expectancy and the use of new media in scholarly communication by university academic staff in Kenya.

### **The Logistic Function**

$$\ln(P/(1-P)) = -1.051 + 0.310X_2$$

Where;

$P$ : Probability of use of new media in scholarly communication

$\ln(P/1-P)$ : Logit of use of new media in scholarly communication

$X_2$ : Effort expectancy

This suggests that effort expectancy is not a key determinant of use of new media technologies in scholarly communication by university academic staff in public universities in Kenya. This disagrees with a study by Akbar (2013) who found effort expectancy to have a significant influence on the adoption of technology in education. Ong and Lai (2006) also found that effort expectancy had a significant influence on the behavioural intentions of students to use e-learning and that effort expectancy of e-learning (i.e. less mental effort, less frustrating, flexible, less rigid, easy to understand and helpful guidance in performing tasks) influenced the intention of lecturers in Jordan to adopt e-learning system.

### **4.6.3 Hypothesis testing on relationship between social influence and use of new media in scholarly communication**

The study sought to find out from the lecturers whether social influence has an effect on the use of new media in scholarly communication. The null hypothesis stated that there is no relationship between social influence and the use of new media in scholarly communication by university academic staff in Kenya. From Table 4.40, it can be observed that a marginal increase in social influence decreases the use of new media in

scholarly communication by a logit of (0.001) while holding all other factors constant. Also, looking at the odds ratio, it can be seen that among the high users of new media, a unit increase in social influence increases the odds (likelihood) of use of new media in scholarly communication by 0.999 while controlling other factors. However, from Table 4.40, it can be seen that the  $p =$  value for social influence is 0.999 which is more than 0.05. Therefore, there was enough evidence not to reject the null hypothesis meaning that there is no significant relationship between social influence and the use of new media in scholarly communication by university academic staff in Kenya.

### **The Logistic Function**

$$\text{Ln} (P/ (1-P)) = -1.051 - 0.001X_3$$

Where;

P: Probability of use of new media in scholarly communication

Ln (P/1-P): Logit of use of new media in scholarly communication

$X_3$ : Social influence

### **4.6.4 Hypothesis testing on relationship between facilitating conditions and use of new media in scholarly communication**

The study sought to find out from the lecturers whether the presence of facilitating conditions has an effect on the use of new media in scholarly communication. The null hypothesis stated that there is no relationship between facilitating conditions and the use of new media in scholarly communication by university academic staff in Kenya. As shown in Table 4.40, it was observed that a marginal increase in facilitating conditions increases the use of new media in scholarly communication by a logit of (0.424) while holding all other factors constant. Also, looking at the odds ratio, it can be seen that among the high users of new media, a unit increase in facilitating conditions increases the odds (likelihood) of use of new media in scholarly communication by 1.528 while controlling other factors. However, from Table 4.40, it can be seen that the  $p =$  value for facilitating conditions is 0.635 which is more than 0.05. Therefore, there was enough evidence not to

reject the null hypothesis meaning that there was no significant relationship between facilitating conditions and use of new media in scholarly communication by university academic staff in Kenya.

### **The Logistic Function**

$$\text{Ln} (P/ (1-P)) = -1.051 + 0.424X_4$$

Where;

P: Probability of use of new media in scholarly communication

Ln (P/1-P): Logit of use of new media in scholarly communication

X<sub>4</sub>: Facilitating conditions

### **4.6.5 Hypothesis testing on the moderating influence of personal factors on the relationship between independent variables and use of new media in scholarly communication**

The study sought to assess the moderating influence of personal factors on the relationship between the independent variables and use of new media technologies in scholarly communication by university academic staff. This hypothesis was informed by the UTAUT model which suggests that the effect of the four key constructs identified in hypotheses 1-4 is moderated by four other variables: age, gender, experience and attitude towards use. In this study, four personal factors measured at different levels or scales of measurement and believed to moderate the relationship between the independent variables and use of new media in scholarly communication were used. These factors include age, gender, attitude and anxiety. Table 4.41 shows a summary of the findings of the effect of these personal factors on the relationship between the independent variables and the dependent variable (use of new media in scholarly communication).

**Table 4.41: Moderating effect of personal factors on the relationship between independent variables and the dependent variable**

Variables	Variables in the Equation			df	Significance	Odd Ratios
	Beta Coefficients	Standard Error	Wald			
<b>Performance</b>						
<b>Expectancy</b>			9.805	2	.007	
Low	.010	.776	.000	1	.990	1.010
High	1.973	.803	6.044	1	.014	7.194
Effort Expectancy			4.039	2	.133	
Low	-.796	.718	1.231	1	.267	.451
High	.411	.791	.269	1	.604	1.508
Social Influence			.015	2	.993	
Low	-.070	.601	.013	1	.908	.933
High	-.027	.713	.001	1	.970	.973
Facilitating Conditions			.866	2	.649	
Low	-.272	.497	.300	1	.584	.762
High	.572	.921	.385	1	.535	1.772
Anxiety			1.446	2	.485	
Low	.184	.578	.102	1	.750	1.202
High	-.528	.605	.761	1	.383	.590
Age			3.878	2	.144	
Below 40	-1.121	.575	3.805	1	.051	.326
41-50	-.745	.572	1.696	1	.193	.475
Above 51	-.774	.493	2.459	1	.117	.461
Attitude			3.745	2	.154	
Positive	1.170	.663	3.119	1	.077	3.222
Negative	.265	.776	.116	1	.733	1.303
Constant	-.381	.858	.197	1	.657	.683

Table 4.41 shows that the moderating influence of personal factors (age, anxiety gender and attitude) on the relationship between the independent variables and use of new media in scholarly communication was very marginal. As observed, only performance



expectancy variable showed a statistically significant influence from personal factors with use of new media. The odds ratios for increased use of new media in scholarly communication when performance expectancy increased marginally were 7.514 (Table 4.40). However, when the effect of these personal factors was considered together with the other variables, the odds ratios dropped marginally to 7.194. Additionally, the  $p$  = value for facilitating conditions remains 0.007 which is more than 0.05. This indicates that personal factors had a marginal negative moderating influence on the relationship between performance expectancy and the use of new media in scholarly communication. All the other variables recorded a  $p$ -value of more than 0.05 hence the interaction between effort expectancy, social influence and facilitating conditions with the use of new media was not moderated by personal factors like attitude, age anxiety and gender.

This finding seems to disagree with various scholars who have found personal factors to have a significant moderating effect on the relationship between performance expectancy, effort expectancy, facilitating conditions and use of new technology ((Fuller, 2006); Yang et al (1999); Basheer (2010); Murumbwa (2013); Kim, Chun and Yang (2005); Keeler & Anson (1995); and Todman & Monaghan (1994)). Fuller et al (2006) demonstrated that educators who are anxious or uncomfortable using computers would be more reluctant to adopt e-learning system in their teaching. Yang et al (1999) have also found that computer anxiety is one of the main factors for limited instructor's technology acceptance. The findings of this study also disagree with other studies which have found that computer anxiety is associated with avoidance and a decreased use of information technology (Keeler & Anson, 1995; Todman & Monaghan 1994).

Kim, Chun and Song (2005) found that regardless of the strength of the attitude toward using a new system, attitude toward using a technology is the most important determinant of behavioural intention to use the technology. A study by Marumbwa (2013) which sought to explore the moderating effects of socio-demographic variables on consumer acceptance and use of mobile money transfer services (MMTs) in southern Zimbabwe

revealed that younger people were generally tech savvy and as such may therefore readily embrace new innovative technology products such as new media. A similar study by Basheer (2010) also revealed that younger lecturers adopted e-learning faster than their older colleagues. This observation also confirms Davis (1989)'s proposition that young consumers are highly technologically active in terms of their adoption, understanding, usage and perception of new tech products and applications. Similar findings were reported by Marumbwa (2014) who found an insignificant relationship between gender and consumer acceptance and use of mobile money transfer services (MMTs) in Southern Zimbabwe.

#### 4.6.6 Hypotheses testing on combined variables under investigation

The study sought to establish the influence of; performance expectancy, effort expectancy, social influence, facilitating conditions and personal factors on the use of new media in scholarly communication. Table 4.42 shows the model fitness of the variables under study.

Omnibus test of model coefficients shows the significance of the predictive capacity of the model when independent variables of the study are considered as a block. It can be observed that the p – value of the model as a block was  $p=0.000$  which is less than 0.05. This shows that the model has a significant predictive capacity.

*Table 4.42: Combined Model Fitness Tests*

Test	Type of Statistic	Value of Statistic	P-Value
Omnibus	Chi-Square	48.796	0.000
Hosmer and Lemeshow	Chi-Square	8.2888	0.417
Model Summary			
Nagelkerke R Square =			
0.417			

The Model summary also shows that the model predicts 41.7% of the variations in use of new media in scholarly communication, based on the Nagelkerke R Squared which is a pseudo Pearson's R square. Hosmer and Lemeshow Test measures whether the model is fit for prediction with the null hypothesis that the model is fit against the alternate that the model is not fit. The results show that  $\chi^2(8) = 8.2888$ ,  $p=0.417$ . Therefore, the null hypothesis is not rejected implying that the model is fit.

