

**APPLICATION OF WEB 2.0 TOOLS TO ENHANCE KNOWLEDGE MANAGEMENT**

**PRACTICES IN ACADEMIC LIBRARIES IN TANZANIA**

**BY**

**NEEMA FLORENCE MOSHA**

**(Student No.: 50777246)**

**Submitted in accordance with the requirements  
for the degree of**

**DOCTOR OF PHILOSOPHY AND LITERATURE**

**in the subject of**

**INFORMATION SCIENCE**

**at the**

**UNIVERSITY OF SOUTH AFRICA, PRETORIA**

**SUPERVISOR: PROF. PATRICK NGULUBE**

**CO-SUPERVISOR: PROF. EDDA T. LWOGA**

**FEBRUARY 2017**

## **SUMMARY**

The emergence of Web 2.0 tools has transformed the operation of Knowledge Management (KM) practices in the academic libraries. **This study has investigated the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania.** Eight out of twelve academic libraries located in public universities in Tanzania were purposively selected in this study. The study included two categories of respondents: ordinary library staff and senior library staff (directors, heads of libraries, library managers, and Information and Technology (IT) specialists in the library etc).

The findings of the study were determined after applying methodological triangulation within quantitative and qualitative research contexts. This included the use of questionnaires, semi-structured interviews and observations. In the first instance, questionnaires were used to collect data from 278 library staff selected using systematic sampling technique. Interviewing targeted 69 senior library staff was done using purposive sampling technique. In total, 254 (91.4%) ordinary library staff completed the questionnaire; while 57 (82.6%) senior librarians were interviewed.

The study findings have indicated the low level of KM application in academic libraries. Muhimbili University of Health and Allied Science (MUHAS) Library showed the strongest application of KM practices, followed by State University of Zanzibar (SUZA) Library. Lack of KM enablers in academic libraries was indicated as one of the significant challenges that hinder the application of KM practices in academic libraries. It was noted that most of the academic libraries visited had websites. On the other hand, the majority of respondents acknowledged that they had personal accounts of the various Web 2.0 tools. The study findings imply that most library staff had some level of experience with a variety of Web 2.0 tools. It was further established that despite the high level of familiarity and use of Web 2.0 tools, respondents were not frequent users of their library websites.

The study findings have also indicated a low level of access and use of Web 2.0 tools within academic libraries. Mzumbe University (MU) and SUZA Libraries were the main users of Web 2.0 tools; followed by University of Dar-es-Salaam (UDSM) Library. Knowledge Management System (KMS) Success Model was employed to investigate factors that affect the application of Web 2.0 tools to enhance KM practices. The study findings have demonstrated that the KMS Success Model is suitable for guiding the understanding of the contributing factors with respect to library staff's intention to reuse Web 2.0 tools. The study findings supported the KMS Success Model well, whereby seven of the twelve hypothesised relationships were found to be significant.

The study recommends that academic libraries in Tanzania should promote and integrate KM practices in their daily operations as well as the use of KM enablers such as; reliable budget, Web 2.0 tools, reliable power supply, internet connectivity availability and adequate ICTs infrastructure.

### **KEYWORDS**

Web 2.0 tools; Knowledge; Knowledge Management (KM); Knowledge Management (KM) practices; Academic Libraries; Innovative Service Delivery; Library Staff; SECI Model; Web 2.0 SECI Drivel Model; Knowledge Management System (KMS); Information and communication technology (ICT); Tanzania.

## **ACKNOWLEDGEMENTS**

First and foremost, I thank the Almighty God for enabling me, and giving me strength and grace towards the successful completion of my PhD studies. I am grateful to the South African Postgraduate Studies Support at the University of South Africa (UNISA) for the financial support they extended to me during my study. I would like to acknowledge the academic, administrative, and technical supports from the UNISA, particularly in the award of admission and other necessary support for my studies and for this thesis processes. My remarkable appreciation also goes to my employer, The Nelson Mandela African Institution of Science and Technology (NM-AIST) for granting me a study leave to undertake my PhD studies in South Africa.

The unforgettable support from the former Vice Chancellor of NM-AIST, Prof Burton Mwamilla, and his deputies Deputy Vice Chancellors, Prof. Lughano Kusiluka, and Prof. Patrick Ndakidemi, is highly appreciated. My fellow workers Restituta Mhina, Monna Sitayo, Honorina Mashingia, Lilian Mbowe, Monica Chionda, Lightness Mselle, Francis Kayichile, Johnson Rugoye, Agnes Yamsebo and Naomi Kulwa for their moral support and the encouragement that they gave me throughout my studies. They were always there when I needed their support and they updated and assisted me on every necessary administrative issue concerning my studies.

My profound gratitude goes to my supervisors, Prof. Patrick Ngulube and Associate Prof. Tandi Lwoga for always being tremendous mentors to me. Their commitment to this work from the early stages of proposal development, during the fieldwork in Tanzania, throughout data analysis, and report writing period is really appreciated. Their good advice, patience and guidance have been invaluable on both an academic and personal levels. Tandi, you supported me as a mentor, a promoter, a supervisor in Tanzania and sometimes as a friend especially when I felt confused with my studies. I always remember our meetings sometimes until late nights. Prof. Ngulube, when I first came to your office at Theo van Wijk Building at UNISA to ask for advice on how to plan for Chapter Three (literature review and theoretical foundations) you were very positive and supportive, in spite of your busy schedule, you spared time whenever I requested a meeting at your office. Thank you all for the support and for allowing me to grow as a researcher.

Sincere thanks to the research departments/directorates at ARU, MU, MUHAS, OUT, SUA, SUZA, UDOM, and UDSM for granting me permission to conduct my field work. I am sincerely grateful to all library staff who participated in this study, for their co-operation and willingness to share their

experience. Without them, this study would not be possible. Special thanks go to Dr. Sofia (ARU), Dr. Mboni (MUHAS), Dr. Wema (UDSM), Prof. Dulle, Prof. Sife and Ms. Anajoyce Katabalwa (SUA) and Dr. Semzugi (OUT) for the support and co-operation they gave me during data collection in their academic libraries. I owe my deep gratitude to all field assistants, Shahazard Nasor (SUZA), Janeth Silayo (UDOM), Msagati (OUT), Justina Karata (UDSM), Deogratius Daniel (MU), Anajoyce Katabalwa (SUA), Tatu Muddy and Bernard Sengo (MUHAS) and Ester Momburi (ARU). Your support will always be remembered. I acknowledge the work done by my language editor.

I am indebted to my mother, Mrs. Christine Vincent Mosha and my late father, Mr. Vincent Malamia Mosha for their moral support and love, and for laying down the foundation of my education. Their prayers and encouragement are what has sustained me this far. Thank you very much for your endless love my parents. Big up to you! I appreciate the contribution of my lovely sister, Mary Vincent Mosha together with her husband, Dr. Gileard Masenga, her daughter Lina Gileard Masenga, and her son Louis Gileard Masenga, for their support and encouragement since my undergraduate studies. You are like shining stars for me in my academic and family issues. God bless you and your family, always.

I would not have gone through this academic achievement without the full support and encouragement from my beautiful and caring daughters, Sindisiwe Michael Haule and Christine Michael Haule, for their tolerance to the hardship they encountered while I was away and when I was busy with my PhD. My lovely children, I want you to remember that it is my deep love for you that made me aim for and able to accomplish my PhD studies. So please consider my absence as a challenge for you to work hard for your future life. I, unconditionally, love you so much.

## **DEDICATION**

In the loving memory of my late father, Mr. Vincent Malamia Mosha this thesis is dedicated.

## DECLARATION

Student No: 50777246

I declare that this study, “**Application of Web 2.0 tools to enhance knowledge management practices in academic libraries in Tanzania**”, is my own work and that all the sources I have used or quoted have been indicated and acknowledged by means of complete references. This thesis does not incorporate, without acknowledgement, any material previously submitted for degree or diploma in any university.

Neema

Signature

**Neema Florence Mosha**

1 March 2017

Date

## TABLE OF CONTENT

<b>SUMMARY.....</b>	<b>I</b>
<b>KEYWORDS .....</b>	<b>II</b>
<b>ACKNOWLEDGEMENTS.....</b>	<b>III</b>
<b>DEDICATION.....</b>	<b>V</b>
<b>DECLARATION.....</b>	<b>VI</b>
<b>TABLE OF CONTENT .....</b>	<b>VII</b>
<b>LIST OF TABLES.....</b>	<b>XIX</b>
<b>LIST OF FIGURE.....</b>	<b>XX</b>
<b>ABBREVIATIONS AND ACRONYMS.....</b>	<b>XXI</b>
<b>CHAPTER ONE.....</b>	<b>1</b>
<b>INTRODUCTION TO THE STUDY .....</b>	<b>1</b>
<b>1.0 INTRODUCTION.....</b>	<b>1</b>
<b>1.1 BACKGROUND TO THE STUDY.....</b>	<b>6</b>
1.1.1 KM and IM in academic libraries .....	6
1.1.2 KM practices and the role of KM enablers in academic libraries.....	11
1.1.3 The application of Web 2.0 tools in academic libraries.....	12
1.1.4 Changing academic libraries' roles.....	14
<b>1.2 RESEARCH PROBLEM.....</b>	<b>16</b>
<b>1.3 RESEARCH PURPOSE.....</b>	<b>18</b>



1.3.1	Objectives of the study.....	18
1.3.2	Research questions.....	19
<b>1.4</b>	<b>JUSTIFICATION FOR THE STUDY.....</b>	<b>19</b>
<b>1.5</b>	<b>ORIGINALITY OF THE STUDY .....</b>	<b>22</b>
<b>1.6</b>	<b>SIGNIFICANCE OF THE STUDY.....</b>	<b>24</b>
<b>1.7</b>	<b>DEFINITION OF TERMS .....</b>	<b>25</b>
<b>1.8</b>	<b>RESEARCH DESIGN AND METHODOLOGY .....</b>	<b>26</b>
<b>1.9</b>	<b>SCOPE AND DELIMITATION OF THE STUDY.....</b>	<b>28</b>
1.9.1	Scope.....	28
1.9.2	Limitation.....	28
<b>1.10</b>	<b>ETHICAL CONSIDERATIONS.....</b>	<b>28</b>
<b>1.11</b>	<b>OUTLINE OF THE THESIS.....</b>	<b>29</b>
<b>1.12</b>	<b>SUMMARY OF THE CHAPTER.....</b>	<b>30</b>
	<b>CHAPTER TWO.....</b>	<b>31</b>
	<b>THE CONTEXT OF THE STUDY .....</b>	<b>31</b>
<b>2.0</b>	<b>INTRODUCTION.....</b>	<b>31</b>
<b>2.1</b>	<b>UNITED REPUBLIC OF TANZANIA: AN OVERVIEW.....</b>	<b>31</b>
<b>2.2</b>	<b>HIGHER LEARNING INSTITUTIONS IN TANZANIA: AN OVERVIEW.....</b>	<b>32</b>
<b>2.3</b>	<b>ACADEMIC LIBRARIES IN TANZANIA .....</b>	<b>33</b>
<b>2.4</b>	<b>THE PROFILE OF THE ACADEMIC LIBRARIES SELECTED IN THE STUDY .....</b>	<b>33</b>

2.4.1	Ardhi University (ARU) .....	34
2.4.2	Muhimbili University of Health and Allied Sciences (MUHAS) .....	35
2.4.3	Mzumbe University (MU) .....	36
2.4.4	Open University of Tanzania (OUT) .....	36
2.4.5	Sokoine University of Agriculture (SUA) .....	37
2.4.6	The State University of Zanzibar (SUZA) .....	37
2.4.7	University of Dar-es-Salaam (UDSM).....	38
2.4.8	The University of Dodoma (UDOM).....	39
<b>2.5</b>	<b>TANZANIA INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) INFRASTRUCTURE: AN OVERVIEW.....</b>	<b>39</b>
<b>2.6</b>	<b>CHAPTER SUMMARY .....</b>	<b>41</b>
	<b>CHAPTER THREE.....</b>	<b>42</b>
	<b>LITERATURE REVIEW AND THE THEORETICAL FRAMEWORK OF THE STUDY .....</b>	<b>42</b>
<b>3.0</b>	<b>INTRODUCTION.....</b>	<b>42</b>
<b>3.1</b>	<b>THE SIGNIFICANCE OF A LITERATURE REVIEW.....</b>	<b>42</b>
<b>3.2</b>	<b>THE THEORETICAL FOUNDATIONS OF THE STUDY .....</b>	<b>43</b>
3.2.1	Academic Library 2.0 Concept Model.....	44
3.2.2	Knowledge Management Systems (KMS) success model.....	45
3.2.3	Knowledge Creation /SECI Model .....	47
3.2.3.1	Socialisation (conversion of tacit knowledge to new tacit knowledge) .....	48
3.2.3.2	Externalisation (conversion of tacit knowledge to new explicit knowledge) .....	49
3.2.3.3	Combination (Creation of new explicit knowledge).....	49
3.2.3.4	Internalisation (Creation of new tacit knowledge from explicit knowledge).....	50
3.2.4	Web 2.0 Driven SECI Model.....	52
3.2.4.1	Socialisation process .....	53
3.2.4.2	Externalisation process .....	53

3.2.4.3	Combination process.....	54
3.2.4.4	Internalisation process.....	54
3.2.5	The link between the theories/models and the research problem of the study .....	55
<b>3.3</b>	<b>CONCEPTUAL FRAMEWORK AND RESEARCH HYPOTHESES DEVELOPMENT...65</b>	
<b>3.4</b>	<b>EMPIRICAL REVIEW.....71</b>	
3.4.1	KM: an overview .....	71
3.4.2	KM schools of thought.....	80
3.4.2.1	Commercial school .....	81
3.4.2.2	Technocratic school .....	83
3.4.2.3	Behavioural school.....	84
3.4.3	The application of KM practices in academic libraries.....	85
3.4.4	Benefits of KM practices in academic libraries .....	86
3.4.4.1	Create knowledge repositories .....	86
3.4.4.2	Identification of knowledge expertise.....	87
3.4.4.3	Enhance knowledge innovation .....	88
3.4.4.4	Managing information overload.....	89
3.4.5	Knowledge creation and sharing in academic libraries.....	90
3.4.5.1	Knowledge creation practices .....	91
3.4.5.2	Knowledge sharing practices .....	93
3.4.6	KM enablers for the application of KM practices.....	95
3.4.6.1	Trust.....	96
3.4.6.2	KM policy and guidelines .....	96
3.4.6.3	Competencies and skills.....	97
3.4.6.4	Management support and leadership.....	99
3.4.6.5	Information and Communication Technology (ICT) infrastructure.....	101
3.4.6.6	Organisational culture .....	102
3.4.6.7	Incentives and rewards.....	104