### **The Logistic Function**

From Table 4.41;

$$\ln(P/(1-P)) = -0.381 + 1.973X_1 + 0.411X_2 - 0.027X_3 + 0.572X_4 - 0.528X_5 - 1.121X_6 + 1.170X_7$$

Where:-

P: Probability of use of new media in scholarly communication

$\ln(P/1-P)$ : Logit of use of new media in scholarly communication

$X_1$ : Performance expectancy

$X_2$ : Effort expectancy

$X_3$ : Social influence

$X_4$ : Facilitating conditions

$X_5$ : Anxiety

$X_6$ : Age

$X_7$ : Attitude

From Table 4.41 and the Logistic Regression Function, observations can be made that a marginal increase in performance expectancy increases the logit of use of new media in scholarly communication by 0.803 while accounting for moderating variables. Looking at the odds ratio, it can be construed that a unit increase in performance expectancy increases the odds (likelihood) of use of new media in scholarly communication by 7.194, when accounting for moderating variables.

A marginal increase in effort expectancy increases the logit of use of new media in scholarly communication by 0.791 when moderating variables are accounted for. Also, looking at the odds ratio, it can be construed that a unit increase in effort expectancy increases the odds (likelihood) of use of new media in scholarly communication by 1.508 when moderating variables are accounted for.

A marginal increase in social influence increases the logit of use of new media in scholarly communication by 0.713 while holding all other factors constant. Also, looking at the odds ratio, it can be construed that a unit increase in social influence increases the odds (likelihood) of use of new media in scholarly communication by 0.973 when moderating variables are accounted for.

A marginal increase in the presence of facilitating conditions increases the logit of use of new media in scholarly communication by 0.921 when moderating variables are accounted for. Also, looking at the odds ratio, it can be construed that a unit increase in the presence of facilitating conditions increases the odds (likelihood) of use of new media in scholarly communication by 1.1772 when moderating variables are accounted for.

The study revealed that performance expectancy towards the use of new media (P-Value = 0.007) was the only significant variable influencing the use of new media in scholarly communication when moderating variables are accounted for. Effort expectancy (P-Value = 0.133), social influence (P-Value = 0.993), facilitating conditions (P-Value = 0.649), anxiety (P-Value = 0.485), age (P-Value = 0.144) and attitude towards use of new media (P-Value = 0.154) were not found to be significant at 5% significance level.

#### **4.7 Conclusion**

This chapter has presented the findings of this study which sought to outline the determinants of use of new media in scholarly communication by university academic staff in public universities in Kenya. The study sought to determine the influence of factors

like performance expectancy, effort expectancy, facilitating conditions and personal factors towards use of new media technologies in scholarly communication. Results show that only performance expectancy had a significant relationship with the use of new media in scholarly communication by public university academic staff in Kenya. Effort expectancy, social influence, facilitating conditions, anxiety, gender and attitude were found not to be statistically associated with use of new media in scholarly communication.

## **CHEPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents a summary of the outcomes of the study on the determinants of use of new media in scholarly communication by university academic staff in public universities in Kenya. The conclusions and recommendations of the study are then presented.

#### **5.2 Summary of the Study**

The study sought to establish the determinants of use of new media technologies in scholarly communication by university academic staff from selected public universities in Kenya. The objectives of the study were to: To examine the influence of performance expectancy on use of new media in scholarly communication by university academic staff in Kenya; To assess the influence of effort expectancy on use of new media in scholarly communication by university academic staff in public universities in Kenya; To analyse the effect of social influence on the use of new media in scholarly communication by university academic staff in Kenya; To evaluate the effect of facilitating conditions on use of new media technologies in scholarly communication by university academic staff in Kenya; and to assess the influence of personal factors on the use of new media technologies in scholarly communication by university academic staff. Conclusions and recommendations of the study are discussed based on each of these objectives.

The study used the unified theory of acceptance and use of technology (UTAUT) by Venkatesh, Morris, Davis, and Davis (2003) as a theoretical basis to conduct empirical research testing of the determinants of use of new media in scholarly communication by university lecturers. This was a quantitative survey research. The study population comprised of university lecturers in public universities in Kenya. The target population for the survey was drawn from lecturers from five selected universities which included University of Nairobi, Kenyatta University, Moi University, JKUAT and Egerton

University. A self-administered questionnaire was distributed to the lecturers in the five universities for data collection. 130 lecturers responded and returned the questionnaire. Of these respondents, 52% were male while 42% were female.

Publication of journal papers and presentation at conferences were found to be the most popular forms of scholarly communication with respondents whereas publication of books and book chapters and editorship of journals were the least popular. Most scholarly publications were a hybrid of print and electronic formats. From the findings, online publishing was the most preferred tool for scholarly communication by respondents.

A bivariate analysis of factors associated with use of new media in scholarly communication revealed that Among personal variables, only *Age of the Respondent* and *Level of Attitude* were statistically associated with level of use. Specifically, gender of the respondents did not have a statistically significant relationship with use of new media, just like their university, current academic rank and education. Only age and level of attitude showed a statistically significant relationship. Performance expectancy, effort expectancy, social influence, and anxiety recorded a significant relationship with use of new media in scholarly communication whereas facilitating conditions did not. Further, a logistic regression model was fitted using all the independent variables that were statistically associated with the dependent variable, which were: Age of the Respondent; Level of Attitude; Level of performance expectancy; Level of effort expectancy; Level of social influence; and Level of anxiety in using new media. However, only performance expectancy was found to be statistically significant when all other variables were controlled for. The Model summary also showed that the model predicts 41.7% of the variations in use of new media in scholarly communication, based on the Nagelkerke R Squared which is a pseudo Pearson's R square.

### **5.3 Conclusions of the Study**

Based on the objectives, the study concludes the following:

### **5.3.1 Influence of performance expectancy on use of new media in scholarly communication**

This study sought to determine whether performance expectancy influences the use of new media in scholarly communication by academic staff in Kenya's public universities. Performance expectancy is defined as 'the degree to which an individual believes that using a new technology will help him or her to attain gains in job performance' (Venkatesh *et al.* 2003). The key constructs of performance expectancy are (1) perceived usefulness (PU), (2) extrinsic motivation, (3) the job fit, (4) relative advantage, and (5) outcome expectations. Scores of performance expectancy were correlated with those of level of usage of new media in scholarly communication. Results indicate that respondents who recorded a low level of performance expectancy also reported low usage of new media in scholarly communication. On the other hand, respondents who recorded a high level of performance expectancy also tended to report a high frequency of usage of new media in their scholarly communication. Further, a logistic regression model was fitted using all the independent variables that were statistically associated with the dependent variable. Performance expectancy recorded an impressive statistical significance. This shows the existence of a significant relationship between performance expectancy and the use of new media in scholarly communication by university academic staff.

The study thus concludes that university academic staff in Kenya who are using new media in scholarly communication believe that using such media will help them to attain gains in their scholarly communication. This implies that performance expectancy is a key determinant of use of new media in scholarly communication by university academic staff in Kenya's public universities. This finding agrees with a survey conducted by Rowlands *et al.*, (2011) on use of social media in research flow at the University College of London. It was indicated that social networks have found serious application at all points of research life cycle, from identifying research opportunities to disseminating findings at the end. The study also found that the most popular tools for scholarly communication are those that allow collaborative authoring, conferencing, scheduling and meeting tools.



This result also agrees with Akbar (2013) who found that performance expectancy had a significant influence on use of new technology and that its effect was moderated by gender and age. Akbar's study sought to conduct empirical research testing the factors that influenced student's acceptance and use of technology in their academic environment. Another study by Tung and Chang (2008) found that when learners perceive e-learning as useful, they were more likely to accept and actually learn online. They also found that educators were likely to use e-learning since they found it easy to use in terms of greater control over their work, improved job performance, time saving, accomplishing tasks more quickly and enhancing effectiveness.

### **5.3.2 Influence of effort expectancy on use of new media in scholarly communication**

The study sought to establish the extent to which effort expectancy determines the use of new media technologies in scholarly communication by university academic staff in public universities in Kenya. Effort expectancy is defined as the 'degree of ease associated with the use of a new technology (Venkatesh *et al.* 2003). Its principal pillars are (1) perceived ease of use, (2) complexity, and (3) ease of use. Scores of effort expectancy were then correlated with those of frequency of use of new media in scholarly communication to establish the extent to which effort expectancy influenced the use of new media in scholarly communication. It was observed that respondents who recorded a low level of effort expectancy also reported a low frequency of use of new media in scholarly communication. On the other hand, respondents who recorded a high level of effort expectancy also reported a high frequency of use of new media in scholarly communication. However, effort expectancy and use of new media were found not to be statistically associated when a logistic regression model was fitted.

This suggests that effort expectancy was not a key determinant of use new media technologies in scholarly communication by university academic staff in public universities in Kenya. This implies that academic staff did not consider new media as being easy to use in scholarly communication. This finding disagrees with Akbar (2013)

who found effort expectancy to have a significant influence on the adoption of technology in education. Ong and Lai (2006) also found that effort expectancy had a significant influence on the behavioural intentions of students to use e-learning and that effort expectancy of e-learning (i.e. less mental effort, less frustrating, flexible, less rigid, easy to understand and helpful guidance in performing tasks) influenced the intention of lecturers in Jordan to adopt e-learning system.

The reason why many academic staff believe that new media is not easy to use in scholarly communication could be that many users of such media associate them with social networking rather than academic work. A study conducted by Madhusudhan (2012) on how research scholars at the University of Delhi integrated social networks sites (SNS) into their daily communication research work found that most scholars use SNS as an interactive platform rather than for academic communication. The results of the study indicated that scholars used SNS for networking, uploading photos, searching for jobs and interacting with friends. SNSs were least used for sharing of research work by the scholars.

### **5.3.3 Influence of social influence on use of new media in scholarly communication**

The study also set out to assess the impact of social influence on the use of new media technologies in scholarly communication by university academic staff in Kenya. *Social influence* is defined as ‘the degree to which an individual perceives that important others believe he or she should use the new system’ (Venkatesh *et al.* (2003). Its root constructs include (1) subjective norms, (2) social factors, and (3) the image. Majority of the respondents recorded a low to moderate score of social influence.

When scores of social influence were compared with those of frequency of use of new media in scholarly communication, results revealed that respondents who scored low on social influence also tended to score low on frequency of use of new media in scholarly communication. Similarly, respondents who scored high on social influence also tended to score high on frequency of use. However, there was no significant relationship between

social influence and use of new media in scholarly communication. This indicates that, to a large extent, academic staff in public universities do not perceive that important others believe they should use new media in their scholarly communication activities. As a result, social influence was found not to be a key determinant of use of new media in scholarly communication. This finding disagrees with other studies which have found a strong support for the relationship between social influence and behavioural intention to use technology (Kleijnen et al 2004, Hung et al 2002). Kleijnen et al (2004) reported that social influence had a significant influence on people's intention to use wireless finance. Chang and Cheung (2001) also found that social influence was significant to intention to use the internet at the workplace. This is partly because whereas scholarly publishing is a requirement for tenure and promotion of academic staff in Kenya, many universities have not placed emphasis on online and new media platforms for scholarly communication.

#### **5.3.4 Influence of facilitating conditions on the use of new media in scholarly communication**

The study sought to evaluate whether facilitating conditions influenced the use of new media technologies in scholarly communication by university academic staff in Kenya. Facilitating conditions are the variables theorised to have a direct effect on system usage and are defined as 'the degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system' (Venkatesh *et al.* 2003). The key constructs are (1) perceived behavioural control, (2) facilitating conditions, and (3) compatibility. Most of the respondents returned a low score of facilitating conditions. Scores of level of influence of facilitating conditions were compared with those of frequency of use of new media in scholarly communication to ascertain whether there was any significant relationship between the two variables. It was found that respondents who scored low on facilitating conditions tended to score low on use of new media whereas those who scored high on facilitating conditions also tended to score high on use of new media in scholarly communication. However, findings show that there was no significant

relationship between the two variables hence suggesting that facilitating conditions were not a key determinant of use of new media in scholarly communication.

This implies that university academic staff do not believe that an organisational and technical infrastructure exists to support their use of new media technologies in scholarly communication. Thus, facilitating conditions, the study concludes, is not a key determinant of use of new media in scholarly communication by university academic staff in public universities in Kenya. Similar views have been recorded by Ngobeni (2010) who observes that African scholarly communication still continues to suffer from low or lack of government funding. African governments significantly cut funding to university libraries leading to book famine and poor technology installation which meant that scholars could not easily access up-to-date journals and books – hence they could not produce quality research papers. In the foregoing, the concomitant and index of scholarly research declined in terms of output, quality and regularity of publications due to a decline in funding for education (Mlambo, 2007). This limited funding has also affected new media facilities like internet connectivity, provision of computers and training. Most African Universities have not taken strategic approaches to scholarly communication nor utilised appropriate ICTs and new media technologies to broaden the reach of their scholar's work. As a result, the impact and visibility of African research output remains low (Trotter et al, 2014).

#### **5.3.5 Moderating Influence of personal factors on the relationship between the independent variables and the use of new media in scholarly communication**

The fifth objective sought to assess the moderating influence of personal factors on the relationship between the independent variables and the use of new media technologies in scholarly communication by university academic staff. Several personal factors measured at different levels or scales of measurement and believed to influence the relationship between the independent variables and the use of new media were used. These factors include age, gender, academic rank in the university, attitude and anxiety.

**i. Influence of Age on Use of New Media in Scholarly Communication**

Analysis of Variance (ANOVA) was used to test whether there was any significant difference in the frequency of use of new media across the age categories of the respondents. Younger teaching staff members aged below 40 years had higher use of new media mean scores compared to the relatively older colleagues aged above 40 years. The difference in use of new media mean scores between age categories was statistically significant.

When the respondents' age was compared with their scores of use of new media in scholarly communication to ascertain whether there was any significant relationship, it was observed that younger respondents aged below 30 scored very high in use of new media in scholarly communication as compared to respondents aged over 60 who scored low on use of new media in scholarly communication. Findings also showed the presence of a significant moderating relationship between age and the use of new media in scholarly communication. However, this finding was not confirmed when a logistic regression model was fitted with age of the respondents.

This suggests that age of academic staff did not pose a significant moderating influence on the relationship between the independent variables and use of new media technologies in scholarly communication. This finding disagrees with a study by Marumbwa (2013) which revealed that younger people were generally tech savvy and as such may therefore readily embrace new innovative technology products such as new media. A similar study by Basheer (2010) also revealed that younger lecturers adopted e-learning faster than their older colleagues. A similar observation by Davis (1989) confirms that young consumers are highly technologically active in terms of their adoption, understanding, usage and perception of new technology products and applications. The reason for the disagreement could be that most lecturers in the universities that were studied are aged over forty hence there very few cases of lecturers aged below 30 to make a statistically significant inference.

## **ii. Influence of Gender on Use of New Media in Scholarly Communication**

The study also sought to determine whether there was any significant difference in the use of new media across gender of the respondents. Independent sample t-test was used to determine if the use of new media mean scores between two unrelated samples (male and female teaching staff) differed significantly or not. It was observed that female teaching staff had a higher frequency of use mean score compared to their male counterparts. However, the difference in scores between members of the two gender was not statistically significant. This finding was also confirmed using a Chi-Square test. This suggests that the gender of the teaching staff did not significantly influence their frequency of use of new media in scholarly communication. The finding agrees with a study conducted by Marumbwa (2014) who found an insignificant relationship between gender and consumer acceptance and use of mobile money transfer services (MMTs) in Southern Zimbabwe.

## **iii. Influence of Academic Rank on Use of New Media in Scholarly Communication**

Analysis of Variance (ANOVA) was used to test whether there was any significant difference in the use of new media in scholarly communication across the current academic positions of the respondents. It was observed that junior lecturers tended to score higher in use of new media as compared to associate professors and professors who tended to score lower. However, the difference in scores of use of new media in scholarly communication were not statistically significant across the different academic ranks. This suggests that academic rank was not a key determinant of use of new media technologies in scholarly communication. This finding was confirmed using Chi-square test which also showed that there was no significant difference in scores of use of new media in scholarly communication by academic rank. This finding agrees with Alharbi and Drew (2014), who found no significant relationship between academic rank and intention to use learning management systems (LMS) by academic staff in Saudi Arabia.

#### **iv. Influence of Attitude on Use of New Media in Scholarly Communication**

The study also sought to outline how attitude towards new media impacts on their use in scholarly communication. Venkatesh et al (2003) defined attitude towards a technology as an individual's overall affective reaction to using a technology. The UTAUT model found that four constructs from existing models aligned closely with this definition: attitude towards behaviour (TRA, TBB/DTPB, C-TAM-TPB), intrinsic motivation (mm), affect towards use (MPCU), and affect (SCT).

After determining the level of attitude towards new media in scholarly communication, Pearson-Product Moment Correlation Coefficient was used to establish if attitude was related to use of new media in scholarly communication. Respondents who had a negative attitude towards new media also scored low on use of new media in scholarly communication. On the other hand, respondents who had a positive attitude also tended to score high in use of new media in scholarly communication. Using Pearson-Product Moment Correlation Coefficient, it was observed that there was a significant positive relationship between attitude and use of new media in scholarly communication. However, this finding was not sustained when a logistic regression model was fitted using all the independent variables that were statistically associated with the dependent variable.

The study then concludes that attitude is a significant determinant of use of new media technologies in scholarly communication. A study by Kim, Chun and Song (2005) also similarly found that regardless of the strength of the attitude toward using a new system, attitude toward using the system is the most important determinant of behavioural intention to use the system. This finding also agrees with the Theory of Reasoned Action (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975) that assumes the full mediating role of attitude on behavioural intention. However, the finding slightly differs from the studies of the technology acceptance model (Davis et al., 1989; Venkatesh and Davis, 2000) that argue for a partial or minimal mediating role of attitude on behavioural intention.

**v. Influence of Anxiety on the Use of New Media in Scholarly Communication**

Finally, the study sought to assess the extent to which anxiety influences use behaviour of new media technologies in scholarly communication. Anxiety was defined as a feeling of worry, nervousness, or unease associated with using a new technology (Venkatesh, et al 2003). After determining the level of anxiety on use of new media in scholarly communication, Pearson-Product Moment Correlation Coefficient was used to establish if anxiety was related to use of new media in scholarly communication. Respondents who had less anxiety tended to score high on use of new media while those who recorded more anxiety tended to score lower on use of new media in scholarly communication. This observation suggests that a growing anxiety about the use of new media in scholarly communication was likely to slow down the use of new media in scholarly communication. There was a significant negative relationship between attitude and use of new media in scholarly communication. However, anxiety and use of new media were found not to be statistically associated when a logistic regression model was fitted.

This finding seems to disagree with Fuller *at al.* (2006), who demonstrated that educators who are anxious or uncomfortable using computers would be more reluctant to adopt e-learning system in their teaching. Yang et all (1999) have also found that computer anxiety is one of the main factors for limited instructor's technology acceptance. The findings of this study also significantly disagree with other studies which have found that computer anxiety is associated with avoidance and a decreased use of information technology (Keeler & Anson, 1995; Todman & Monaghan 1994).