3.4.7	Web 2.0 tools: an overview.....	105
3.4.8	Access and uses of Web 2.0 tools in academic libraries.....	107
3.4.9	The application of Web 2.0 tools to enhance KM practices in academic libraries.....	110
3.4.10	Categorises of Web 2.0 tools to enhance KM practices.....	115
3.4.10.1	Authoring tools .....	115
3.4.10.2	Social Networking Sites (SNSs) .....	118
3.4.10.3	Productivity applications.....	119
3.4.10.3.1	Tagging .....	119
3.4.10.3.2	Social bookmarking sites .....	120
3.4.10.3.3	Video and photo sharing sites .....	121
3.4.10.3.4	Microblogging sites.....	121
3.4.11	The role of the academic libraries to support the application of Web 2.0 tools to enhance KM practices	122
<b>3.5</b>	<b>CHALLENGES WHICH HINDER THE APPLICATION OF WEB 2.0 TOOLS TO ENHANCE KM PRACTICES IN ACADEMIC LIBRARIES .....</b>	<b>124</b>
3.5.1	Organisational challenges .....	124
3.5.2	Individual challenges .....	127
3.5.3	Technological and technical challenges.....	128
<b>3.6</b>	<b>CHAPTER SUMMARY .....</b>	<b>128</b>
	<b>CHAPTER FOUR .....</b>	<b>130</b>
	<b>RESEARCH METHODOLOGY.....</b>	<b>130</b>
<b>4.0</b>	<b>INTRODUCTION.....</b>	<b>130</b>
<b>4.1</b>	<b>RESEARCH PARADIGM.....</b>	<b>131</b>
<b>4.2</b>	<b>KEY SOCIAL SCIENCE RESEARCH PARADIGMS .....</b>	<b>134</b>
4.2.1	Positivism.....	134
4.2.2	Interpretivism.....	135

4.2.3	Pragmatism .....	137
<b>4.3</b>	<b>RESEARCH METHODOLOGY .....</b>	<b>139</b>
<b>4.2</b>	<b>RESEARCH DESIGN AND METHODS .....</b>	<b>141</b>
<b>4.3</b>	<b>STUDY POPULATION.....</b>	<b>143</b>
<b>4.4</b>	<b>SAMPLING.....</b>	<b>143</b>
4.4.1	Purposive sampling.....	144
4.4.2	Sample size .....	144
<b>4.5</b>	<b>DATA COLLECTION TECHNIQUES AND INSTRUMENTS .....</b>	<b>145</b>
4.5.1	Survey research.....	146
4.5.2	Research instruments .....	147
4.5.2.1	Questionnaire .....	147
4.5.2.5	Interview .....	152
4.5.3	Observation.....	154
4.5.3.1	Non-participant observation.....	156
4.5.4	Triangulation.....	157
4.5.4.1	Methodological triangulation.....	158
<b>4.6</b>	<b>RELIABILITY AND VALIDITY .....</b>	<b>159</b>
4.6.1	Reliability.....	159
4.6.2	Validity .....	160
4.6.3	Questionnaire, semi-structured interview guide and observation protocol pre-testing.....	161
4.6.4	Confirmatory factor analysis (CFA) .....	163
<b>4.7</b>	<b>DATA ANALYSIS .....</b>	<b>164</b>
4.7.1	Quantitative data .....	164
4.7.1.1	Organising quantitative data for analysis.....	164
4.7.1.2	Quantitative data analysis .....	165
4.7.1.3	Descriptive analysis .....	165
4.7.1.4	Multivariate analysis.....	166

4.7.1.5	Measurement model.....	166
4.7.2	Qualitative data analysis .....	167
<b>4.8</b>	<b>ETHICAL CONSIDERATIONS.....</b>	<b>167</b>
<b>4.9</b>	<b>EVALUATION OF THE RESEARCH METHODOLOGY .....</b>	<b>169</b>
<b>4.10</b>	<b>CHAPTER SUMMARY .....</b>	<b>170</b>
<b>CHAPTER FIVE.....</b>		<b>172</b>
<b>PRESENTATION AND ANALYSIS OF DATA.....</b>		<b>172</b>
<b>5.0</b>	<b>INTRODUCTION.....</b>	<b>172</b>
<b>5.1</b>	<b>DATA PRESENTATION .....</b>	<b>172</b>
<b>5.2</b>	<b>RESPONSE RATE AND BACKGROUND OF RESPONDENTS.....</b>	<b>173</b>
<b>5.3</b>	<b>KM AWARENESS.....</b>	<b>175</b>
<b>5.3.1</b>	<b>KM TRAINING AND KM TRAINING PROGRAMME.....</b>	<b>176</b>
<b>5.4</b>	<b>APPLICATION AND BENEFITS OF KM PRACTICES .....</b>	<b>178</b>
<b>5.4.1</b>	<b>APPLICATION OF KM PRACTICES.....</b>	<b>178</b>
<b>5.4.2</b>	<b>THE BENEFITS OF KM PRACTICES.....</b>	<b>180</b>
<b>5.5</b>	<b>KM ENABLERS FOR EFFECTIVE KM APPLICATION IN ACADEMIC LIBRARIES</b>	<b>181</b>
<b>5.6</b>	<b>KM PRACTICES THROUGH SECI PROCESSES.....</b>	<b>184</b>
5.6.1	Socialisation process .....	185
5.6.2	Externalisation process .....	186

5.6.3	Combination process.....	188
5.6.4	Internalisation process.....	189
5.7	The access and use of Web 2.0 tools in academic libraries .....	191
5.7.1	Web 2.0 tools awareness and Web 2.0 accounts.....	191
5.7.2	Websites and Web 2.0 tools in academic libraries.....	193
5.7.3	The uses of Web 2.0 tools in academic libraries.....	194
<b>5.8</b>	<b>THE APPLICATION OF WEB 2.0 TOOLS FOR KM IMPLEMENTATION.....</b>	<b>198</b>
5.8.1	Categories of Web 2.0 tools to enhance KM practices .....	198
5.8.2	Knowledge creation and sharing practices through Web 2.0 Driven SECI Model.....	200
5.8.2.1	Socialisation process .....	200
5.8.2.2	Externalisation process .....	201
5.8.2.3	Combination process.....	202
5.8.2.4	Internalisation process.....	203
<b>5.9</b>	<b>FACTORS THAT AFFECT THE APPLICATION OF WEB 2.0 TOOLS TO ENHANCE KM PRACTICES .....</b>	<b>204</b>
5.9.1	Data screening and examination .....	204
5.9.2	Measurement model.....	204
5.9.2.1	Structural Equation Modelling (SEM).....	208
5.9.3	The direct, indirect and total effect of the variables depicted .....	213
<b>5.10</b>	<b>CHALLENGES THAT HINDER THE APPLICATION OF WEB 2.0 TOOLS TO ENHANCE KM PRACTICES.....</b>	<b>214</b>
5.10.1	Challenges that hinder the application of KM practices in academic libraries .....	214
5.10.2	Challenges that hinder the application of Web 2.0 tools to enhance KM practices.....	215
<b>5.11</b>	<b>CHAPTER SUMMARY.....</b>	<b>218</b>
<b>CHAPTER SIX .....</b>	<b>219</b>	
<b>INTERPRETATION AND DISCUSSION OF RESEARCH FINDINGS.....</b>	<b>219</b>	
<b>6.0</b>	<b>INTRODUCTION.....</b>	<b>219</b>

<b>6.1</b>	<b>BACKGROUND OF RESPONDENTS .....</b>	<b>219</b>
<b>6.2</b>	<b>KM AWARENESS AMONG RESPONDENTS.....</b>	<b>220</b>
<b>6.3</b>	<b>THE APPLICATION AND BENEFITS OF KM PRACTICES IN ACADEMIC LIBRARIES .....</b>	<b>221</b>
<b>6.4</b>	<b>KM ENABLERS FOR THE APPLICATION OF KM PRACTICES.....</b>	<b>228</b>
<b>6.5</b>	<b>KNOWLEDGE CREATION AND SHARING PRACTICES THROUGH KNOWLEDGE CREATION (SECI) MODEL.....</b>	<b>233</b>
6.5.1	Socialisation process .....	234
6.5.2	Externalisation process .....	235
6.5.3	Combination process.....	237
6.5.4	Internalisation process.....	238
<b>6.6</b>	<b>THE ACCESS AND USE OF WEB 2.0 TOOLS IN ACADEMIC LIBRARIES .....</b>	<b>239</b>
6.6.1	Web 2.0 tools awareness and Web 2.0 tools accounts .....	239
6.6.2	The uses of Web 2.0 tools in academic libraries.....	241
6.6.3	The uses of various Web 2.0 tools in academic libraries .....	243
<b>6.7</b>	<b>THE APPLICATION OF WEB 2.0 TOOLS TO ENHANCE KM PRACTICES IN ACADEMIC LIBRARIES .....</b>	<b>248</b>
<b>6.8</b>	<b>KNOWLEDGE CREATION AND SHARING PRACTICES THROUGH WEB 2.0 DRIVEN SECI MODEL .....</b>	<b>252</b>
6.8.1	Socialisation process .....	252
6.8.2	Externalisation process .....	252
6.8.3	Combination process.....	253
6.8.4	Internalisation process.....	253
<b>6.9</b>	<b>FACTORS THAT AFFECT THE APPLICATION OF WEB 2.0 TOOLS TO ENHANCE KM PRACTICES .....</b>	<b>253</b>



<b>6.10</b>	<b>CHALLENGES THAT HINDER THE APPLICATION OF WEB 2.0 TOOLS TO ENHANCE KM PRACTICES IN ACADEMIC LIBRARIES</b> .....	<b>260</b>
6.10.1	Challenges which hinder the application of KM practices in academic libraries .....	260
6.10.2	Challenges that hinder the application of Web 2.0 tools to enhance KM practices .....	263
<b>6.11</b>	<b>CHAPTER SUMMARY</b> .....	<b>266</b>
	<b>CHAPTER SEVEN</b> .....	<b>268</b>
	<b>SUMMARY OF THE STUDY FINDINGS, CONCLUSIONS AND RECOMMENDATIONS</b> .....	<b>268</b>
<b>7.0</b>	<b>INTRODUCTION</b> .....	<b>268</b>
<b>7.1</b>	<b>SUMMARY OF THE FINDINGS BASED ON RESEARCH QUESTIONS</b> .....	<b>268</b>
7.1.1	Summary of the general information of the study .....	268
7.1.2	Summary of the levels of KM awareness among respondents.....	269
7.1.3	Summary of the KM enablers for the application of KM practices in academic libraries....	269
7.1.4	Summary of the knowledge creation and sharing activities through SECI processes .....	270
7.1.5	Summary of the access and use of Web 2.0 tools in academic libraries.....	272
7.1.6	The application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania 273	
7.1.6.1	The access and use of Web 2.0 tools to enhance KM practices in academic libraries.....	273
7.1.6.2	Summary of knowledge creation and sharing practices through the application of Web 2.0 SECI Driven Model .....	273
7.1.7	Summary of the factors that affect the application of Web 2.0 to enhance KM practices in academic libraries.....	274
<b>7.2</b>	<b>CONCLUSIONS</b> .....	<b>276</b>
7.2.1	Conclusion on the background of the respondents .....	276
7.2.2	Conclusion on the KM awareness among library staff .....	277
7.2.3	Conclusion of the benefits of KM practices in academic libraries .....	278
7.2.4	Conclusion on the KM enablers for the application of KM practices.....	279
7.2.5	Conclusion on knowledge creation and sharing practices through SECI processes .....	280
7.2.6	Conclusion on the access and use of Web 2.0 tools in academic libraries.....	280
7.2.7	Conclusion on the application of Web 2.0 tools to enhance KM practices .....	282

7.2.8	Conclusion on the factors that affect the application of Web 2.0 tools to enhance KM practices	284
7.2.9	Conclusion on the challenges that hinder the application of Web 2.0 tools to enhance KM practices	284
<b>7.3</b>	<b>RECOMMENDATIONS</b>	<b>286</b>
7.3.1	Recommendation on the background of the respondents	286
7.3.2	Recommendation on the KM awareness among respondents	286
7.3.3	Recommendation on benefits of KM practices in academic libraries	287
7.3.4	Recommendation on KM enablers for the application of KM practices	292
7.3.5	Recommendation on knowledge creation and sharing practices	294
7.3.6	Recommendation on the access and use of Web 2.0 tools in academic libraries	296
7.3.7	Recommendation on the application of Web 2.0 tools to enhance KM practices in academic libraries	302
7.3.8	Recommendation on the factors that affect the application Web 2.0 tools to enhance KM practices	304
7.3.9	Recommendations on the challenges that hinder the application of Web 2.0 tools to enhance KM practices	305
<b>7.4</b>	<b>PROPOSED INTEGRATED AND INCLUSIVE FRAMEWORK FOR APPLICATION OF WEB 2.0 TOOLS AND KM PRACTICES IN ACADEMIC LIBRARIES IN TANZANIA</b>	<b>305</b>
7.4.1	Proposed framework	307
7.4.2	Justification of the framework	308
7.4.3	Explanation of the framework	309
7.4.3.1	KM awareness	309
7.4.3.2	KM enablers	310
7.4.3.3	KM uses and benefits	311
7.4.3.4	KM practices	311
7.4.3.5	Access and use of Web 2.0 tools	312
<b>7.5</b>	<b>IMPLICATIONS OF THE STUDY</b>	<b>312</b>
<b>7.6</b>	<b>SUGGESTIONS FOR FUTURE RESEARCH</b>	<b>314</b>
<b>7.7</b>	<b>GENERAL CONCLUSION</b>	<b>314</b>

<b>REFERENCES.....</b>	<b>316</b>
<b>APPENDICES.....</b>	<b>359</b>
<b>APPENDIX 1: RESEARCH OBJECTIVES, RESEARCH QUESTIONS AND DATA COLLECTION TOOLS/INFORMATION SOURCES.....</b>	<b>359</b>
<b>APPENDIX 2: SURVEY QUESTIONNAIRE FOR LIBRARY STAFF.....</b>	<b>361</b>
<b>APPENDIX 4: OBSERVATION CHECKLIST.....</b>	<b>373</b>
<b>APPENDIX 5: VARIABLES AND ITEMS INCLUDED IN THE QUESTIONNAIRE .....</b>	<b>375</b>
<b>APPENDIX 6: ACCEPTANCE LETTER OF DATA COLLECTION FROM ARU .....</b>	<b>380</b>
<b>APPENDIX 7: ACCEPTANCE LETTER OF DATA COLLECTION FROM MUHAS.....</b>	<b>381</b>
<b>APPENDIX 8: ACCEPTANCE LETTER OF DATA COLLECTION FROM MU .....</b>	<b>382</b>
<b>APPENDIX 9: ACCEPTANCE LETTER OF DATA COLLECTION FROM UDSM .....</b>	<b>383</b>
<b>APPENDIX 10: ACCEPTANCE LETTER OF DATA COLLECTION FROM UDOM.....</b>	<b>384</b>
<b>APPENDIX 11: ACCEPTANCE LETTER OF DATA COLLECTION FROM SUA .....</b>	<b>385</b>
<b>APPENDIX 12: ACCEPTANCE LETTER OF DATA COLLECTION FROM SUZA.....</b>	<b>386</b>
<b>APPENDIX 13: ETHICAL CLEARANCE FROM UNISA.....</b>	<b>387</b>

## LIST OF TABLES

Table 1.1:1 Differences between KM and IM .....	8
Table 3.2:1 Nonaka's four modes of knowledge conversion.....	51
Table 3.4:1 The relationship between data, information and knowledge .....	75
Table 3.4:2 Example of tacit and explicit knowledge.....	76
Table 3.4:3 Multiple perspectives on knowledge .....	81
Table 3.4:4 Skills and knowledge for KM implementation.....	97
Table 3.4:5 Competencies and skills for information specialists.....	98
Table 3.4:6 Comparisons between Web 1.0 and Web 2.0 .....	106
Table 3.4:7 The difference between Library 1.0 and Library 2.0 .....	107
Table 3.4:8 Application of Web 2.0 tools in academic libraries.....	108
Table 3.4:9 Comparisons between Web 2.0 tools and KM.....	113
Table 4.4.1:1 Research paradigm.....	132
Table 4.4:1 Sample size for library staff.....	145
Table 5.2:1 Distribution of questionnaire in academic libraries .....	173
Table 5.2:2 Background of respondents: survey (questionnaire) (N=254).....	174
Table 5.2:3 Background of respondents: semi-structured interview (N=57).....	175
Table 5.3:1 KM awareness among respondents.....	176
Table 5.3.1:1 Individual KM training and KM training programmes.....	177
Table 5.4.1:1 Logistic regression for factors associated with KM application.....	179
Table 5.4.2:1 The benefits of KM practices in academic libraries (N=254).....	180
Table 5.5:1 KM enablers for the application of KM practices .....	182
Table 5.6:1 Knowledge creation and sharing practices under socialisation process .....	185
Table 5.6:2 Knowledge creation and sharing practices through externalisation process.....	187
Table 5.6:3 Knowledge creation and sharing practices under combination process .....	188
Table 5.6:4 Knowledge creation and sharing practices under internalisation process.....	190
Table 5.6:5 Respondents' personal accounts in Web 2.0 tools.....	192
Table 5.6:6 Access of Web 2.0 tools in academic libraries .....	194
Table 5.6:7 The uses of Web 2.0 tools in the academic libraries.....	195
Table 5.6:8 Logistic regression for factors associated with Web 2.0 access and use .....	196
Table 5.8:1 Categories of Web 2.0 tools to enhance KM practices (N=254) .....	199
Table 5.8:2 Knowledge creation and sharing practices under socialisation .....	201
Table 5.8:3 Knowledge creation and sharing practices through externalisation process.....	202
Table 5.8:4 Knowledge creation and sharing practices under combination process .....	203
Table 5.8:5 Knowledge creation and sharing practices under internalisation process.....	203
Table 5.9:1 Model fit indices for the measurement model .....	206
Table 5.9:2 CFA results for measurement model .....	207
Table 5.9:3 Composite Reliability (CR), Average Variance Extracted and Discriminant Validity of constructs .....	208
Table 5.9:4 Model fit indices for the structural model.....	209
Table 5.9:5 Model fit indices for the modified structural model .....	212
Table 5.9:6 Hypotheses testing results.....	213
Table 5.9:7 The direct, indirect and total effect of the variables depicted.....	214
Table 5.10:1 Challenges that hinder the application of KM practices in academic libraries.....	215
Table 5.10:2 Challenges that hinder the application of Web 2.0 tools to enhance KM practices.....	216

## LIST OF FIGURE

Figure 2.1:1 Map of Tanzania.....	32
Figure 3.2:1 Academic Library 2.0 concept model.....	45
Figure 3.2:2 Jennex and Olfman KMS Success Model .....	47
Figure 3.2:3 SECI processes .....	51
Figure 3.2:4 Web 2.0 driven SECI model.....	54
Figure 3.3:1 KMS Success Model .....	67
Figure 3.4:1 Primary sources of information .....	73
Figure 3.4:2 Tacit –explicit knowledge continuum .....	78
Figure 3.4:3 Five essentials of web 2.0 tools within libraries.....	108
Figure 4.2:1 Research design for the study.....	142
Figure 5.9:1 Measurement model .....	205
Figure 5.9:2 Structural model .....	209
Figure 5.9:3 Modified SEM.....	211
Figure 7.3:1 Knowledge creating a cycle in Web 2.0 sites.....	295
Figure 7.3:2 Example of Social media policy in a library .....	300
Figure 7.4:1 The application of Web 2.0 tools and KM practices framework.....	307

## **ABBREVIATIONS AND ACRONYMS**

ACRL	Association of College and Research Libraries
ALA	American Library Association
ARU	Ardhi University
AST	Adaptive Structuration Theory
AST	Adaptive Saturation Theory
AUL	Australasian University Libraries
AVE	Average Variation Extraction
CAS	Current Awareness Services
CC	Computer Centre
CCE	Centre for Continuing Education
CFA	Confirmatory Factor Analysis
CILIP	Chartered Institute of Library and Information Professionals
CIO	Chief Information Officer
CKO	Chief Knowledge Officer
CMS	Content Management System
COTUL	Consortium of Tanzanian University and Research Libraries
CR	Composite Reliability
DIKW	Data, Information, Knowledge and Wisdom
EALA	East African Library Association
EASSY	Eastern Africa Submarine Cable System
EFA	Exploratory Factor Analysis
HSDPA	High Speed Downlink Packet Access
ICE	Institute of Continuing Education
ICTs	Information and Communication Technologies
IFLA	International Federation of Library Associations and Institutions
IHSS	Institute of Human Settlement Studies
IKFL	Institute of Kiswahili and Foreign Languages
ILL	Inter-Library Literacy
ILT	Inter- Library Training
IR	Institution Repository
IS	Information System
IT	Information Technology

ITECH	International Training and Educational Centre for Health
ITU	International Telecommunication Union
IUCEA	Inter-University Council for East Africa
KM	Knowledge Management
KMA	Knowledge Management Africa
KMO	Kaiser Meyer Olkin
KMS	Knowledge Management System
KR	Knowledge Repository
LIS	Library and Information Services
MCNY	Metropolitan College of New York
MMC	Muhimbili Medical Centre
MNH	Muhimbili National Hospital
MoCU	Moshi Co-operative University
MoFEA	Tanzanian government under its Ministry of Finance and Economic Affairs
MSTHE	Ministry of Science, Technology and Higher Education
MU	Mzumbe University
MUCHS	Muhimbili University College of Health Sciences
MUHAS	Muhimbili University of Health and Allied Sciences
MUIR	Mzumbe University Institutional Repository
MWCT	Ministry of Works, Communications and Transport
NICTBB	National ICT Broadband Backbone
NM-AIST	Nelson Mandela African Institution of Science and Technology
ODL	Open and Distance Learning
OECD	Organisation for Economic Co-operation and Development
OPAC	Online Public Access Catalogue
OUT	Open University of Tanzania
PDA	Personal Digital Assistance
QoS	Quality Of Service
RSS	Rich Site Summary/ Really Simple Syndication
SADE	School of Architecture and Design
SCEM	School of Construction Economics and Management
SDI	Selective Dissemination of Information
SEAS	School of Education, Arts and Sciences
SECI	Socialisation, Externalisation, Combination and Internalisation

SEM	Structural Equation Modeling
SEST	School of Environment Science and Technology
SGST	School of Geospatial Sciences and Technology
SNAL	Sokoine National Library
SNSs	Social Networking Sites
SPSS	Statistical Package for the Social Sciences
SQL	Structured Query Language
SSA	Sub Saharan Africa
STI	Scientific and Technical Information
SUA	Sokoine University of Agriculture
SUIR	Sokoine University Institutional repository
SURP	School of Urban and Regional Planning
SUZA	State University of Zanzibar
TANESCO	Tanzania Electrical Supply Company
TAZARA	Tanzania Zambia Railway Authority
TCRA	Tanzania Communication Regulatory Authority
TCU	Tanzania Commissions of Universities
TENET	Tanzania Education Network
TLA	Tanzania Library Association
TLS	Tanzania Library Services
TLSB	Tanzania Library Services Board
TRA	Theory of Reasoned Action
TRC	Tanzania Railways Corporation
TTCL	Tanzania Telecommunications Company Limited
UCC	University of Dar es Salaam Computing Centre
UCLAS	University College of Lands and Architectural Studies
UDOM	University of Dodoma
UDSM	University of Dar-es-Salaam
UEA	University of East Africa
UMTS	Universal Telecommunications Systems
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNISA	University of South Africa



UP	University of Pretoria
VLE	Virtual Learning Environments
VRE	virtual research environments
WiMAX	Worldwide Interoperability of Microwave Access
ZANTEL	Zanzibar Telecom Limited

## CHAPTER ONE

### INTRODUCTION TO THE STUDY

#### 1.0 Introduction

The global knowledge-based economy has brought new challenges in various sectors worldwide. Currently, knowledge has become an important asset as compared to labour, land and capital (Maponya 2004). Drucker (1993) made it known that the basic economic resource is no longer the capital, natural resources, or labour but is and will be the knowledge. Thus, human knowledge and their capabilities have always been at the central place in the global info-economy. The study of human knowledge has been a central subject matter of philosophy and epistemology since the Ancient Greeks and the historical perspective of KM. It reveals as an old mission pursued by Eastern and Western philosophers (Kakabadse, Kakabadse, and Kouzmin 2003). Knowledge is the core concept of KM practices (Choi and Lee 2002).

KM practices began in the mid of 1990s (Hislop 2013) and it began to gain attention in profit-oriented institutions such as companies and industries where the foundation of industrialised economies has been shifted from natural resources to intellectual assets (Razi, Karim, and Lumpur 2011). Thereafter, the consequences of KM practices had spread to non-profit institutions such as government agencies, hospitals, schools, universities and libraries (Che Rusuli, Tasmin, and Takala 2012; Maponya 2004; Mavodza 2010; Townley 2001).

The majority of academic libraries have now, significantly, developed and are applying some KM practices in the provision of library services (Gandhi 2004; Singh 2007). It is also evident that most of the academic libraries have been undergoing a period of profound changes and true paradigm shift which seem to affect information access, retrieval, use and storage. This necessitates academic libraries to become not only information providers but also information/knowledge seekers which demand the libraries seeking knowledge from their users as well as in-house knowledge of their employees. Kim and Abbas (2010) assert that academic libraries' primary functions are to act as the Knowledge Repository (KR) and an agent of dissemination of knowledge. Thus, the basic goal of KM practices in academic libraries has been to leverage the available knowledge that may help library staff to carry out their tasks more efficiently and effectively. Trivedi (2007) has explained KM application in academic libraries as follows:-

Knowledge management within libraries is not just managing or organising books or journals, searching the internet for clients or arranging the circulation of materials. However, each of the activities can, in some way, be part of the knowledge management spectrum and process. Nevertheless, knowledge management is about enhancing the use of organisational knowledge through sound practices of knowledge management and organisational learning. Thus, knowledge management is an effective and functional combination of information management, communication and human resources.

Based on the explanations above, it has become evident that advantages of KM practices has been relevant to academic libraries, and most importantly to be recognised as a part of corporate advantages. Consequently, the advantages have made academic libraries speak about “managing” and “sharing” in more practical ways (Jain 2007; Kebede 2010; Maponya 2004; Mavodza 2010; Townley 2001). Hislop (2013) explains that one of the primary rationales for organisations managing their knowledge is to allow knowledge to be more widely and efficiently shared within organisations. Good KM practices help to transform academic libraries into a more efficient knowledge creation and sharing engines.

KM practices involve various knowledge handling activities such as knowledge creation, acquiring, capturing, using, storing, retrieving and sharing activities (Alavi and Leidner 2001; Karim, Razi and Mohamed 2012). However, among the mentioned KM practices knowledge creation and sharing have been given much importance among KM authors (Lee and Choi 2003). Nonaka and Toyama (2003) have defined knowledge creation as a dialectical process in which various contradictions are synthesized through dynamic interactions among individuals, organisations, and environment; while Karim, Razi, and Mohamed (2012) have defined knowledge sharing as the process through which explicit and tacit knowledge are communicated, transferred and discussed to others. This is done by individuals, groups, and across groups. Therefore, knowledge creation and sharing have also been considered as KM practices in this study. The justification for choosing knowledge creation and sharing practices are indicated below:-

- (a) Knowledge production/creation in most of higher learning institutions requires and involves the application of existing bodies of knowledge and creation of new knowledge. Thus, the ongoing knowledge creation and development represents an important and intrinsic feature of the primary task of a knowledge worker (Hislop 2013);
- (b) Knowledge sharing is believed by many organisations as a panacea for knowledge creation, and an important catalyst to improve innovation, productivity, and understanding among employees;

- (c) There is, indeed, a close relationship between knowledge creation and knowledge sharing. Nonaka and Takeuchi (1995) provide that among the benefits of knowledge sharing include knowledge creation. Therefore, issues such as creativity and innovation, quality of service, employee empowerment, and better decision making could be performed under knowledge creation and knowledge sharing better than any other aspects of KM;
- (d) Knowledge creation has been considered to be important, but such knowledge was not communicated and shared among members;
- (e) Lack of knowledge sharing culture in the majority of academic libraries was hinted by Nonaka and Konno (1998) believed that organisation has an important role in promoting knowledge sharing;
- (f) Lack of models and theories to support the creation and sharing of knowledge and to identify the factors that affect the application of Web 2.0 tools to enhance KM practices in academic libraries; and
- (g) The requirements and procedures for knowledge sharing within organisations have been emphasised.