**5.4 Summary of Hypothesis Testing**

Wald test was used to test whether there was any significant influence of performance expectancy, effort expectancy, social influence, presence of facilitating conditions and personal factors on the use of new media in scholarly communication. Omnibus test of model coefficients and Hosmer and Lemeshow Tests were used to test the fitness of the



models. It was established that the models were fit to test the variables under investigation. The responses were sought from lecturers in five public universities in Kenya.

Each variable was considered separately, and performance expectancy, age and attitude were found to have a significant influence on the use of new media in scholarly communication. However, when the variables were considered as a block, only performance expectancy was found to have a significant relationship with the use of new media in scholarly communication (0.05 significance level) with  $p\text{-value} = 0.007$  based on lecturers' responses.

The moderating influence of personal factors (age, anxiety gender and attitude) on the relationship between the independent variables and use of new media in scholarly communication was very marginal. As observed, only performance expectancy variable showed a statistically significant influence from personal factors with use of new media. The odds ratios for increased use of new media in scholarly communication when performance expectancy increased marginally were 7.514. However, when the effect of these personal factors was considered together with the other variables, the odds ratios dropped marginally to 7.194. Additionally, the  $p =$  value for facilitating conditions remains 0.007 which is more than 0.05. This indicates that personal factors had a marginal negative moderating influence on the relationship between performance expectancy and the use of new media in scholarly communication. All the other variables recorded a  $p$ -value of more than 0.05 hence the interaction between effort expectancy, social influence and facilitating conditions with the use of new media was not moderated by personal factors like attitude, age anxiety and gender.

## **5.5 Recommendations of the Study**

Based on the findings discussed, this study recommends the following:

1. Performance expectancy is a key determinant of use of new media technologies in scholarly communication by university academic staff in Kenya. Performance

expectancy refers to the degree to which an individual believes that using the system will help him or her to attain gains in job performance (Venkatesh, et al 2003). This indicates that university academic staff believe that using new media will help them attain better gains in their scholarly communication. There is therefore need to invest in more diverse new media technologies at the institutional and national level. New media technologies have the potential to put Kenya on the world map in terms of research dissemination. The study found that academic staff do not only believe that new media technologies will help them to publish more but also to produce quality publications. Universities should invest heavily in infrastructure that will increase the use of new media technologies in scholarly communications. These facilities include sufficient internet bandwidth, adequate computers and competent human resources to support academic staff in using these facilities.

2. Universities should create a conducive environment for use of new media technologies in scholarly communication and provide the relevant infrastructure to support the use of new media. This study found that facilitating conditions were not a key determinant of use of new media in scholarly communication. Facilitating conditions refer to the degree to which an individual believes that an organisational and technical infrastructure exists to support the use of new technology' (Venkatesh *et al.* 2003). This finding therefore means that most lecturers do not believe that they are provided with the relevant organisational and technical infrastructure to support their use of new media in scholarly communication. These facilitating conditions include training, human resource support system, provision of computers and allied equipment as well as adequate and reliable internet connectivity in all campuses and offices from where lecturers work. This will help to reduce anxiety among users of new media technologies in their scholarly communication activities.
3. Universities and other stakeholders like the Commission for University Education need to place more premium on use of new media in scholarly communication by

including it as part of the promotion criteria. For instance, academic blogging should be considered as a contribution for promotion of academic staff. This study found that social influence was not a key determinant of use of new media in scholarly communication. Social influence is defined as ‘the degree to which an individual perceives that important others believe he or she should use a new technology’ (Venkatesh *et al.* 2003). This finding shows that academic staff do not believe that important others; including their universities, colleagues and even regulators like CUE, expect them to use new media in scholarly communication. Social influence is defined as ‘the degree to which an individual perceives that important others believe he or she should use a new technology’ (Venkatesh *et al.* 2003).`

4. Universities and other stakeholders in the higher education sector should help to cultivate a positive attitude towards using media technologies in scholarly communication. This study observed that academic staff who had a positive attitude towards new media were likely to use such media in their scholarly communication unlike those who recorded a negative attitude. To create such a positive attitude, universities and other institutions which publish across new media platforms should find mechanisms that will enhance adherence to strict quality guidelines of new media scholarly publications through appropriate peer review. Studies have shown that many authors have a poor attitude towards many new media platforms because a number are known to have poor peer review mechanisms and quite often, work published through such platforms is of poor academic quality (Ilieva & Chakava, 2016). New media academic publications should be subjected to strict peer review mechanisms as other academic publications to attain quality and academic respect.
5. University departments as well as individual lecturers should initiate academic discourse through academic blogs and social media platforms to actively engage with online audiences on their research initiatives while at the same time seeking collaborations with other scholars who are already engaged in similar initiatives

across the world. This study found that apart from online publications, other new media platforms were scarcely used for scholarly communication, yet they could be valuable in collaborating with other scholars and institutions across the world. For instance, academic blogs on various research topics can help to keep in touch with online audiences and disseminate information on on-going research and other academic activities. Academic blogs are a more informal platform that can be used to present an argument that builds on personal perspectives. These blogs can take the form of textual analysis, personal experiences of academics, current events or responses to specific questions. Already, academic blogs like The Thesis Whisperer, The Research Whisperer, Writing for Research, Piled Higher and Deeper (PhD), etc, have been very successful in America.

### **5.6 Recommendations for Further Research**

This research was undertaken in five public universities which listed highest in both the Webometrics (2017) and the INASP (2012) rankings of universities based on research output, among other considerations. The study only covered five variables; performance expectancy, effort expectancy, social influence, facilitating conditions and personal factors. The study has opened up areas for further research. The areas recommended for further research would provide opportunities for investigating and finding more knowledge. Consequently, the following areas have been recommended for further study;

- i. A study should be done to find out the effectiveness of new media tools in assessment of journal impact factors for university-based journals in Kenya.
- ii. A comparative investigation should be conducted to find out whether there is any significant difference in use of new media in scholarly communication by lecturers in public universities as opposed to those in private universities.
- iii. A study should be conducted on the influence of new media in enhancing access to scholarly literature from Kenyan universities by the intended users of the knowledge.

- iv. A study should also be carried out on the determinants of use of new media in scholarly communication by post-graduate students in Kenyan universities.
- v. A study should also be carried out to investigate the extent to which lecturers in Kenyan universities have embraced social academic media platforms to connect with their peers in the developing world in on ongoing scholarly communication endeavours.

## REFERENCES

- African Journals Online, (2014). List of African journals. Available at <http://www.ajol.info/index.php/index/browse/category>
- Akbar, F. (2013). What affects acceptance and use of technology? Dietrich College Honours Thesis. Carnegie Mellon University.
- Al-Aufi, A.S. & Fulton, S. (2015). Impact of social networking tools on scholarly communication: A cross-institutional study. *The Electronic Library*, 33(2), 224-241.
- Alaiad, A.& Zhou, L. (2014). The determinants of home health care robots adoption: An empirical investigation. *International journal of Medical Informatics*, 83, 825-840.
- Alharbi, S. & Drew, S. (2014). Using the technology acceptance model in understanding academics' behavioural intention to use Learning Management Systems. *International Journal of Advanced Computer Science and Applications*, 5(1), 142-155.
- Anderson-Wilk, M. & Hino, J. (2011). Achieving rigor and relevance in online multimedia scholarly publishing. *First Monday Peer Reviewed Journal on the Internet*, 16 (12), 5<sup>th</sup> December, 2011.
- Arman, A.A., & Hartati, S. (2015). Development of user acceptance model for Electronic Medical Record System. *International Conference on Information Technology Systems and Innovation*, Bandung: Indonesia.
- Atkinson, L. N. (2012). *Developing a questionnaire to measure perceived attributes of e-health innovations*. Washington: Publishing Technology.
- Babbie, E. R. (2011). *The Basics of Social Research* (5<sup>th</sup> ed.) Belmonte, Australia: Cengage Learning.
- Bai, J. & Perron, P. (1998). Estimating and testing linear models with multiple structural changes. *Econometrica*, 1998.
- Bailey, K.D. (1987). *Methods of Social Research*. 3rd Edition. Free Press, New York.

- Basheer, A. A. (2010). Measuring the acceptance and adoption of E-Learning by academic staff. *Knowledge Management & E-Learning: An International Journal*, 3(2), 201-221. Retrieved on 12<sup>th</sup> October 2017 from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.705.2780&rep=rep1&type=pdf>
- Beer, D. (2008). Social network(ing) sites ... revisiting the story so far: a response to Danah Boyd & Nicole Ellison. *Journal of Computer-Mediated Communication*, 13 (2), 516-529.
- Bennani, Az-E., Oumlil, R. & Grenier, E. (2014). Human factors influencing the intention of ICT appropriation by healthcare practitioners: A survey in public centres in Agadir City, South of Morocco. *Journal of North African Research in Business*, 20 (2014), Article ID 607571, DOI: 10.5171/2014.607571
- Benedict, A. (2016). Comparing the Hosmer-Lemeshow Goodness of Fit Test with Varying Number of Groups to the Calibration Belt in Logistic Regression Models. Ohio, USA: The Ohio State University. Retrieved from [https://etd.ohiolink.edu/!etd.send\\_file?accession=osu1469186992&disposition=inline](https://etd.ohiolink.edu/!etd.send_file?accession=osu1469186992&disposition=inline)
- Bgoya, W. (2007). Scholarly publishing – an overview. In A. Mlambo (2007). *African scholarly publishing essays*. African Books Collective & INASP; Oxford, 1-10.
- Bhattacharjee, A. (2012). *Social Science Research: Principles, Methods, and Practices*. Florida: University of South Florida. Retrieved from <https://open.umn.edu/opentextbooks/BookDetail.aspx?bookId=79>
- Bird, D. K. (2009). The use of questionnaires for acquiring information on public perception of natural hazards and risk mitigation – A review of current knowledge and practice. *Natural Hazards Earth System Sciences*, 9, 1307–1325. Copernicus Publications, Australia.
- Bjork, B. C. (2004). Open access to scientific publications – an analysis of the barriers to change. *Information Research – An International Electronic Journal*, 9 (2).