There are two basic types of knowledge, namely explicit and tacit knowledge (Hislop 2013). Academic libraries worldwide store explicit and tacit knowledge. Explicit knowledge is obtained from written documents such as books, articles, historical documents, self-study documents, conference proceedings, research articles and minutes of meetings. Research and scholarly articles/reports are among the tangible assets in academic institutions. They are also regarded as explicit knowledge.

Tacit knowledge is obtained from peoples' minds. It is also owned by the one who possesses such knowledge. It has intellectual property rights which allow an individual to own its creativity and innovation the same way as they can own physical properties (Hislop 2013). Academic libraries need to identify and evaluate tacit knowledge from individuals and make them explicit through codification process so that such knowledge can easily be retrieved, accessed and used. Hislop (2013) adds that knowledge is implanted in the processes, documented as explicit knowledge and stored in the heads of human beings as tacit knowledge.

Further, Hislop (2013) asserts that regardless the fact that tacit knowledge is stored in humans' minds, and such a knowledge can be accessed, used and shared through codification strategy. Knowledge can be

codified, made explicit, and separated from the person who has created it, developed it, or utilised it. Williams et al. (2004:99) explain that “.....when information and knowledge flow, they can be captured, organised and made accessible for reuse. Therefore, there exists the potential for the subsequent creation of new knowledge...” Both tacit and explicit knowledge need to be stored in knowledge repositories to allow people to access, retrieve and use it. Academic libraries are, therefore, required to ensure the storage and use of explicit knowledge which is stored in various documents; and use of codified tacit knowledge extracted from peoples’ mind (Hislop 2013).

Information and Communication Technology (ICT) has played a prominent role in KM practices and KM research. Through centuries, ICT has found their way in influencing KM practices, for example, the craft guild culture of the Thirteenth Century had introduced more explicit and systematic KM practices (Kakabadse, Kakabadse, and Kouzmin 2003). Thus, the application of ICT to enhance KM practices provides people with the potential for greatly enhanced access to knowledge combined with the challenge of how to access, retrieve and use knowledge (Hawkins 2000).

Omona, Van der Weide, and Lubega (2010) assert that the adoption of ICT brought new methods, tools and techniques in the development of KM systems’ frameworks, knowledge processes and knowledge technologies to promote KM practices for improved service deliveries. ICT has advanced tremendously in recent times with the development of various technological tools such as Web 2.0 technologies, intranet, groupware and social media tools (Nelson 2008). Levy (2009) adds that, by the late 2000s, one of the most common ways that ICT was being argued as facilitating KM initiatives were via the use of Web 2.0 technologies. Thus, in considering the use of ICT, the focus in this study, is the application of Web 2.0 tools to enhance KM practices in academic libraries.

The term “Web 2.0” was first coined by Tim O’Reilly in a conference during a brainstorming session between O’Reilly and MediaLive International (O’Reilly 2005). O’Reilly (2005) has defined Web 2.0 as “the business revolution in the computer industry caused by the move to use the Internet as a platform, and an attempt to understand the rules for success on that new platform. Web 2.0 is a natural platform for the open learning materials which is also called open courseware that comprises a number of online technological tools used to facilitate online communication, participation, collaboration and sharing of knowledge (Hislop 2013). Web 2.0 tools facilitate a more socially connected web where people can easily communicate, edit, collaborate, participate, and share knowledge (Hosseini and Hashempour 2012:139).

Library 2.0, on the other hand, is the integration of Web 2.0 features in the library web-based services (Kim and Abbas 2010; Maness 2006). Majumdar and Shukla (2008:463) have explained that “Library 2.0 is equivalent to Web 2.0 concepts and applications in the Library and Information Services (LIS) sector”. Tarade and Singh (2013) have added that Library 2.0 is a concept taken from Web 2.0 to make information available anywhere at any time, the user requires it. Thus, in this study, most of the activities under Library 2.0 were covered in the Web 2.0 application.

Generally, the application of Web 2.0 tools in academic libraries has transformed the normal activities of such libraries to a more collaborative process in which they can easily share, use, retrieve and access information with other librarians and library users (Ram, Anbu, and Kataria 2011:453). Dave and Koskela (2009) add that in the Web 2.0 environment library users are no longer passively receiving information; they are editing information, communicating, participating and sharing information online. Kim and Abbas (2010:211) assert that the capabilities of Web 2.0 are more in enabling library users to engage the library in two-way communication and knowledge exchange. Instead of users physically coming to the library, the library delivers services to users via the access of library/university website.

The importance of Web 2.0 tools to facilitate KM practices is well acknowledged by various authors. Hislop (2013), as well as Mavodza (2010), support that KM implementation requires the use of ICT, including Web 2.0 tools. Levy (2009) provides that the application of Web 2.0 to facilitate KM practices is also known as the application of KM 2.0 which means “managing knowledge in the light of Web 2.0 existence”. The application of Web 2.0 tools to enhance KM practices provide better ways which allow knowledge to flow, communicated and shared among many users. It is also reported that the key to making KM practices work is not by managing knowledge only, but also by making such knowledge more visible through the use of Web 2.0 tools (Nelson 2008:135).

Shang et al. (2011:178) add that Web 2.0 technologies build a platform on which users can exchange information, express thoughts and reconfigure existing explicit knowledge. KM is a collaborative process; thus the application of Web 2.0 tools could provide ample prospects for both internal and external collaboration (Nelson 2008:135). It is evident that most of its activities are decentralised. Therefore, people are required to add information or knowledge voluntarily. In addition to individual knowledge generation, Kane and Fichman (2009) add that Web 2.0 platform has emerged as a visible channel of knowledge building for general and discipline-specific communication. KM practices are based on people and without people; KM practices cannot essentially take place. Thus, an active participation of users is practically necessary. Among the principles of using Web 2.0 tools is the active participation of users

(Hislop 2013; Levy 2009; Nelson 2008). Web 2.0 tools are used to facilitate interpersonal communication, interaction and collaboration which allow people to develop a sense of community and a shared identity within a KM environment.

Levy (2009) asserts that some of the features of Web 2.0 tools have their roots in KM practices. Wiki is an example of Web 2.0 tool which is also a part of the KM toolbox (Ram, Anbu, and Kataria 2011). In this case, Wiki allows individual to write and edit or remove information (Wagner and Majchrzak 2007). This functionality is important because virtual forms of collaboration are critical for knowledge sharing and coordination in the knowledge society (Kosonen and Kianto 2009). Additionally, library success is the best practice of Wiki ([www.libsuccess.org](http://www.libssuccess.org)) used by librarians across the world to share their knowledge and successful projects and to facilitate collaboration and participation across academic libraries.

Despite the advantages of Web 2.0 tools, their application to support KM practices in academic libraries in Tanzania as well as in other Sub-Saharan African (SSA) countries is still slow and unplanned (Akeriwa, Penzhorn, and Holmner 2014; Lwoga 2013; Makori 2012; Muneja and Abungu 2012). Therefore, this study has investigated the application of Web 2.0 tools to enhance KM practices (knowledge creation and sharing practices) in academic libraries. In other words, it has investigated how KM practices could be enhanced in the light of Web 2.0 tools. Therefore, there is a need for academic libraries worldwide to implement and use different types of Web 2.0 tools to enable individuals to contribute to the organisational knowledge base.

## **1.1 Background to the study**

Tanzania comprises 29 recognised private and public universities (TCU 2014). Some of them have libraries that integrate and use Web 2.0 tools for innovative service delivery as well as to facilitate KM practices. The main aim of this study was to investigate the application of Web 2.0 tools to enhance KM practices in academic libraries. The following sub-sections provide the background to the study.

### **1.1.1 KM and IM in academic libraries**

The question of whether libraries should consider KM and not information management (IM) was clarified by having an insightful understanding of various dimensions of KM, and the relationship between KM and IM in academic libraries. IM is seen as an essential prerequisite for KM (Chen, Snyman, and Sewdass 2005; Grey 1998). Global trends have resulted in the shift towards a knowledge-based

economy, necessitating KM which encompasses both the management of information and management of people (Chen, Snyman, and Sewdass 2005). Davenport (2005) noted that:

Knowledge Management is related to Information Management but is not the same thing simply because Knowledge and Information are not identical. Information is atomic and static, but knowledge is associative, rich, multi-layered, multifaceted, contextual, accessible, and dynamic. For example, Information is what you get when you run a web search on Google but knowledge is what you would get or at least get closer to if all of the results that came back from that search were relevant to what you actually wanted, and were presented consistently.

Chen, Snyman, and Sewdass (2005), as well as Grey (1998), explain that knowledge cannot be managed directly; only the information about knowledge possessed by people in organisations can be managed. Indeed knowledge is derived from information, but it is a cut above information. Jain (2007) asserts that both IM and KM involve human element, however at different levels. Jain and Nfila (2006:181) provide the differences between KM and IM as follows:

- (a) IM sees information as the resource and lays emphasis on human involvement in terms of information audit, acquiring, storing, retrieving, and disseminating information. It works with objects and achieves its success on the prevention and retrieval of information; and
- (b) KM is working with people. Its success depends on the use of knowledge. It emphasises on people management to take into custody the hidden knowledge from their heads. KM focuses on sharing, creating, learning and enhancing information for organisational improvement. In other words, it targets the collection and distribution of knowledge – both explicit and tacit in a contextual manner.

Jain (2007) distinguishes KM from IM by analysing work patterns that are IM works with objects (data or information) and KM works with people. IM deals exclusively with explicit representations and guarantees access, security, delivery, and storage. In this case efficiency, timeliness, accuracy, completeness, speed, the cost of storage and recoveries are the main concerns. On the other side, KM values originality, innovation, agility, adaptability, intelligence and organisational learning. Therefore, KM focuses on people and is more concerned with critical thinking, innovation, relationships, exposition of ideas, standards, skills and encouraging learning and sharing of experiences. Table 1.1:1 provides the key differences between KM and IM as summarised by Jain (2007).



Table 1.1: Differences between KM and IM

S/N	Aspect analysed	Information Management	Knowledge Management
1	Work element	Object (data and information).	People (knowledge).
2	Validity/credibility	Information has no universally accepted meaning.	The KM depends on a greater degree of certainty and validity.
3	Nature	Flow of information.	Knowledge is formed by these IM information flow.
4	Formation	The information is a framework for knowledge.	Knowledge embraces organisational values, beliefs, and actions.
5	Success factors	Depend on the preservation and retrieval of information.	Depend on the use of knowledge.
6	Particulars	Knowledge is extrapolative and future oriented.	The information is organised data.
7	Involvement of the human element	The IM sees the information as a resource and insists on human involvement in terms of information storage, retrieval, and audit. It aims at acquisition, storage, retrieval and dissemination of information.	The KM emphasises the management of people in order to take into custody the hidden knowledge of their heads. Focuses on knowledge sharing, creating, learning and improving information for the organisation.
8	Type of knowledge	Focuses primarily on explicit and documented knowledge.	Seeks both explicit and tacit knowledge.

KM practices in academic libraries call for a paradigm shift from traditional librarians to modern information professionals, from library managers to knowledge managers, and from libraries to knowledge centres (Jain 2007:379). Jain (2007:377) explains that it is very difficult for librarians to establish whether, or not they are library managers or knowledge managers, and whether they are working in libraries or knowledge centres. As a matter of fact, librarians are ultimate knowledge operators and managers.

Librarians, as well as, libraries are still in believing that KM is simply managing information and explicit or documented knowledge. This is what they have been doing for many years (Chandra 2005; Koina 2003). The majority of libraries manage information as a starting point and then leads to KM practices. Chen, Snyman, and Sewdass (2005) add that the concept of IM has been used and discussed for many years in libraries. In addition, Jain (2007:379) asserts that both KM and IM refer to the activities and tasks which are performed by library staff to satisfy their users' need.

Chandra (2005), as well as Jain and Nfila (2006), add that however, the concept of KM is still new in the majority of the academic libraries, some of the elements of KM practices such as acquisition, creation,

renewal, organising, archiving and dissemination of knowledge are very present in academic libraries today. Further, Jain (2007) asserts that KM is not primarily about managing or organising books or magazines, and search the internet for users or making the material movement to disseminate information. KM encompasses the whole organisation, not just the bits in the library, and it includes tacit knowledge as well as explicit knowledge (Jain and Nfila 2006). The application of KM in the academic libraries employs the use of organisational knowledge through sound practices of KM and organisational learning (Mavodza 2010). Chandra (2005) adds that KM emerged to improve the use of organisational knowledge through better practices and organisational learning which could be obtained either from books, magazines, the Internet and other documents (explicit knowledge) or stored in human heads (tacit knowledge).

Chandra (2005:246) defines KM as a discipline that promotes an integrated approach towards identifying, managing and sharing of all of an enterprise's information assets. As such, these information assets include database, documents, policies and procedures as well as previously unarticulated expertise and experience resident in individual workers. Therefore, to access and use information, one has or needs to acquire both theoretical and practical knowledge (Kakabadse, Kakabadse, and Kouzmin 2003). KM issues include developing, implementing and maintaining the appropriate technical and organisational infrastructure to enable knowledge sharing (Chandra 2005). At this juncture, KM is defined as a "conscious strategy of getting the right knowledge to the right people at the right time and helping people to share and put information into action in ways that strive to improve organisational performance" (O'Dell and Jackson 1998).

Practically, KM is a more holistic and wider form of IM (Jain and Nfila 2006:180) and; therefore, there is a need for academic libraries to manage knowledge rather than information. Academic libraries need to manage the knowledge of their parent organisations, thus to assist their organisations to use and apply organisational knowledge to achieve the desired organisational goals (Madge 2010). In view of the fact that KM is wider than IM in terms of activities involved, IM can be considered as the "building block" of KM (Jain and Nfila 2006:181). Chandra (2005:246) adds that the foundation of KM is the power of learning (Chandra 2005:246). Townley (2001) adds that in many ways, KM incorporates principles that academic librarians have developed and used with scholarly information for many years. It then applies these and other principles to organisational information in ways that create new knowledge to improve organisational effectiveness.

Academic librarians in Tanzania, as in other African countries, describe KM practices as the process of collecting, cataloguing and indexing explicit or documented knowledge (Jain 2007; Jain 2009; Mavodza 2010). Certainly, librarians already have the core IM skills required to manage knowledge once it becomes explicit. The process for explicit assets is to identify, catalogue and optimise the availability of artefacts in which the knowledge is stored (Chandra 2005). Tom Davenport believes that KM will not succeed if there are no workers and managers whose primary duties involve gathering and editing knowledge from those who have it, paving the way for operation of knowledge networks, setting up and managing technology infrastructure (Davenport 2005). Academic libraries are charged with the responsibility of carrying out all these practices. However, the question that arises is whether academic libraries have been practising KM or IM (Jain and Nfila 2006:181). Some of them may be striving to achieve that, but still remain a long way from a full KM society.

Gorman (2000:20) has formulated five laws of library science in regard to KM practices which include:

- (a) Libraries serve humanity;
- (b) Respect all forms by which knowledge is communicated;
- (c) Use technology intelligently to enhance service;
- (d) Protect free access to knowledge; and
- (e) Honour the past and create the future.

Referencing, cataloguing and other library services are designed to encourage the use of scholarly information to increase the amount of academic knowledge used in higher education. Townley (2001:46) explains that questions in a reference interview and the points of access in a catalogue are both intended to reinforce the ways that scholars work to create new academic knowledge. However, libraries have done little to use the organisational information to create knowledge that can be used to improve functionalities of libraries and their parent organisations (Townley 2001).

Jain and Nfila (2006:188) suggest that library staff can apply KM practices in their libraries, only if they are willing to transform themselves as well as transform their libraries into knowledge-driven organisations. Therefore, focusing on the application of KM practices, academic libraries serve humanity by equipping people with the right kind of knowledge and, thus, advance the well-being of humankind (Jain 2013:137). Through KM practices, academic libraries have an opportunity to collaborate with more people from various departments within and outside their organisations (Townley 2001:46).

### **1.1.2 KM practices and the role of KM enablers in academic libraries**

The foundation of KM is the power of learning. No organisation can improve without learning something new (Chandra 2005). KM is very critical for the management of organisational knowledge which is created daily within higher learning institutions. The majority of academic libraries employ KM practices to improve the quality of their services in this age of the knowledge economy (Kude, Nalhe, and Mankar 2012). KM is consistent with the currently emerging models within the organisations which involve people working in teams, coming together on a project basis, and moving on the new relationships (Chandra 2005).

There are various types of KM practices which include knowledge creation, knowledge internalisation, knowledge sharing, knowledge capturing, knowledge transfer, knowledge maintenance, and knowledge acquisition (Jain and Nfila 2006:181). This study has employed knowledge creation and knowledge sharing practices only. This is because knowledge creation and knowledge sharing practices make academic libraries to a better understanding of information and knowledge needs of the library users. Even though knowledge is created daily through learning, teaching, research and innovation, there is the lack of formalised structures for knowledge creation and sharing in the majority of academic institutions (Mosha, Holmner, and Penzhorn 2015). This can be achieved through the establishment of knowledge creation and sharing culture within higher learning institutions. Jain and Nfila (2006) assert that library staff should be leading in creating and sharing their knowledge and skills among themselves and with library users. Nevertheless, practically this element is missing, which is revealed by the research findings. Additionally, academic libraries under a KM environment need to create searchable repositories, libraries and databases of knowledge which will assist people who are looking for specific topics (Hislop 2013).

Knowledge creation and sharing practices need to be enhanced through the application of KM enablers. Lack of KM enablers hinders the application of KM practices (knowledge creation and sharing) in the majority of the academic libraries. There are different types of KM enablers such as ICT infrastructure, organisational structure and culture, KM policy and procedures, competencies and skills, KM training, and management support and leadership. The majority of academic libraries in Tanzania and in other Sub-Saharan African (SSA) countries lack KM enablers for the effective creation and sharing of knowledge (Jain 2007; Mavodza 2010). For example, there is a lack of KM policies and guidelines to facilitate the application of KM practices in academic libraries (Jain 2007). Most of KM policies and procedures, missions and visions which are available in libraries are not reviewed and updated regularly to accommodate the changes (Jain 2007). In addition, academic librarians need a mix of technical and organisational skills and competencies to help them handle information services to fully manage

knowledge, librarians need to have multidisciplinary skills to understand KM's holistic approach (Hislop 2013; Jain 2007; Mavodza 2010). To stress on the matter, Chandra (2005:255) adds that managing knowledge requires a mix of technical, organisational and interpersonal skills.

Currently, IT is regarded as the central part of KM enabler to facilitate KM practices (Hislop 2013). Jain and Nfila (2006:187) assert that IT can support and enable KM practices by providing the means for people to better organise, store, retrieve, disseminate and share explicit knowledge; and also, by connecting people through collaborative tools to capture and share knowledge. On the other hand, Lack of adequate ICT infrastructure is among the major challenges which most of the academic libraries in Sub-Saharan African (SSA) are facing today. Lack of management support and motivation to library staff involved in KM practices also discourage the requisite KM practices in the majority of the academic libraries (Mosha, Holmner, and Penzhorn 2015). Therefore, to enjoy the whole potential of the academic libraries, as well as, the librarians need to be encouraged and supported to participate in KM practices.

### **1.1.3 The application of Web 2.0 tools in academic libraries**

The application of Web 2.0 tools has become an integral part of our everyday activities. The emergence of these tools has changed the ways on how academic libraries in Tanzania and in other African countries provide services to library users. The argument was also supported by Levy (2009) who asserts that the emergence of Web 2.0 tools has changed the ways academic libraries are performing their duties by helping people to participate in dialogue and discussion and then contribute their knowledge to interpersonal and community discussions (Levy 2009). Libraries worldwide are, therefore, increasingly adopting Web 2.0 tools to improve library services. The Web 2.0 environment brings unprecedented challenges to libraries.

Tripathi and Kumar (2010:190) state that "Earlier academic libraries were "place-based" service providing institutions and users visited the library to consult the catalogue and use the physical collection of books, journals, CDs, and other products". Therefore, with the emergence of Web 2.0 tools, academic libraries has been completely transformed (Tripathi and Kumar 2010:190). Levy (2006) asserts that the emergence of Web 2.0 tools has changed the way academic libraries are performing their duties by helping people to participate in dialogue and discussion and then contribute their knowledge to interpersonal and community discussion. Curran, Murray, and Christian (2006) add that the access and use of Web 2.0's principles and technology offer academic libraries opportunities to serve their audiences where they are and in association with the tasks that they are undertaking. One of the main aims of Web 2.0 tools is to encourage feedback and participation from users.

The access and use of Web 2.0 tools help academic libraries to improve the quality of their services to develop an interactive and content-rich web presence for libraries (Kim and Abbas 2010; Penzhorn and Pienaar 2009; Mendes, Quinonez-Skinner, and Skaggs 2009). Akeriwa, Penzhorn, and Holmner (2014) add that academic libraries worldwide are increasingly adopting a variety of Web 2.0 tools and applications to deliver more effective and accessible services to their clients. Therefore, there is an undisputed need for academic libraries in developing countries to start using Web 2.0 tools as those in the developed world. Jain (2013:134) adds that:

Today we are in the digital era...with the emergence of Web 2.0, Library 2.0, RSS, Blogs, Wikis, SMS, Podcasting, Mashups, Tagging, Folksonomies, OSS, OA, and other tools., libraries worldwide have been adjusting to a shift from the printed era to the digital era.

The application of ICT and Web 2.0 tools in the most of the academic libraries in developing countries is still slow and unplanned (Lwoga 2013; Makori 2012). Most of the academic libraries in South Africa are highly advanced in using Web 2.0 tools for the library services. For example, the University of Pretoria (UP) Library in South Africa is using Web 2.0 tools to facilitate reference services and information literacy learning (Penzhorn 2013; Penzhorn and Pienaar 2009). On the other hand, there are few libraries in Tanzania which are using Web 2.0 tools. For example, MUHAS Library employed a number of Web 2.0 tools such as Blogs (for delivering health content through online search tool to search for e-resources at the library website, posting information on a training schedule and facilitate online tutorials on information searching techniques) and Wikis (to support learning and information literacy and to provide online training modules and annotated links on various topics (Lwoga 2013:291). Other library activities which could be supported by the application of Web 2.0 tools include the creation of online catalogues, social bookmarking, collaborating, and content sharing (Muneja and Abungu 2012).

Generally, the majority of academic libraries in Tanzania still operate mainly on a 'traditional' basis where the bulk of the key functions are carried out manually. As mentioned, few academic libraries have started using various Web 2.0 tools to varying degrees (Muneja and Abungu 2012), and others have been conducting Web 2.0 tools training to equip and engage their library employees with requisite knowledge and skills about Web 2.0 tools (Lwoga 2013; Muneja and Abungu 2012). Therefore, much effort is still needed to enhance the application of Web 2.0 tools in academic libraries in Tanzania, especially on facilitating KM practices.

In accordance with this study, Web 2.0 tools were regarded as KMS employed to enhance KM practices in academic libraries. Alavi and Leidner (2001), as well as Lwoga (2013), assert that Web 2.0 tools are sometimes regarded as KMS which allow and enhance knowledge creation and sharing among users. According to Chandra (2005), the application of Web 2.0 tools to enhance KM practices are:-

- (a) To network with people across the organisation through the application of Web 2.0 tools. This can enable people to gather and share relevant information/knowledge and to build trust and relationship among them;
- (b) To facilitate collaborative environment by encouraging people to identify and publish relevant ideas and observations for distributions;
- (c) To enhance the contribution and sharing of both tacit and explicit knowledge;
- (d) To enable both tacit and explicit knowledge to be shared ‘virtually’ throughout the organisations;
- (e) To exercise traditional ‘management’ skills such as leadership and motivation, and influence various skills necessary for constantly changing environment today;
- (f) To create links between disparate, but connected bits of information and knowledge across the organisation;
- (g) To integrate separate document management, the library and other databases into a single KMS;
- (h) To facilitate information learning literacy within academic environment;
- (i) To run organisation’s business, its function flows, strategic plans, people and processes; and
- (j) To enhance the transfer, management and the use of knowledge available within the organisation.

Thus, the application of Web 2.0 tools in academic libraries facilitates KM practices as well as improving the quality of library services such as enhancing online collaboration and communication, marketing and promoting library services, reference services and provide library news (Lwoga 2013; Penzhorn 2013; Penzhorn and Pienaar 2009).

#### **1.1.4 Changing academic libraries’ roles**

Academic libraries transform their spaces from book storage to knowledge and learning spaces to accommodate the growing number of students. Library spaces which were reclaimed from bookshelves need to be redesigned to facilitate a collaborative learning as well as provide the ready access to resources in both printed and electronic forms, learning technologies, library assistance, and other services such as writing centres or counselling support.

The primary function of academic libraries is to act as KR and an agent for the dissemination of knowledge (Kim and Abbas 2010:211). Academic libraries are sometimes known as the “learning

building” (Foo, Majid, and Logan 2002). Academic libraries are positioning themselves to be the learning and research centres of universities. Currently, most of the academic libraries’ roles are changing due to the emergence of ICTs and other technological tools such as Intranet, Web 2.0 tools, and social media tools. Through the application of ICTs, the majority of academic libraries take on the key role of providing the “competitive advantage” for the parent organisations (Foo, Majid, and Logan 2002). Currently, most of the scientific libraries are equipped with electronic management systems such as Online Public Access Catalogues (OPACs) which can be accessed via the Web. For example, the OPAC has to be equipped with delivering services for electronic documents stored in academic libraries (Chandra 2005). Foo, Majid, and Logan (2002) provide that digital reference services using email, Web forms or video-conferencing have been tested and implemented in a number of academic libraries.

Further, academic libraries have a long tradition in collecting documents and delivering information to users; however, such services are now replaced by online document delivery services. Foo, Majid, and Logan (2002) argue that in the majority of academic libraries, the online document delivery service requests need to be accompanied with credit card payments to better serve the needs of academic users. There is a need for academic libraries to find means of producing online services at low cost or for free to satisfy the needs of library users.

Online reservation and renewal of library materials were also becoming part and parcel of library automation systems, especially in the new generation of Web-based systems that replaced the older traditional standalone proprietary library systems (Chandra 2005). More typically, traditional paper-oriented scientific libraries are extended with digital documents, forming so-called ‘hybrid’ libraries (Chandra 2005). Extensive collections, especially of scientific and technical information (STI), together with education are essential for modern information societies to assure economic wealth.

Academic libraries need to operate in a modern information environment where information literacy is encouraged so that scholars can use such information for knowledge creation, transfer and sharing (Mavodza 2010). Librarians are responsible for managing information and teach library users on how to access, retrieve and use information (information literacy learning) in academic libraries (Penzhorn 2013). Mavodza (2010) explains that librarians must play major roles in information literacy activities to help library users to locate, access, and use information for their academic and, possibly, individual needs. In addition, the way towards achieving the teaching and educational goals of colleges are inadvertently impacted upon (Mavodza 2010).



The concept of ownership of items has become more fluid because of the emergence of Web 2.0 tools that include social software like Blogs and Wikis, MySpace, Flickr, and collaboration platforms such as Wikipedia (Mavodza 2010). Thus, academic libraries must utilise Web 2.0 tools to expand their services, especially as there are documents and resources from both internal and external sources. Academic courses in the majority of academic institutions are ranging from hands-on practices to cooperative/collaborative learning underpinned by the constructivist paradigm.