- Bjork, B. C. (2007). A model of scientific communication as a global distributed information system. *Information Research – An International Journal*, 12 (2).
- Borg, W. R., & Gall, M. D. (2003). *Educational Research: An Introduction* (Fifth ed.). New York: Longman.
- Bryman, (2012). *Social Science Research Methods*. (4<sup>th</sup> ed). New York Oxford University press.
- Chakava, H. (2007). Scholarly publishing in Africa: the perspective of an East African commercial and textbook publisher. In A. Mlambo (ed) (2007). *African scholarly publishing*, pp. 66-75, Hans Zell Publishing; Lochcarron, Scotland.
- Chakava, H. M. (2012). Scholarly publishing as a bridge to Kenya's Vision 2030. *International Journal of Professional Studies*; 3 (3), 283-291.
- Chang, M. K., & Cheung, W. (2001). Determinants of the intention to use Internet/WWW at Work: A confirmatory study. *Information and Management*, 39(1),1–14.
- Cohen, L., Manion, L. & Morrison, K. (2011). *Research Methods in Education*. London: Routledge.
- Cohen, L., Morrison, K., & Manion, L. (2007). *Research Methods in Education*. London: Routledge.
- Commission for University Education. (2014). *Universities Standards and Guidelines 2014*. Retrieved on 22<sup>nd</sup> December, 2014 from <http://www.cue.or.ke/images/phocadownload/university%20regulations%202014.pdf>
- Commission for University Education. (2017). Accredited universities in Kenya. Retrieved from [http://www.cue.or.ke/images/phocadownload/Accredited\\_Universities\\_Kenya\\_Nov2015.pdf](http://www.cue.or.ke/images/phocadownload/Accredited_Universities_Kenya_Nov2015.pdf)
- Compeau, D.R. & Higgins, C.A., (1995). Computer self-efficacy: development of a measure and initial test. *MIS Quarterly*, 19(2), 189–211. doi: 10.2307/249688[CrossRef], [Web of Science ®], [Google Scholar].



- Correia, A. M. R. & Teixeira, J. C. (2005). Reforming scholarly publishing and knowledge communication. *Online Information Review*, 19 (4), 349-364. Retrieved on 20<sup>th</sup> November, 2015 from <http://dx.doi.org/10.1108/14684520510617802>
- Costa, S. & Meadows, J. (2000). The impact of computer usage on scholarly communication among social scientists. *Journal of Information Science*, 26(4), 255-262.
- Creswell, J. W. (2005). *Educational research (2<sup>nd</sup> ed.). Planning, conducting, and evaluating quantitative and qualitative research*. NJ: Pearson.
- Creswell, J. W. (2007). *Qualitative inquiry and research design (2<sup>nd</sup> Ed.)*. Choosing among five traditions. Thousand Oaks: Sage.
- Creswell, J. W. (2014). *Research design: qualitative, quantitative, and mixed method approaches (4<sup>th</sup> ed.)*. Thousand Oaks. Thousand Oaks: Sage Publications Ed.
- Creswell, J.W. (2009). *Research design: qualitative, quantitative, and mixed methods approaches (3<sup>rd</sup> ed.)*. Thousand Oaks, CA: Sage Publications.
- Creswell, J. W. (2015). *Educational Research: Planning, Conducting and Evaluating Quantitative and Qualitative Research (5th ed.)*. Boston, MA: Pearson.
- Creswell, J. W. (2015). *A Concise Introduction to Mixed Methods Research*. London, SAGE Publications.
- Darko-Ampem, K.O. (2003). Scholarly publishing in Africa: A case study of the policies and practices of African university presses. PhD. Thesis. Retrieved on 12<sup>th</sup> December, 2017 from <http://storre.stir.ac.uk/bitstream/1893/71/18/Darko-Ampem-thesis-2004.pdf>
- Davis, F.D., Bagozzi, R.P. & Warshaw, P.R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, 35 (8), 982–1002. doi: 10.1287/mnsc.35.8.982[CrossRef], [Web of Science ®], [CSA], [Google Scholar]
- Dodge, Y. (2003). *The Oxford dictionary of statistical terms*. OUP.
- Dogoriti, E.; Pange, J. & Anderson, S. G. (2014). The use of social networking and learning management systems in English language teaching in higher

- education. *Campus-Wide Information Systems*, 31(4), 254-263, DOI: <https://doi.org/10.1108/CWIS-11-2013-0062>
- Domnez, D. (2012). *Social science methods for empirical data collection and analysis course guideline*. Zurich: Swiss Federal Institute of Technology.
- Dunn, K. (2005). *Interviewing, in qualitative research methods in Human Geography*. Oxford University Press: Australia.
- Dupagne, M. & Driscoll, P. (2005). *First phase of a scale development project to measure perceived attributes of consumer communication technologies*. Paper presented at the annual meeting of the *International Communication Association*, Sheraton New York, New York.
- Eager, B. & McCall, C. (1999). *The complete idiot's guide to online marketing*. Que: A Division of Macmillan: Indianapolis.
- Ean, C. L. (2010). Face-to-face Vs. computer mediated communication: Exploring employees' preferences of effective employee communication channel. *International Journal of Advancement of Science and Arts*, 1 (2). Retrieved on 7<sup>th</sup> Jan, 2015 from [http://www.academia.edu/538403/Face-to-face\\_Versus\\_Computer\\_mediated\\_Communication\\_Exploring\\_Employees\\_Preference\\_of\\_Effective\\_Employee\\_Communication\\_Channel](http://www.academia.edu/538403/Face-to-face_Versus_Computer_mediated_Communication_Exploring_Employees_Preference_of_Effective_Employee_Communication_Channel)
- Edwards, A. L. & Kenny, K. C. (1996). "A comparison of the Thurstone and Likert techniques of attitude scale construction". *Journal of Applied Psychology*, 30, 72-83.
- Ellys, T. J. & Levy, Y. (2009). Towards a guide for novice researchers on research methodology: review and proposed methods. *Issues in Informing Science and Information Technology. Volume 6*. Oxford University Press: Australia.
- Ezema, I. J. (2009). Journal impact factors and the crisis of scholarly communication in Africa: the dilemma of Nigerian academics. *Library Review*. 59 (5), 350-359.
- Flipsen, J. (2013). Publishing of scientific research on the rise in Kenya. Proceedings of the workshop on publishing scientific research. JKUAT, June, 5<sup>th</sup> 2013. Retrieved

- from <http://www.jkuat.ac.ke/publishing-of-scientific-research-on-the-rise-in-kenya/>
- Fonsnacht, K. (2013). Undergraduate coping with financial stress: A latent class analysis. Retrieved from [https://www.researchgate.net/publication/318790672\\_Undergraduate\\_Financial\\_Stress\\_Financial\\_Self-Efficacy\\_and\\_Major\\_Choice\\_A\\_Multi-Institutional\\_Study](https://www.researchgate.net/publication/318790672_Undergraduate_Financial_Stress_Financial_Self-Efficacy_and_Major_Choice_A_Multi-Institutional_Study)
- Fuller, M., Robert, V. C. & Brown, A. S. (2006). E-learning and individual characteristics: The role of computer anxiety and communication apprehension. *Journal of Computer Information Systems*, 46, 103–115.
- Gakuu, C. (2006). Analysis of the Factors and Attitudes that Influence Lecturers' Readiness to adopt ICT in Teaching. The case of University of Nairobi. Nairobi, Kenya: University of Nairobi.
- Gichora, F.G. & Kwanya T. (2015). “The impact of Web 2.0 tools on academic libraries in Kenya”. *International Journal of Library and Information Science*, 7(2), 21-26.
- Gillham, B. (2010). *Research Methods*. USA: Bloomsbury Publishing PLC. Retrieved from <https://ebookcentral.proquest.com/>
- Gingery, T. (2009). Survey data analysis: Descriptive vs. inferential statistics. Retrieved on 19<sup>th</sup> March, 2015 from <http://survey.cvent.com/blog/market-research-design-tips-2/survey-data-analysis-descriptive-vs-inferential-statistics>
- Glasgow, P.A. (2005). *Fundamentals of survey research methodology*. Retrieved on 13<sup>th</sup> Nov. 2014 from [http://www.mitre.org/work/tech\\_papers\\_05/05-0638/05\\_0638.pdf](http://www.mitre.org/work/tech_papers_05/05-0638/05_0638.pdf).
- Government of Kenya (2007). *Kenya Vision 2030*. Available at [www.vision2030.go.ke](http://www.vision2030.go.ke)
- Graham, T. W. (2000). Scholarly communication. *Serials*, 13 (1), 3-11.
- Granger, C. & Tera, M. J. (2007) Some properties of time series data and their use in econometric model specification. *J Econometrics* 16(6): 121–130
- Griffin, E. M. (2012). A First Look at Communication Theory (8<sup>th</sup> ed). Wheaton College: McGraw Hill.