Constructivist teaching and learning in the majority of the academic libraries fosters critical thinking and creates motivated and independent learners (Penzhorn and Pienaar 2009). Lwoga (2013:3) explains that Web 2.0 technologies can support constructivism-oriented pedagogical approaches such as active learning, social learning, and student publication, by providing environments and technologies that promote and foster these interactions. Thus, Web 2.0 technologies are appropriate for active and meaningful learning and collaborative knowledge building (Majhi and Maharana 2010). Chandra (2005) mentions some of the new roles in academic libraries which include the following:-

- (a) Be combined with computing centres into knowledge service centres with a chief information officer /chief knowledge officer who is responsible for representing knowledge services and infrastructure at the university's top executive level;
- (b) Develop personalised services such as recommender systems to be used. The expected benefits are to improve service quality and accessibility of literature by students and researchers. The development of such services benefits from the established network infrastructure and a large number of current users. The critical mass of users necessary to justify the development of automated recommendations using statistical methods is already met by academic libraries. Such services can be offered with relatively small investments in additional infrastructure, hardware, software and with small incremental operating costs; and
- (c) Develop improved document inventory management systems to enhance the availability and timely delivery of documents according to the preferences of library users. Such services are usually developed as a by-product of personalised services and are based on the same infrastructure.

## **1.2 Research problem**

Leedy and Ormrod (2010:27) explain that research problem is the heart of the research process. Therefore, it is important to describe the problem precisely, as the goals and objectives of the study are

derived from this point. According to Herson and Schwartz (2007), problem statement of any research project should communicate the study's importance, benefits, and justification.

Knowledge is created daily in academic institutions through teaching, learning, research and innovation, but, such knowledge is not well managed and preserved for future use. Like in many other developing countries, lack of KM strategy is among the critical challenges facing most of the Tanzanian academic libraries. In the first instances, Tanzanian academic librarians have been facing a number of challenges to implementing KM practices. Among the challenges face by academic librarians in Tanzania are financial instability, misunderstanding of KM concepts, lack of resources for KM implementation and lack of KM enabling technologies (Moshia, Holmner, and Penzhorn 2015).

Lack of KM enablers (or influencing factors) and awareness of what KM entails hinder the application of KM practices in the majority of academic libraries in Sub-Saharan Africa (SSA) (Jain 2007; Maponya 2004; Townley 2001). In accordance with this study, KM enablers include competencies and skills, IT support, organisational culture, knowledge sharing culture, management support, and motivation of employees to participate in KM practices. The majority of Tanzanian academic libraries lack KM enablers to facilitate the application of KM practices. Lack of individual commitment and willingness to participate in KM practices are among the reasons for unreliable KM enablers in place.

Despite the advantages of KM practices, the majority of employees are reluctant to participate in KM practices. Levy (2009:127) adds that "too many passive employees are encountered, whether managers or employees, all understanding the importance of KM, yet not having the time or the attentiveness to join in". Mavodza (2010) adds that only a few academic libraries have begun to appreciate the power of the KM practices however the implementation is still in its infancy in most academic libraries. However, academic libraries have done little to use the organisational information to create knowledge that can be used to improve the functionality of such libraries and higher institution processes. There is, therefore, a need for them to ensure the creation and sharing of knowledge.

There is also a need to incorporate KM enabling technology to facilitate the implementation of KM practices in academic libraries. Lack of KM enabling technologies hinders the application of KM practices in the majority of academic institutions in Tanzania (Moshia, Holmner and Penzhorn 2015). Hislop (2013:207) asserts that roles for ICT-enabled KM build on the twin assumptions which are: knowledge can be codified and that once codified it can be transferred and shared between people via various Web 2.0 tools. The majority of academic libraries worldwide have recognised the importance of

Web 2.0 tools to fulfil the knowledge needs of their academic communities. However, little is known so far about the access and use of Web 2.0 tools in academic libraries in Tanzania and in other parts of Africa (Akeriwa, Penzhorn, and Holmner 2014; Kwanya, Stilwell, and Underwood 2012; Lwoga 2013; Lwoga 2014; Penzhorn 2013; Si, Shi, and Chen 2011). On the other hand, lack of KMS models diminishes the application of KM practices (Hosseini and Hashempour 2012; Jennex and Olfman 2003; Kim and Abbas 2010; Levy 2009; Lwoga 2013; Paroutis and Al Saleh 2009; Schneckenberg 2009). In this study, Web 2.0 tools were regarded as KMS employed to enhance the application of KM practices in academic libraries.

Therefore, it is evident to investigate the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania. This study has examined the role of KM enablers for the application of KM practices, the advantages and application of KM practices in academic libraries, the role of Web 2.0 technologies to support the implementation of KM practices, the challenges that hinder the application of Web 2.0 tools to enhance KM practices in academic libraries, and the access and use of Web 2.0 tools to enhance KM practices and to improve academic libraries services.

The study has employed KMS Success Model which was adapted from Jennex and Olfman KMS Success Model, modified and then validated to fit in this study. KMS Success Model has investigated the factors that affect the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania. Academic Library 2.0 model, knowledge creation model/Socialisation, Externalisation, Combination, and Internalisation (SECI) model and Web 2.0 Driven SECI Model were used to determine the application of Web 2.0 tools to enhance KM practices in academic libraries. This has become very necessary as though there have been studies on the application of Web 2.0 tools to enhance KM practices, the available literature does not mention any proposed KMS model for academic libraries.

### **1.3 Research purpose**

The aim of this study was to investigate the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania. In this study, KM practices involve knowledge creation and knowledge sharing.

#### **1.3.1 Objectives of the study**

The specific objectives of the study were as follows:

1. To determine the level of KM awareness among library staff in academic libraries in Tanzania;
2. To assess the application and benefits of KM practices in academic libraries;

3. To examine the key KM enablers for the application of KM practices in academic libraries in Tanzania;
4. To examine knowledge creation and knowledge sharing practices in academic libraries;
5. To investigate the access and use of Web 2.0 tools in academic librarians in Tanzania;
6. To assess the application of Web 2.0 tools for KM implementation in academic libraries in Tanzania;
7. To investigate the factors that affect the application of Web 2.0 tools in KM practices in academic libraries; and
8. To determine the challenges that hinder the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania.

### **1.3.2 Research questions**

The specific questions for the study were as follows:

1. What are the levels of KM awareness among library staff in academic libraries in Tanzania?
2. What are the applications and benefits of KM practices in academic libraries in Tanzania?
3. What are the key KM enablers for the application of KM practices in academic libraries in Tanzania?
4. What are the activities conducted to enhance the creation and sharing of knowledge in academic libraries in Tanzania?
5. How can Web 2.0 tools be accessed and what are the uses of Web 2.0 tools in academic libraries in Tanzania?
6. To what extent does the application of Web 2.0 tools for the KM implementation in academic libraries in Tanzania?
7. What are the factors that affect the application of Web 2.0 tools to enhance KM practices in academic libraries?
8. What are the challenges that hinder the application of Web 2.0 tools to enhance KM practices in academic libraries?

### **1.4 Justification for the study**

Once a research problem has been identified and the purpose of the research has been established, the next step is to convince the research community on the importance of tackling the particular research problem. Justification of a study explains the importance of the study to the community (Creswell 1994).

Fisher and Foreit (2002) set out a series of questions that could help researchers in providing the justification of the research project. The questions are listed below:-

- (a) Is the problem you wish to study a current and timely one? Does the problem exist now?
- (b) How widespread is the problem? Are many areas and many people affected by the problem?
- (c) Who else is concerned about the problem? Are top government officials concerned? Are other professionals concerned?
- (d) Does the problem relate to broad social, economic and other issues such as unemployment, income distribution, poverty, the status of women, or education?

This study has investigated the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania. It outlined the importance of integrating Web 2.0 tools to facilitate KM practices in academic libraries. In other words, this study has investigated how KM practices function under the light of Web 2.0 tools (Levy 2009).

Dalkir (2005) asserts that KM is the systematic coordination of people, technologies, processes and organisational structure to enhance organisations and to reuse knowledge and innovation for the development of such organisations. Dalkir (2005) adds that the coordination of people using KM practices is achieved through the creation, sharing, and application of knowledge. Further, Nelson (2008) adds that Web 2.0 tools are collaborative tools designed to improve the exchange of knowledge and productivity. Thus, the development of Web 2.0 tools is believed to enhance KM practices in various ways.

Academic libraries need to apply KM practices with the integration of Web 2.0 tools to facilitate the creation, sharing, communication and use of knowledge (Bem, Coelho and Reinisch 2013) As it has been reported before, knowledge became an important resource in comparison to other resources such as land, minerals and capital (Drucker 1995;Maponya 2004). This is because knowledge is the controller and/or the guide to other important resources worldwide. Therefore, the change of emphasis on knowledge and, therefore, on KM is a logical progression in the hierarchy of knowledge that information professionals have adopted (Kabede 2010).

Kabede (2009) adds that this current shift which focuses on knowledge have been established since the early days in the IS professional field, and professionals have been working and positioning themselves for this change, although mostly without having a clear notion of how long it would take to reach this goal. The progression is considered to be a logical thing, once it is understood that KM is the result of the practices accumulated from the previous stages that form the basis for this higher stage.

Che Rusuli, Tasmin, and Takala (2012) assert that the impulse to embrace KM in academic libraries arises primarily from a combination of the budget deficit and ever increasing expectations of users. One can clearly see that the environment in which academic libraries operate is changing. While facing the challenges and opportunities, academic libraries need to come up with a response to better serve the needs of the academic community. One way to do this is by engaging in KM practices which include creating, capturing, sharing and using knowledge within the organisation (Che Rusuli, Tasmin, and Takala 2012).

The application and benefits of KM practices in academic libraries have been discussed and accommodated by various authors (Dong 2008; Jain 2007; Maponya 2004; Mavodza 2010; Townley 2001). Dong (2008) explains that KM in academic libraries has the following levels: the conversion of large amounts of knowledge locked inside the minds of employees (tacit knowledge) with, the idea to turn them into explicit knowledge (through codification process) and make them visible by facilitating access and its uses throughout the library (technological tools), and to enhance collection, preservation, access, and records (traditional library resources). In general, KM includes the collection and distribution of library resources such as acquisitions, cataloguing, circulation, scanning, interlibrary loan and dissemination of library resources.

The study has established the interrelationship between KM and librarianship. Che Rusuli, Tasmin, and Takala (2012) add that there is a mix of feelings and undecided attitude on the relationship between KM and Information Systems (IS), some support KM as a field of IS, which has been practised by librarians for a long time; and some are not. Additionally, Roknuzzaman and Umemoto (2009) explain that both KM and IS are interdisciplinary and are concerned with the identification, acquisition, capture, processing, storage, retrieval and use of knowledge. Because of its multidisciplinary nature and emerging perceptive variables, there is no general agreement on this definition, nor is there a standard framework to provide a common platform. Thus, there is a need to incorporate KM practices to support various library services and to employ tools which could facilitate the implementation of KM. IS, on the other hand, needs to be employed to ensure the functionalities of KM practices within academic libraries.

This study has established the need of KM enablers for the application of KM practices in academic libraries. Appropriate KM enablers are important to ensure that the alignment of organisational process, organisation culture, training, management support and IT deployment produce effective knowledge creation and sharing within the institution (Choi, Poon, and Davis 2008:236). Higher learning institutions and their libraries need to be clear of the KM enablers that influence KM practices (Yeh, Lai, and Ho 2006). In this study, KM enablers were also regarded as influencing factors or motivators employed to enhance library staff to effectively participate in KM practices.

Among the KM enablers established in this study include IT infrastructure, management supports, competencies and skills, and organisational culture. This study concurs with Lin, Hung and Wu's (2002) idea in the terms of technology (IT infrastructure/support), human resource (management support, KM policy and guidelines), culture (organisational culture), and people (trust, competencies and skills and motivation). Thus, to ensure the success of KM practices within academic libraries, it is crucial to acquire the key KM enablers so as to make it possible to effectively utilise institutions' limited resources, reduce the use of manpower, materials and time to achieve the expected results (Yeh, Lai, and Ho 2006).

The study has established the application of models and/or theories to explain the application of Web 2.0 tools to enhance KM practices. Therefore, it has employed both KM and Web 2.0 theories and models. Daneshgar and PARIROKH (2012) add that besides the analytical tools that help library staff to provide innovative services, conceptual models are important due to the amount of information and knowledge that librarians manage. The study employed Academic Library 2.0 model, knowledge creation/SECI Model, and Web 2.0 Driven SECI Model.

The study has employed the KMS Success Model to investigate the factors that affect the application of Web 2.0 tools to enhance KM practices in academic libraries. The use of KMS Success Model is acknowledged by various authors in KM concept (Delone and Mclean 2002; Delone and Mclean 2004; Jennex and Olfman 2004; Lwoga 2013; Wang 2008; Wu and Wang 2006). The study adapted and validated Jennex and Olfman (2003) KMS Success Model. Jain (2013) adds that universities are looking into the possibility of applying KMS Success Model.

## **1.5 Originality of the study**

Research originality is a core aspect of any postgraduate research. This can be described as the original contribution to scholarship or simply something no one else has done before (Cryer 2000). Guetzkow and Lamont (2004) acknowledged the role of originality in knowledge building, but explain that it goes beyond the research itself and reflects the researcher's authenticity throughout the research process. Their

findings indicate that originality can occur in varied forms in social context. Investigating understudied areas was identified as a means of developing original research that could be of significance to a particular discipline.

This study has looked at studies which have previously been done in Tanzania and in other countries by looking at; benefits and challenges of Web 2.0 applications and KM practices. Until the time of this research, there has been no research on the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania. However, there has been a number of studies in Tanzania which had investigated the access and use of Web 2.0 tools to enhance KM practices (Lwoga 2013; Lwoga 2014; Muneja and Abungu 2012). There have been also a few studies which have linked Web 2.0 tools/social media tools and knowledge sharing in Tanzania (Mosha, Holmner, and Penzhorn 2015; Mtega et al. 2014). Thus, this aspect of research remains largely unexplored in Tanzania and in Africa in general. Therefore, there was a need to investigate the application of Web 2.0 tools to enhance KM practices in academic libraries.

This study has investigated the application of Web 2.0 tools to enhance KM practices in academic libraries. KM practices include knowledge creation, sharing, preservation, acquisition and capturing (Maponya 2004; Townley 2001). Knowledge creation and sharing practices have been categorically employed in this study. The use of knowledge creation and sharing practices in academic libraries has made this study original. This is due to the fact that knowledge is created daily in higher learning institutions through teaching and learning activities, research and innovation. However, such knowledge has not been identified, organised, documented and shared well. This can lead to knowledge loss in higher learning institutions.

Much of the knowledge created in higher learning institutions belongs to the creator or owner of such knowledge and, thus, it is the decision of the creator/owner to share their knowledge. Therefore, the application of Web 2.0 tools is believed to minimise most of the problems and facilitates the flow, access, retrieval and sharing of knowledge in higher learning institutions. Knowledge sharing could lead to the creation of new knowledge which is then accessed, retrieved, shared, and stored for future use. Additionally, the application of KM enablers to facilitate the application of KM practices in academic libraries makes this study original. This is due to the fact that, most of KM studies in academic libraries do not employ KM enablers. The use of various KM enablers such as KM policy and procedures, organisational culture, IT infrastructure and rewards are believed to speed up the application of KM.



This is the first comprehensive study focused on academic libraries, and which has used four models namely: Academic Library 2.0 Model, Knowledge Creation/SECI Model, Web 2.0 Driven SECI Model and KMS Success Model to explain the library staff's behaviour on the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania; and thereafter reveals the findings that are useful for planning and implementing Web 2.0 and KM initiatives in other institutions with similar conditions. Most of the studies used SECI Model (Chou et al. 2010; Lopez-Nicolas and Soto-Acosta 2001; Ramírez, Morales, and Aranda 2012) and Web 2.0 Driven SECI Model (Shang et al. 2011) provide the details on how SECI Model enhances knowledge creation only. The application of these models in this study facilitates the creation and sharing of knowledge in academic libraries, and thus makes this study original.

## **1.6 Significance of the study**

The significance of the study shows its contribution to a particular field of knowledge. Identifying who will benefit from the study and how they will benefit is the key point (Smith 1998). This can be done by highlighting how a study can:- address gaps in a particular field of knowledge, develop better research strategies in the field of knowledge, influence policy or change the way people do things (Smith 1998).

This study is of significance in the area of Web 2.0 applications and KM practices as it extends the knowledge base that currently exists in the field of information science. The study is the most comprehensive research to investigate the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania; and the access and use of Web 2.0 tools to improve other library services as well. As a matter of fact, not much has been done in the Tanzanian context with regard to the application of Web 2.0 tools and KM practices, especially in academic libraries.

Further, the implication of Web 2.0 tools toward KM practices in most of the academic libraries has not been widely investigated (Islam, Agarwal, and Ikeda 2014; Trivedi 2007; Totterman and Widen-Wulff 2009). Therefore, this study has explored the current practices, identified challenges and adapted and modified a conceptual framework that explores factors that affect the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania. The findings of this study have provided an approach which could be used to improve the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania. Thus, this study is significant to:-

- (a) The academic librarians, as the custodians of the knowledge, would like to see the creation of knowledge, knowledge sharing, and preservation of knowledge. The provision of Knowledge Creation/SECI Model could accelerate this process.

- (b) Academic libraries to integrate Web 2.0 tools to facilitate the creation and sharing of knowledge and to support the access and use of such tools among their users and staff. The provision of Web 2.0 SECI Driven Model could accelerate this process.
- (c) ICT professionals and system librarians to identify the factors affecting the application of Web 2.0 tools to enhance KM practices in academic libraries. The application of KMS Model could facilitate the process.
- (d) Policy makers and academic libraries planners to recognise the need to understand and implement Web 2.0 tools and KM practices with conventional knowledge and its role in decision-making processes. The study was thus of significance by providing a framework for the policy makers on how to improve the application of Web 2.0 tools and KM practices in academic libraries.
- (e) Web 2.0 tools and KM literature whereas the findings of this study could shed light on KM practices and the use of Web 2.0 tools in Tanzania and in Africa in general.

### **1.7 Definition of terms**

This section provides the definition of the key terms used in this study. Precision in the use of language and terms is necessary and, hence, to constitute good science, the need to ground thoughts in authoritative definitions is necessarily done (Creswell 2003:43). Therefore, contextual definitions of terms used in this study include the following:-

#### ***Academic librarian***

An individual who manage, organise, evaluate and disseminate information, providing support to members of the higher learning institutions, colleges and universities including students, researchers, and lecturing staff to identify, recognise, retrieve, use, share and disseminate their needed information in an academic library. Their roles involve facilitating and supporting learning by teaching information retrieval skills to students and staff within classrooms or virtual learning environments (United States Department of Labor 2009).

#### ***Academic library***

A department which is established within higher learning institution to support the mission of the parent institution and to provide information and knowledge to serve the needs of stakeholders within a higher learning institution (Wen 2005).

### ***Knowledge management***

The process of creating, storing, sharing, acquiring and re-using organisational knowledge (know-how) to enable an organisation to achieve its goals and objectives (White 2004). KM is an ongoing process, which comprises four KM processes: create KR, improve knowledge access, enhanced knowledge environment and manage knowledge as an asset (Townley 2001).

### ***KM practices***

Activities which deal with identifying, managing, utilising and sharing organisational knowledge (tacit and explicit) through the application of reliable tools and techniques (Kude, Nalhe and Mankar 2012). KM practices include knowledge generation, knowledge creation, knowledge sharing, knowledge retrieval, knowledge transfer, knowledge application and knowledge sharing (Kude, Nalhe and Mankar 2012).

### ***Web 2.0 tools***

Second generation of the worldwide web, describing a series of technologies based on seven underlying principles the Web as platform, harnessing collective intelligence, data is the next Intel inside, end of the software release cycle, lightweight programming models, software above the level of single device, and rich user experiences (O'Reilly 2005).

## **1.8 Research design and methodology**

The research design and methodology of this study are informed by the research paradigm. A research paradigm is used to inform the type of methodology a research decides upon. Paradigm, when used in social sciences, is regarded as a set of assumptions about the social world and about what constitute proper techniques and topics for inquiry (Punch 1998:28). The quantitative methodology is informed by positivism paradigm; while qualitative one is based on the interpretivism paradigm.

This study has employed positivism paradigm because positivists believe that the world is a fixed entity whose mysteries are not beyond human comprehension, therefore their findings are always quantitative, statistically significant and generalisable. On the other hand, this study has employed interpretivism paradigm because it deals with the issue of human complexity by directly exploring it. Interpretivism emphasises the inherent complexity of humans and their ability to shape and create their own experiences and idea that truth is a composite of realities (Polit and Beck 2003:26). This study has conducted a deep investigation by interviewing key informants (libraries' heads and other senior staff in academic libraries) to get in-depth information about the problem. This means that the researcher had physically visited the

field area to collect in-depth information about the research problem from participants who can tell their stories about the problem being investigated (epistemological assumption).

The study has employed multi-method research to validate data and the study findings by combining a range of data sources methods or observers and widening the scope of the study to take in contextual aspects of the situation (Tashakkori and Teddlie 1998). The multi-method approach involves the use of two or more research methods within a single methodology or worldview in the tradition of methodological triangulation (Denzin 1970). In this study, questionnaire (quantitative), semi-structured interview and observation (qualitative) were employed to collect data. Further, the study employed between-method triangulation whereby qualitative data was used to corroborate the findings obtained from quantitative data. Between-method triangulation adds credibility of the obtained findings and to provide different perspectives on the same phenomenon as well.

Eight out of twelve academic libraries located in public universities were purposively selected in this study. These academic libraries were selected from registered public universities located in various regions in Tanzania. This study has focused on academic libraries situated in public universities on the understanding that: they are funded by the government and, therefore, they are public entities and are obligated to make their operational procedures available to the public. Other selection criteria included: - ICT status of infrastructure and resources, the number of qualified and permanent staff, the notion of well-equipped libraries, the presence of undergraduate and postgraduate programmes, and the status of serving the community for not less than ten years.

The target population of this study was the library staff working in the selected academic libraries. This study employed two categories of samples: normal library staff and senior staff (directors, heads of libraries, managers, human resources personnel, and heads of ICT departments). The participants from the first category (normal library staff) were selected by using systematic probability sampling technique; while participants in the second category (senior library staff/ key informants) were purposively selected.

This study used a statistical power analysis software package known as Sample Size Calculator of Creative Research System to calculate the sample size for quantitative data (Creative Research Systems 2003). The sample size for the participants involved in a qualitative data collection ranged from 5 to 12 from each library. The sample size for a qualitative approach from each library depended on when the researcher reached a saturation point. That means, a point of diminishing return to a qualitative sample as the study was carried out, more data did not necessarily lead to more information (Creswell 2007; Polit

and Beck 2003). The quantitative data was analysed by using SPSS software Version 21 and the qualitative data was analysed thematically (thematic analysis). A Measurement Model and Structural Equation Modelling (SEM) were tested by using AMOS 23. The research methodology is discussed in detail in Chapter Four.

## **1.9 Scope and delimitation of the study**

Scope and limitation of the study are the boundaries of the study or what the study has covered (Kothari 2004). The following sub-sections discuss the scope and limitations of this study.

### **1.9.1 Scope**

This study has investigated the application of Web 2.0 to enhance KM practices in academic libraries in Tanzania. This research has highlighted its foundation based on the Academic Library 2.0 Model, Knowledge Creation Theory (SECI Model), Web 2.0 Driven SECI Model and KMS Success Model. The Adaptive Structuration (AST) Theory, Organisational Creativity Theory (OCT), and Theory of Reasoned Action (ACT) were regarded and used as cornerstones of this pragmatic research. The study has also discussed the empirical findings based on the application of Web 2.0 tools and KM practices in academic libraries settings.

### **1.9.2 Limitation**

The study has investigated the academic libraries in the public universities. There are twelve academic libraries in twelve public universities in Tanzania. However, some of the public universities have several constituents or university colleges. Due to the time limit and resources constraints, this study has just investigated eight academic libraries situated in the main campuses. On the other hand, the four universities were excluded from this study because they were below five years since their inception at the time of this research's field work. This is also supported by the study done by Dulle (2010) which stated that "It is expected that universities that have existed as higher learning institutions for not less than at least 10 years and run postgraduate programmes have comparatively well-established research infrastructure, generate more research output and, hence, are likely to benefit more than new institutions". The generalisations of research findings and recommendations obtained will be available and applicable to all academic libraries (academic and private institutions) in Tanzania.

### **1.10 Ethical considerations**

Ethical consideration is very critical to research because most of the research touches various professions and each profession has its ethics. Cohen, Manion, and Marrison (2007) assert that ethical considerations are essential aspects of any research. Ethics pervades each stage of the research process which includes

data collection, data analysis, reporting and dissemination of research findings (Sekaran 2003:18). Creswell (2003:63) explains that ethical issues arise when specifying the research problem, purpose statement and research questions, and collecting, analysing, and writing up the results of data.

UNISA has a code of ethics with regard to research ethics (UNISA 2010). Therefore, as a student of UNISA, the researcher's plan was in accordance with the UNISA Research Ethics Policy. This policy provides clear guidelines with regard on how to deal with research activities. For instance, it outlines the importance of integrity, transparency, and accountability. To uphold this, the researcher provided the informed consent forms to participants, clearly stated the benefits and risks of doing the study as stipulated in the policy.

The study has involved the collection of data in different stages, matters of anonymity and confidentiality applied differently at different stages. The researcher had made sure that the participants were informed that the data gathered would be treated as confidential and used for the research purposes only. The audio files generated from the interviews and the completed questionnaires will be kept under lock and key for a period of five years.

### **1.11 Outline of the thesis**

The outline of the present thesis is based on the guidelines and suggestions from the literature (Babbie and Mouton 2001; Creswell 2007; Leedy and Ormrod 2005; Teddlie and Tashakkori 2009). The thesis is divided into seven chapters as presented below:

**Chapter One** introduces a background to the study starting with an introduction and background to the study, research problem, research purpose and objectives, research questions, justification of the study, scope and limitation of the study, ethical consideration, and layout of the thesis. The facts underpinning the originality of this study are also discussed in this chapter.

**Chapter Two** describes the area where the study has been carried out and the reasons for selecting such a specific study area for this research. It also explains the background of higher learning institutions and academic libraries in Tanzania, and the profile of the selected academic libraries. Lastly, it provides an overview of ICT infrastructure in Tanzania.

**Chapter Three** consists of the review of literature related to the area of the study by revealing what has previously been done on the topic and what was proposed to be done in this study. This chapter has also provided the theoretical foundation as applied in the study.

**Chapter Four** dwells on research methodology that has guided this study, including details on the research design and research methods.

**Chapter Five** presents the findings of the study.

**Chapter Six** discusses the findings of the study as described in chapter four.

**Chapter Seven** presents the summaries, conclusions, and recommendations of the study. The chapter proposes areas for further research. Finally, appendices were placed at the end of the thesis and they have included data collection instruments and acceptance letters for data collection.

#### **1.12 Summary of the chapter**

This chapter has introduced the core research problem of the study and then laid down the foundation of the rest of the chapters as presented in this thesis. The chapter presents the general background of the study, research problem, research purpose, objectives and research questions. Further, this chapter discusses issues related to the significance and assumptions of the study, scope and delimitations of the study, a brief outline of the methodology, and also the ethical issues.

## **CHAPTER TWO**

### **THE CONTEXT OF THE STUDY**

#### **2.0 Introduction**

This chapter discusses the context of the study. The chapter provides a short description of Tanzania and an overview of higher learning institutions. It also discusses academic libraries as well as an overview of ICT infrastructure in Tanzania.

#### **2.1 United Republic of Tanzania: an overview**

The United Republic of Tanzania is among the East African countries together with Burundi, Kenya, Rwanda, and Uganda. Tanzania is the largest country in East Africa with a surface area of 945,087 square kilometres (URT 2005). Tanzania is bordered by Kenya and Uganda to the north; Burundi, Rwanda and the Democratic Republic of Congo to the west; The Indian Ocean to the east; and Zambia, Malawi and Mozambique to the south (URT 2005). Tanzania came into being after the union of Tanganyika (Tanzania mainland) and Zanzibar (Tanzania Islands). Tanzania mainland is divided into 25 regions and Zanzibar is divided into 5 regions. The country is further subdivided into 169 districts (URT 2012).

According to the 2012 national population census, Tanzania has a population of 44,928,923 million, where 21,869,990 million people are male and 23,058,993 million are female (NBC 2012); whereas Tanzania mainland has 43,625,354 million people comprised 21,239,313 million of the male and 22,386,041 million of the female. Zanzibar has a population of 1,303,569 million comprised 630,677 million of male and 672,892 million of the female (NBC 2012). Figure 2.1:1 presents the map of Tanzania.