- Gu, F. & Widen-Wulff, G. (2011). Scholarly communication and possible changes in the context of social media: A Finnish case study. *The Electronic Library*, 29 (6), 762-776.
- Gudo, C. O., Olel, M. A. & Oanda, I. O. (2011). University expansion in Kenya and issues of quality education: challenges and opportunities. *International Journal of Business and Social Science*; 20 (20), 203-214.
- Hahn K.L. (2008). Research Library Publishing Services: New options for university publishing. Association of Research Libraries: Washington DC. Retrieved on 12<sup>th</sup> December 2017 from <http://www.arl.org/storage/documents/publications/research-library-publishing-services-mar08.pdf>
- Horowitz, F. & Curtis, R. B. (1995). The impact of technology on scholarly publishing. *The Journal of Scholarly Publishing*, April, 1995, 211-228.
- Houghton, J. et al. (2009). *Economic implications of alternative scholarly publishing models: exploring the costs and the benefits*. Loughborough University.
- Hung, S. Y., Ku, C. Y. & Chang, C. M. (2002). Empirical Test of the WAP Adoption Model. working paper. Department of Information Management, National Chung Cheng University, Chia-Yi.
- Ikoja-Odongo, J.K. (2009). Publishing in Uganda: With notes from Africa. Kampala.
- Ilieva, E. & Chakava, H.M. (2016). East African publishing and the academia. In K. Kiarie & K. Mitambo. (2016). *Coming of Age: Strides in African Publishing*, 106-128. Nairobi: EAEP.
- INASP. (2012). Scientific development in African countries: a scientific approach 1996-2009. Project report. Retrieved on 25<sup>th</sup> February, 2014 from: [http://www.inasp.info/uploads/filer\\_public/2013/06/20/scientific\\_development\\_in\\_african\\_countries.pdf](http://www.inasp.info/uploads/filer_public/2013/06/20/scientific_development_in_african_countries.pdf)
- Jenkins, H. & Thornburn, D. (eds). (2004). *Democracy and new media*. Cambridge, MA: MIT Press.

- Kamau, S. (2013). The Influence of Social Networking Sites on Political Attitudes and Behaviour among Urban Youth in Kenya. Nairobi: University of Nairobi.
- Keeler, C. M., & R. Anson. (1995). An Assessment of cooperative learning used for basic computer skills instruction in the college classroom. *Journal of Educational Computing Research*, 12(4), 379– 393.
- KENET. (2009). *E-readiness Survey of East African Universities*. Nairobi, Kenya. KENET. Retrieved from <https://ereadiness.kenet.or.ke/s>
- Kenya National Library Services. (2014). Kenya periodicals directory. Retrieved from <http://www.knls.ac.ke/national-library/kenya-periodicals-directory>
- Kenya Publishers Association. (2014). Members list. Retrieved from <http://www.kenyapublishers.org/our-members>
- Kerlinger, F. & Lee, H. (2000). *Foundations of behavioural research (4<sup>th</sup> ed.)*. Harcourt College Publishers, TX.
- Kim, Y. J., Chun J. U. & Song, J. (2005). Investigating the role of attitude in technology acceptance from an attitude strength perspective. Retrieved on 12<sup>th</sup> October 2017 from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.484.6356&rep=rep1&type=pdf>
- Kiura, S. (2012). Use of ICT in Research, Education, Development and Innovation: An overview of Challenges, Opportunities and Potentials. *International Journal of Professional Practice*, 3(3), 237 –241.
- Kleijnen, M., Wetzels, M. & de Ruyter, K. (2004). Consumer acceptance of wireless finance. *Journal of Financial Services Marketing*, 8, 206–217.
- Kline, R. B. (2015). *Principles and practice of structural equation modelling*. London: Guilford Publications
- Kothari, C. R. (1990). *Research methodology: Methods and techniques*. 2<sup>nd</sup> Ed. Wishwa Prakashan. pp 104-107.

- Kothari, C.R. (2004). *Research methodology: methods and techniques*. New Delhi: New Age International Publishers.
- Kromberg, S. (2000). How digital technologies are transforming book publishing. In N. Evans & N. Seeber (2000). *The politics of publishing in South Africa* (pp 259-278). London: Holger Ehling Publishing Ltd.
- Kumar, R. (2011). *Research Methodology. A step-by-step guide for beginners*. USA, Los Angeles: SAGE Publishers. Retrieved from <https://us.sagepub.com/en-us/nam/research-methodology/book240599>
- Lagat, J. K. (2012). *Research publishing in Kenya*. Sasa Sema Publications: Nairobi.
- Logan, R.K. (2010). *Understanding new media: Extending Marshal McLuhan*. London: Peter Lang Publishers.
- Lor, P. J. (2007). Bridging the North-South divide in scholarly communication in Africa – a library and information science perspective. *IFLA Journal*, 33 (4), 303-12, available at: [www.ifla.org](http://www.ifla.org) (accessed 10<sup>th</sup> August, 2014).
- Mahmood, I., Hartley, R. & Rowley, J. (2011). Scientific communication in Libya in the digital age. *Journal of Information Science*, 37(4), 379-390.
- Marumbwa, J. (2014). Exploring the moderating effects of socio-demographic variables on consumer acceptance and use of mobile money transfer services (MMTs) in Southern Zimbabwe. *American Journal of Industrial and Business Management*, 4, 71-79. Available at (<http://www.scirp.org/journal/ajibm>) <http://dx.doi.org/10.4236/ajibm.2014.42011>
- Mazrui, A. A. (2005). "Pan-Africanism and the Intellectuals: Rise, Decline and Revival," in Thandika Mkandawire, ed. *African Intellectuals: Rethinking Politics, Language, Gender and Development*. Dakar, London and New York: CODESRIA Books and Zed Books, 56-77.
- Meadows, J. (2003). *Scholarly communication*. Rutledge: London.
- Metcalf, A.S. & Esseh, S. (2009). International development and research capacities: increasing access to African scholarly publishing. *Canadian Journal of Higher Education*, 39 (3), 89-109.

- Mlambo, A. (2007). Scholarly publishing – an overview. In *Scholarly publishing in Africa*. Africa Institute of South Africa; Pretoria, 11-26.
- Moore, G.C. & Benbasat, I., (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 2 (3), 192–222. doi: 10.1287/isre.2.3.192[CrossRef], [Web of Science ®], [Google Scholar]
- Morris, M.G. & Venkatesh, V. (2000). Age differences in technology adoption decisions: Implications for a changing workforce. *Personnel Psychology*, 53, 375-403.
- Mugenda, O. & Mugenda, J. (2003). *Research methods: quantitative and qualitative approaches*. Nairobi: ACTS.
- Mukherjee, B. (2009). Scholarly Communication: A Journey from Print to Web. Library Philosophy and Practice. Available at [https://www.researchgate.net/publication/28322338\\_Scholarly\\_Communication\\_A\\_Journey\\_from\\_Print\\_to\\_Web](https://www.researchgate.net/publication/28322338_Scholarly_Communication_A_Journey_from_Print_to_Web)
- Nachmias, F. & Nachmias, D. (1996). *Research methods in the social sciences*. New York: St. Martins Press.
- Ndavula, J. (2018). *Social Media and Political Campaigns in Kenya: An Examination of the Influence of Digital Networking Technologies on Election Processes*. Borderless Press.
- Ngobeni, S. A. (2010). Scholarly publishing in South Africa. In *Scholarly publishing in Africa*, Africa Institute of South Africa; Pretoria, 69-82.
- Nkatha, M.G., Kimwele, M. & Okeyo G. (2015). “The use of social networking sites for learning in institutions of higher learning”. *International journal of Scientific & Technology Research*, 4(12), 51-56.
- Nunnally, J. C. & Bernstein, I. H. (1994). *Psychometric theory*. New York: McGraw-Hill.
- Nyandemo, S. M. (2007). *Research methodology: Methods and approaches*. Nairobi.

- Nyerere, J. (2016). Open and Distance learning in Kenya. A Baseline Report Commissioned by Commonwealth of Learning. Kenya Retrieved from <http://oasis.col.org/handle/11599/2491>
- Nyerere, K. A., Gravenir F. Q. & Mse, G. S. (2012). Delivery of open, distance and e-learning in Kenya. *International Review of Research in Open and Distance Learning*, 13 (3), 184-203. Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/1120/2203>
- Ocholla, D. N. & Ocholla, L. (2007). Research in library and information science in South Africa: an analysis of journal research output from 1993-2006. Paper presented at the World Library and Information Congress: 73<sup>rd</sup> IFLA General Conference and Council, 19-23 August, Durban South Africa, available at: [www.ila.org/iv/ifla73](http://www.ila.org/iv/ifla73).
- Olukoju, A. (2004). The crisis of research and academic publishing in Nigerian universities. In P.T. Zeleza and A. Olukoshi, (Eds). *Africa Universities in the Twenty-First Century*, Vol 2, CODESRIA, Dakar, pp. 363-75.
- Omwenga, E. (2016). Pedagogical Issues and E-learning Cases: Integrating ICTs into Teaching and Learning process. University of Nairobi. Retrieved from <https://www.researchgate.net/>
- Omwoha, J. & Gakahu, N. (2010). *Scholarly publishing in the 21<sup>st</sup> century and its role in national development: a focus on Kenya*. Downloaded on 13/4/2012 from <http://www.google.co.ke/#hl=sw&site=&source=hp&q=SHOLARLY+PUBLISHING+IN+THE+21ST&oq>
- Owens, L.K. (2002). Introduction to survey research design: SRL Fall 2002. *Seminar series*. Retrieved from <http://www.srl.uic.edu>.
- Phichitchaisopa, N., & Naenna, T. (2013). Factors affecting the adoption of healthcare information technology. *EXCLI Journal*, 12, 413-436. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4566918/pdf/EXCLI-12-413.pdf>



- Plouffe, C.R., Hulland, J.S. & Vandenbosch, M. (2001). Research report: Richness versus parsimony in modelling technology adoption decisions – Understanding merchant adoption of a smart card-based payment system. *Information System Research*, 12(2), 208-222. doi: 10.1287/isre.12.2.208.9697
- Procter, *et al.* (2010). “Adoption and use of Web 2.0 in scholarly communication: Philosophical transactions of the Royal Society”. *A Mathematical, Physical and Engineering Sciences*, 368(1926), 039-56.
- Quarshie, GNK – V. & Oisefuah E. K. (2010). The crisis of scholarly publishing in Africa. In *Scholarly publishing in Africa*, Africa Institute of South Africa; Pretoria, 11-26.
- Rao, M. K. (2001). Scholarly communication and electronic journals. *Library Review*. 50 (4).169-175.
- Republic of Kenya. (2006). Sessional paper No 1 of 2005 on Policy framework for Education Training and Research. Government of Kenya Press. Retrieved from [www.idea-phd.net/images/doc-pdf/.../policy-framework-for-education-training.pdf](http://www.idea-phd.net/images/doc-pdf/.../policy-framework-for-education-training.pdf)
- Republic of Kenya. (2012). Sessional Paper No 1 of 2012: A Policy Framework for Education and Training in Kenya: MOEST. Retrieved from [www.tvetauthority.go.ke/.../Acts.../SESSIONAL\\_PAPER\\_%20No%2014%202012.pdf](http://www.tvetauthority.go.ke/.../Acts.../SESSIONAL_PAPER_%20No%2014%202012.pdf)
- Republic of Kenya. (2016). Economic Survey. Nairobi, Kenya: National Bureau of Statistics (KNBS). Retrieved from [www.devolutionplanning.go.ke/](http://www.devolutionplanning.go.ke/)
- Rogers, E. M. (1986). *Communications technology: The new media in society*. Free Press: New York.
- Rogers, E. M. (2003). *Diffusion of innovations (5th ed.)*. New York: Free Press.
- Rowlands *et al.*, (2011). “Social media use in the research workflow”. *Learned Publishing*, 24 (3), 158-175.
- Sarantakos, S. (2007). *A toolkit for quantitative data analysis*. Palgrave MacMillan, Hampshire, 118 -119.

- Sawant, S. (2012). Transformation of the scholarly communication cycle. *Library Hi Tech News*. 10, 21-24. Emerald Group Publishing.
- Stachewicz A. B. (2011). Measuring the perceived attributes of innovation: A study of capacitive switch technology in industrially designed user interface controls. Unpublished Masters Thesis, Eastern Michigan University.
- Stangor, C. (2011). *Research methods for behavioural sciences*, 4<sup>th</sup> ed. Belmont: Wardsworth; Cengage.
- Tashakkori A. & Creswell, J. (2007). Exploring the nature of research questions in mixed methods research. *Journal of Mixed Method Research*: 1, 198 -211.
- Thompson, R.L., Higgins, C.A. & Howell, J.M. (1991). Personal computing: Toward a conceptual model of utilization. *MIS Quarterly*, 15(1), 125-143. doi: 10.2307/249443
- Trotter, H., Kell, C., Willmers, M., Grey, E., Totolo, A. & King, T. (2014). Scholarly communication at the University of Botswana: Case study Report. *Scholarly Communication in Africa Programme*. Retrieved on 26<sup>th</sup> August 2015 at <http://www.scaprogramme.org.za>.
- Tung, S. C., & Chang, S. C. (2008). An empirical investigation of students' behavioural intentions to use the online learning course websites. *British Journal of Educational Technology*, 39(1), 71-83.
- UNESCO (2010). *UNESCO science report*. Retrieved on 11<sup>th</sup> Nov. 2014 from <http://unesdoc.unesco.org/images/0018/001899/189958e.pdf>
- UNESCO (2013). Technology, Broadband and Education. Advancing the Education for All Agenda: A Report by the Broadband Commission Working Group on Education. Paris - France: UNESCO. Retrieved from [unesdoc.unesco.org/images/0021/002196/219687e.pdf](http://unesdoc.unesco.org/images/0021/002196/219687e.pdf)
- UNESCO (2015). *UNESCO science report*. Towards 2030. Paris: UNESCO Publishing. Retrieved on 20<sup>th</sup> November, 2015 from <http://unesdoc.unesco.org/images/0023/002354/235406e.pdf>

- Venkatesh, V., Morris, M.G., Davis, G.B. & Davis, F.D., (2003). User acceptance of information technology: toward a unified view. *MIS Quarterly*, 27 (3), 425–478.
- Vrana, R. (2011). Transformation of scholarly publishing in the digital era: scholars' point of view. *Information Sciences and e-society*. Accessed on 12<sup>th</sup> February, 2014. Available at <http://infoz.ffzg.hr/INFuture/2011/papers/1-02%20Vrana,%20Tranformation%20of%20Scholarly%20Publishing%20in%20the%20Digital%20Era.pdf>
- Walsh, J. P., Kucker, S., Maloney, N.G. & Gabbay, S. (2000). Connecting minds: computer-mediated communication and scientific work. *Journal of the American Society for Information Science*, 51 (14), 1295-305.
- Wang, Y. S., Wang, Y. M., Lin, H. H. & Tang, T. I. (2003). Determinants of user acceptance of Internet banking: An empirical study. *International Journal of Service Industry Management*, 14, 501–519.
- Webometrics (2017). Ranking of universities for 2016. Available at <http://www.webometrics.info/en/Africa/Kenya%20>
- Werf-Davelaar, T. (2010). IISH Guidelines for preserving research data: a framework for preserving collaborative data collections for future research. Retrieved online from <https://www.surffoundation.nl/en/publications>
- Whiting, A. & Williams, D. (2013). Why people use social media: a uses and gratifications approach. *Qualitative Market Research: An International Journal*, 16 (4), 362-369, <https://doi.org/10.1108/QMR-06-2013-0041>
- Wood, T. J. (2009). *Gendered Lives: Communication, Gender, and Culture*, 8th Edition. Boston: Wadsworth (page 15-34).
- Xia, J. (2006). Scholarly communication in east and south-east Asia: Traditions and challenges. *IFLA Journal*, 32 (104), 104-112.

## **APPENDICES**

### **Appendix I: Introductory Letter**

#### **Determinants of Use of New Media in Scholarly Communication among Academic Staff in Public Universities in Kenya**

Dear Sir / Madam,

I am a student at Jomo Kenyatta University of Agriculture and Technology pursuing a PhD degree in Mass Communication. I am carrying out a research that aims to establish the determinants of use of new media in scholarly communication among academic staff in public universities in Kenya.

Your institution has been purposively selected to participate in this survey. You have been purposely selected to participate in this study because as a lecturer, you are often involved in scholarly communication in your day-to-day activities. The findings of the study will inform and guide university managers and policy makers on the need to upscale the use of new media technologies in scholarly communication by providing the relevant resources. You are kindly requested to provide information to be used in the research. Please note that the information you provide will be treated with utmost confidentiality and will only be used for the purpose of the study.

Do not write your name or any other details that may in any way reveal your identity. The researcher will be willing to share the results of the study with you.

The study has been approved by the National Commission for Science, Technology & Innovation under permit number **NACOSTI/P/16/38529/10080**. Thank you in advance for your cooperation.

Masaya Hillary Chakava

## Appendix II: Questionnaire for Lecturers

### Section A: Background Information

**Tick where appropriate or provide the needed information in the spaces provided.**

1. Age

Below 30 yrs ☐ 31 - 40yrs ☐ 41 - 50yrs ☐ 51 - 60yrs ☐ 61yrs and over ☐

2. Gender      Male ☐      Female ☐

3. Indicate your University?

a. University of Nairobi ☐    b. Egerton University ☐    c. Kenyatta University ☐    d. Moi University ☐    e. JKUAT ☐

4. What is your current position at the university?

Full professor ☐      Associate Professor ☐

Senior Lecturer ☐      Lecturer ☐

Assistant lecturer/Tutorial Fellow ☐      Teaching Assistant ☐

Part-time lecturer ☐

Other (please specify) \_\_\_\_\_

5. Highest Level of Education.

Undergraduate ☐      Masters ☐

PhD ☐      Post-Doctorate ☐

Others \_\_\_\_\_ (please specify) \_\_\_\_\_

### SECTION B: INVOLVEMENT IN SCHOLARLY COMMUNICATION

1. a. Please indicate whether you have been involved in any of the following forms of scholarly communication over the past five years (2011-2016):

Activity	Number of Publications (2011-2016) Tick where applicable				
	0	1-2	3-5	6-9	>10
Publication of journal paper					

Published book					
Published book chapter					
Presented conference paper					
Served as journal editor					
Served as peer reviewer					

b. In what format were the publications in 1(a) above issued?

Print ☐ Electronic publication format ☐ Both in print and electronic format ☐

## 2. New Media Tools Preferred for Scholarly Communication

How frequently do you use each of the new media tools listed in the table below in your scholarly communication activities? (Tick only one choice for each statement.)

**Note** 1= Very Frequent, 2 = Frequent, 3 = Fairly Frequent, 4 = Less Frequent and 1 = Never.

New Media Tool	1	2	3	4	5
1. Online publishing					
2. Multimedia Sharing					
3. Social Networks					
4. Tagging					
5. Wikis					
6. Rich Site Summary (RSS)					
7. Miniblogs					
8. Blogs					

## 3. Performance Expectancy of New Media in Scholarly Communication.

For each of these statements, please tick one choice to indicate whether you agree on a scale of 1-5 where: 1= Strongly Disagree, 2= Disagree, 3 = Not Sure, 4 = Agree, 5 = Strongly Agree.

Performance Expectancy of new media in scholarly communication	1	2	3	4	5
--	---	---	---	---	---

1. I find new media useful in my scholarly communication.					
2. Using new media enables me to accomplish my scholarly communication tasks more quickly					
3. Using new media increases my scholarly communication productivity					
4. Using new media improves the quality of my scholarly communication.					
5. Using new media enables me to publish more scholarly work than would otherwise be possible.					

#### 4. Effort Expectancy of New Media in Scholarly Communication.

For each of these statements, please tick one choice to indicate whether you agree on a scale of 1-5 where: 1= Strongly Disagree, 2= Disagree, 3 = Not Sure, 4 = Agree, 5 = Strongly Agree.

Effort Expectancy of new media tools in scholarly communication	1	2	3	4	5
1. My interaction with new media in my scholarly communication work is clear and understandable					
2. It has been easy for me to become skilful in using new media in my scholarly communication					
3. Learning to use new media in scholarly communication was easy for me					
4. Overall, I find new media easy to use in my scholarly communication.					

### 5. Attitude towards using new media technologies in scholarly communication

For each of these statements, please tick one choice to indicate whether you agree on a scale of 1-5 where: 1= Strongly Disagree, 2= Disagree, 3 = Not Sure, 4 = Agree, 5 = Strongly Agree.

Attitude towards adoption of new media in scholarly communication	1	2	3	4	5
1. Using new media in scholarly communication is a good idea					
2. New media makes scholarly communication very interesting					
3. Working with new media in my scholarly communication is fun					
4. I like working with new media in my scholarly communication					

### 6. Social Influence

For each of these statements, please tick one choice to indicate whether you agree on a scale of 1-5 where: 1= Strongly Disagree, 2= Disagree, 3 = Not Sure, 4 = Agree, 5 = Strongly Agree.

Social influence towards adoption of new media	1	2	3	4	5
1. My colleagues using new media in scholarly communication have liked it					
2. People who are important to me think that I should use new media in my scholarly communication work					
3. My colleagues think that I should use new media in my scholarly communication tasks					
4. In general, my university expects that I should use new media in my scholarly communication tasks.					

### 7. Facilitating Conditions of New Media Use for Scholarly Communication.

For each of these statements, please tick one choice to indicate whether you agree on a scale of 1-5 where: 1= Strongly Disagree, 2= Disagree, 3 = Not Sure, 4 = Agree, 5 = Strongly Agree.



Facilitating conditions for use of new media in scholarly communication	1	2	3	4	5
1. My university has enough computers to support the use of new media in scholarly communication					
2. My university has installed sufficient internet bandwidth to support scholarly communication					
3. There are adequate trained technical staff who support us in using new media in scholarly communication					
4. Faculty are sufficiently trained on using new media in scholarly communication					
5. The cost of acquiring new media communication technologies for use in scholarly communication is too high.					
6. I have the financial resources to purchase new media technologies for my scholarly communication.					
7. Overall, I believe I have enough resources to support my use of new media in my scholarly communication.					

## 8. Anxiety

For each of these statements, please tick one choice to indicate whether you agree on a scale of 1-5 where: 1= Strongly Disagree, 2= Disagree, 3 = Not Sure, 4 = Agree, 5 = Strongly Agree.

Anxiety on use of new media in scholarly communication	1	2	3	4	5
1. I hesitate to use new media in my scholarly communication work for fear of making mistakes					
2. I fear losing control of my scholarly work when I use it with new media technologies					

3. I feel anxious about using new media technologies in my scholarly communication					
4. I find new media technologies somewhat intimidating for my use in scholarly communication.					

THANK YOU

### **Appendix III: Initial Scale Items Based of the Original Work of Venkatesh et al (2003)**

#### **Performance expectancy**

- i. I find the system useful for the course.
- ii. Using the system will enable me to accomplish tasks more quickly.
- iii. Using the system will increase my productivity.
- iv. If I use the system, I will increase my chances of getting a high grade.

#### **Effort expectancy**

- i. My interaction with the system will be clear and understandable.
- ii. It will be easy for me to become skilful at using the system.
- iii. I find the system easy to use.
- iv. Learning to operate the system is easy for me.

#### **Attitude toward using technology**

- i. Using the system is a good idea.
- ii. The system will make work more interesting.
- iii. Working with the system is fun.
- iv. I like working with the system.

#### **Social influence**

- i. People who are important to me think that I should use the system.
- ii. People who influence my behaviour think that I should use the system.
- iii. The senior management of this business has been helpful in the use of the system.
- iv. In general, the organization has supported the use of the system.

#### **Facilitating conditions**

- i. I have the resources necessary to use the system.
- ii. The system is not compatible with other systems I use.
- iii. I have the knowledge necessary to use the system.
- iv. A specific person (or group) is available for assistance with system difficulties.

#### **Self-efficacy**

- i. I could complete a job or task using the system...

- ii. If there was no one around to tell me what to do as I go.
- iii. If I could call someone for help if I got stuck.
- iv. If I had a lot of time to complete the job for which the software was provided.
- v. If I had just the built-in help facility or assistance.

**Anxiety**

- i. I hesitate to use the system for fear of making mistakes I cannot correct.
- ii. It scares me to think that I could lose a lot of information using the system by hitting the wrong key.
- iii. I feel apprehensive (anxious) about using the system.
- iv. The system is somewhat intimidating to me.

Source: Akbar, 2013

## Appendix IV: Research Permit


**THIS IS TO CERTIFY THAT:**

**MR. HILLARY MASAYA CHAKAVA**  
**of JOMO KENYATTA UNIVERSITY OF**  
**AGRICULTURE AND TECHNOLOGY,**  
**13357-200 Nakuru, has been permitted**  
**to conduct research in Nairobi, Nakuru**  
**Counties**  
**on the topic: ADOPTION AND USE OF**  
**NEW MEDIA IN SCHOLARLY**  
**COMMUNICATION AMONG UNIVERSITY**  
**ACADEMIC STAFF IN SELECTED PUBLIC**  
**UNIVERSITIES IN KENYA**  
**for the period ending:**  
**13th April, 2017**

**Permit No.: NACOSTI/P/16/38529/10080**  
**Date Of Issue : 13th April, 2016**  
**Fee Received : ksh 2000**

**Applicant's Signature**

**Director General**  
**National Commission for Science, Technology & Innovation**



## Appendix V: Approval Letter from JKUAT



### JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

#### DIRECTOR, BOARD OF POSTGRADUATE STUDIES

P.O. BOX 62000  
NAIROBI - 00200  
KENYA  
Email: director@bps.jkuat.ac.ke

TEL: 254-067-52711/52181-4  
FAX: 254-067-52164/52030

REF: BPS/HD421-1552/2013

04<sup>th</sup> January, 2016

Mr. Hillary Masaya Chakava  
C. /o SCDS  
JKUAT


Dear Mr. Masaya,

**RE: APPROVAL OF RESEARCH PROPOSAL AND SUPERVISORS**

Kindly note that your research proposal entitled: "*Adoption of new Media in Scholarly Communication among University academic staff in Kenya's Public Universities.*" has been approved. The following are your approved supervisors:-

1. Dr. Hellen K. Mberia
2. Dr. George M. Gatero

Yours sincerely

  
**PROF. MATHEW KINYANJUI**  
**DIRECTOR, BOARD OF POSTGRADUATE STUDIES**  
Copy to: Dean, SCDS



JKUAT is ISO 9001:2008 and 14001:2004 Certified  
Setting Trends in Higher Education, Research and Innovation

**Appendix VI: Original Scores of Variables before Recoding**

		Frequency in two categories only	
		Low use	High use
sa2 Gender	Male	38	38
	Female	28	26
sa1 Age	<30	1	8
	31-40	13	18
	41-50	23	14
	51-60	21	19
	61-70	8	5
sa3 University	University of Nairobi	21	29
	Egerton University	10	7
	Kenyatta University	11	10
	Moi University	18	15
	JKUAT	6	3
sa4 Current Position in the University			
	Part-time lecturer	5	5
	Teaching Assistant	0	4
	Assistant Lecturer	3	11
	Lecturer	31	23
	Senior Lecturer	16	10
	Associate Professor	9	10
	Professor	2	1
level of performance expectancy	low	26	6
	average	19	6
	high	21	52
level of effort expectancy	low	31	11
	average	21	16
	high	14	37

level of social influence	low	32	16
	average	21	20
	high	13	28
level of influence of facilitating conditions	low	40	34
	average	23	23
	high	3	7