Figure 2.1:1 Map of Tanzania.

Source: <http://www.infoplease.com/atlas/country/tanzania.html/>

## 2.2 Higher learning institutions in Tanzania: an overview

The history of higher learning institutions in Tanzania started in 1926 when the Makerere college was established and then affiliated to the college of London University in 1949 (TCU 2005). The Dar-es-Salaam University College was established on 1 July 1970 (TCU 2005). However, Dar-es-Salaam University College did not meet the national demand for the professionals needed for the development plans of the country (TCU 2005). Therefore, the government of Tanzania reversed the Musoma Resolution and established two other public universities; Sokoine University of Agriculture (SUA) in 1984 and The Open University of Tanzania (OUT) in 1993 (TCU 2005).

The government established the Ministry of Science, Technology and Higher Education (MSTHE) (currently known as the Ministry of Higher Education, Science and Technology) in 1990, to coordinate higher education in Tanzania. MSTHE is responsible for coordinating and overseeing policies of Higher Education, Technical Education and Technology (Msolla 2006). Among the critical areas of this ministry

is to oversee the application of ICTs to enhance various activities as conducted within Tanzanians' higher learning institutions.

Msolla (2006) explains that “Thus, education including the application of information and communication technology (ICT) shall continue to rank high in our efforts to ensure sustainable development”. In addition, the application of ICT within higher learning institutions has a strategic place in enhancing their operational efficiency and advancement. However, the level of ICT application in the education sector is facing a number of bottlenecks due to the limitation of ICT infrastructure and specific competent workforce (TCU 2005). MSTHE with the assistance of development partners in Tanzania established the Tanzania Education Network (TENET) to enhance connectivity between institutions of higher learning among institutions of higher learning, ministries, and other stakeholders much more cost effectively (TCU 2005).

### **2.3 Academic libraries in Tanzania**

Marga (2005) defines a university as a ‘complex’ institution which carries out many tasks including educating specialists at various levels for multiple professions, producing research and researchers and “contributing to community service, cultural self-understanding, and intellectual enlightenment”. Marga (2005) further explains that these tasks were supported by various rules, regulations, procedures, and laws and that these ultimately led to the improvement of living conditions. Besides their roles of public services, universities were recognised as centres of teaching, learning, and research, which did not operate in isolation, but were affected by globalisation and various aspects emanating from it.

Altbach (2005) explains that many universities strived to achieve a ‘world class’ status or to be of good reputation in the field of higher education, by producing outstanding, peer-recognized, measurable, and communicable research. The Majority of universities in the developing world lacked adequate research facilities and infrastructure; therefore they could not fully achieve research status, and instead continued to be known as ‘teaching institutions’. At the time of this research, there were more than twenty-nine (29) universities in Tanzania both private and public of which 12 academic libraries are in public universities and 17 are private universities (TCU 2014). The following section provides the profile of academic libraries selected in this study.

### **2.4 The profile of the academic libraries selected in the study**

A total of eight academic libraries located in eight public universities in Tanzania (both mainland and Zanzibar) were selected in this study. These include:- Ardhi University (ARU), University of Dodoma

(UDOM), Muhimbili University of Health and Allied Sciences (MUHAS), Open University of Tanzania (OUT), University of Dar-es-Salaam (UDSM), Sokoine University of Agriculture (SUA), and Mzumbe University (MU) all from Tanzania mainland. The State University of Zanzibar (SUZA) is from Zanzibar.

Inclusive criteria for the universities selected have been indicated in Chapter One section 1.8. The generalisation of the findings benefits academic libraries that participated in the study. The study recommendations and models developed are applicable to other academic libraries in both private and public universities. The following sub-sections present descriptions of each academic library where this study was conducted.

#### **2.4.1 Ardhi University (ARU)**

ARU is a public university which is situated in Dar es Salaam, Tanzania. Ardhi University was established under University Act No 7 of 2005 and came into being after the signing of Ardhi University Charter by the then President of United Republic of Tanzania, Jakaya Kikwete on 28 March 2007 (IUCEA 2005). UDSM of which, it was a constituent college as from 1996-2007, at that time it was known as University College of Lands and Architectural Studies (UCLAS). Prior to being part of UDSM, ARU was known as Ardhi Institute with a history extending back to the mid-1950s (IUCEA 2005).

The university offers undergraduate and postgraduate degrees in the following schools: School of Architecture and Design (SADE), School of Construction Economics and Management (SCEM), School of Environmental Science and Technology (SEST), School of Urban and Regional Planning (SURP), School of Geospatial Sciences and Technology (SGST) and School of Real Estates Studies (SRES) (IUCEA 2005).

ARU Library serves the information needs of undergraduate and postgraduate students, lecturers, researchers, and practising professionals. ARU Library also caters to the information needs of researchers in the aspects of human settlements, which are carried out and coordinated by the Institute of Human Settlement Studies (IHSS) and programmes of continuing education coordinated by Centre for Continuing Education (CCE). The library also has computer facilities with internet connectivity for the library users' convenience, in a calm and relaxing environment, conducive to studying. Web 2.0 tools are not yet incorporated to foster library services such as scholarly communication and online communication, participation and sharing of information among users.

#### **2.4.2 Muhimbili University of Health and Allied Sciences (MUHAS)**

MUHAS is a public university in Dar es Salaam, and it is a successor to the Muhimbili University College of Health Sciences (MUCHS) which was a constituent college of the University of Dar es Salaam. MUCHS was established by an Act of Parliament, Act No. 9 of 1991 when the then Faculty of Medicine was upgraded to a college. The Faculty of Medicine originated from the Dar es Salaam School of Medicine which was established in 1963 by the Ministry of Health with the primary aim of training clinical health staff. In 1968, the Dar es Salaam School of Medicine was upgraded to a Faculty of Medicine of the Dar es Salaam University College of the University of East Africa. In 1976 the Faculty of Medicine was incorporated into Muhimbili Hospital to form the Muhimbili Medical Centre (MMC).

In 1991, the Faculty of Medicine was upgraded to a constituent college of the University of Dar es Salaam, with the aim of nurturing it to a full-fledged university. In 2000 the Government by an Act of Parliament disestablished MMC and created two closely linked, but autonomous public institutions: MUCHS and the Muhimbili National Hospital (MNH) (MUHAS 2007). Over the years MUCHS made significant achievements through increased student enrollment and development of several new academic programmes. The Parliament Act No. 9 of 1991 that established MUCHS was repealed in 2005 (MUHAS 2007). MUHAS was established in 2007 by Article 1 of the Charter of Incorporation, in line with the recommendations of the Tanzania Commission of Universities (TCU).

MUHAS has a range of programmes in basic, clinical and allied health sciences for both postgraduate and undergraduate students. These programmes are taught in the five Schools and one academic Institute of the University (MUHAS 2007). The university can be accessed via the Internet at <http://www.muhas.ac.tz>

The MUHAS Library serves the entire university. The library comprises several computers connected to the Internet to support users in online searching and the retrieving of online information needs. Furthermore, the library has Wi-Fi to offer wireless connectivity to its users. The core activities of the library include: collection development and maintenance, provision of access to organized materials and reader services: including loans, reference and advisory services, provision of information search, retrieval and dissemination through catalogues, bibliographic tools internet and databases and provide and conduct from time to time user education and survey (research). The library has also developed and it has been maintaining a database of Tanzania medical/health information (local content) including submission of data to various health/medical databases including the *African Index Medicus* database. Additionally,

the library uses a number of Web 2.0 tools comprising of Blogs, Facebook, Twitter and Wikis to foster, promote and announce library services including communicating with its users (MUHAS 2007).

### **2.4.3 Mzumbe University (MU)**

MU was established in 2001 by the Mzumbe University Charter under Section 25 of the Universities Act No. 7 of 2005 (MU 2006). MU is among the oldest universities in Africa whose history can be traced to 1953. This was made under the Act of Parliament No.21 of 2001 (MU 2009). Furthermore, the mandate of the university as stipulated in the Mzumbe University Charter, 2007 focuses on training, research, publications and public service cum consultancy (MU 2009). MU can be accessed via the Internet at <http://www.mzumbe.ac.tz>

The academic library is under the Mzumbe University Directorate of Library and Technical Services (MU 2009). MU Library provides and promotes access to information resources and services for the achievement of the University's objectives in teaching, learning, research, and creativity. MU offers a number of electronic resources through its website.

### **2.4.4 Open University of Tanzania (OUT)**

OUT is the first university in the whole of the East Africa region to offer educational programmes through open and distance learning mode (TCU 2005). This makes OUT peculiar from conventional residential universities. Through Open and Distance Learning (ODL), OUT allows flexible learning environment leading to protracted periods of course completion (OUT 2005). Being an ODL institution OUT operates through a network of 30 Regional Centres and more than 70 Study Centres in Tanzania and abroad. It addresses the emerging national, regional and global challenges which emanate from the fast changing perceptions and world cultural, social and economic outlooks.

OUT Library offers state of the art technology, a vast collection of research and reading materials and the specialised services (TCU 2005). In keeping with the central role in support of the core mission of the university, namely teaching, learning, research and community services in the distance education delivery mode, the main library lies at the heart of the OUT Head Quarters, while mini libraries are set in locations convenient to the staff and students in the Regional Centres (OUT 2005). OUT Library houses more than 200,000 printed volumes, while their virtual presence consists of bibliographic and full-text databases, electronic books, open courseware, electronic journals and growing institutional digital repository (OUT 2005).

OUT Library has a website which provides essential information about the library hours and services and acts as a gateway to a wealth of research and learning materials such as electronic journals, open courseware, electronic books and online thesis/ dissertation (OUT 2005). In addition, the library makes available an online catalogue of books available in the main library and in the regional centres. The university can be accessed via the Internet at <http://www.out.ac.tz/>

#### **2.4.5 Sokoine University of Agriculture (SUA)**

SUA is a public university in Morogoro, Tanzania specialising in agriculture. It is the only agricultural university and the second largest university in Tanzania after UDSM (SUA 2008). SUA was established on the 1<sup>st</sup> of July, 1984 by the Parliamentary Act No. 6 of the same year. SUA is currently made up of four campuses and one constituent college. The campuses are the Main Campus and Solomon Mahlangu Campus in Morogoro, the Olmotonyi Campus in Arusha, and the Mazumbai Campus in Lushoto.

The constituent college, known as Moshi University College of Cooperative and Business Studies (MUCCoBS) is located in Moshi municipality (SUA 2008). However, by the year 2015, this constituent was transformed into a fully fledged university known as Moshi Co-operative University (MoCU). SUA has four mandates: training, research, consultancy and outreach. SUA offers training that leads to awarding of certificates, diplomas, bachelors, masters, and doctorates. Non-degree programmes offered by SUA include Diploma in Information and Library Science, Diploma in Records, Archives and Information Management, Diploma in Animal Health and Production, Diploma in Laboratory Technology (SUA 2008). SUA can be accessed via the Internet at <http://www.suanet.ac.tz>

SUA hosts the National Agricultural Library (SNAL) which is the University's Library. SNAL provides information resources in print and electronic format. Furthermore, it has a computer centre which provides a wide range of information and communication technology (ICT) services and state-of-the-art networking environment to support teaching, learning, research and administrative activities of all students and staff of the university. SNAL offers online services including provision of access to Online Public Access Catalogue (OPAC) which provides the access to a wide range of information in agriculture and related disciplines (SUA 2008). Furthermore, SNAL offers Web 2.0 tools which are Facebook and Twitter to foster online communication, participation, and sharing among library users.

#### **2.4.6 The State University of Zanzibar (SUZA)**

SUZA is a public university located in Zanzibar Island. SUZA was established by an act of House of Representatives of Zanzibar in 1999 and became fully operational in 2002. Currently, SUZA consists of

the Institute of Kiswahili and Foreign Languages (IKFL), Institute of Continuing Education (ICE), the School of Education, Arts and Sciences (SEAS) and Computer Centre (CC). There is also another campus of SUZA located in another sister Island of Pemba. More institutes and schools will be established in the future as demanded by the Act and as the University grows (TCU 2005). The university is connected to the Internet at <http://www.suza.ac.tz>.

Currently, SUZA Library consists of the main library and two branch libraries. The two branch libraries are the Reference library and the Nkrumah library. The main library and the reference library are located at the Vuga Campus while the Nkrumah library is located at Beitelras Nkrumah Campus (TCU 2005). SUZA Library is connected to the Internet and it offers several electronic resources to satisfy the users' needs through an online presence.

#### **2.4.7 University of Dar-es-Salaam (UDSM)**

UDSM is a public university situated in Dar es Salaam and is the oldest and biggest university in Tanzania. It was established on 1 July 1970, through parliament Act No. 12 of 1970 and all the enabling legal instruments of the constituent colleges (UDSM 2007). Prior to 1970, the University College of Dar es Salaam had started on 1 July 1961 as an affiliate college of the University of London. It had only one faculty which was the faculty of Law comprised of 13 students. The university became an affiliate of the University of East Africa (UEA) in 1963, shortly after Tanzania gained its independence from the United Kingdom. In 1970, UEA split into three independent universities: Makerere University in Uganda, the University of Nairobi in Kenya, and UDSM in Tanzania (UDSM 2007).

UDSM is a unique community of students and staff dedicated to bringing out the best in all its members. Its main aim is to provide the best possible environment for teaching, learning research and public services, and their track record of success is well known in East Africa, Africa in general, and the rest of the world. UDSM is also at the centre of national and international higher education innovations and initiatives. UDSM- ICT Services are provided, maintained and supported by University of Dar es Salaam Computing Centre (UCC) via UDSM ICT Services Department which works in collaboration with systems Administrators in UDSM various Schools, Colleges, and Departments (UDSM 2007). The university can be accessed via the Internet at <http://www.udsm.ac.tz>.

UDSM Academic Library was established in 1961 and since that time it has strived to facilitate effective teaching, learning, research and knowledge exchange through the provision of qualitative, flexible, diverse and user-centered information services and resources. The library is endowed with highly

qualified academic professionals who work hard to satisfy library's users' needs. The library is offering several electronic services to satisfy the users' needs online (UDSM 2007).

#### **2.4.8 The University of Dodoma (UDOM)**

UDOM is a public university in central Tanzania located in Dodoma, the country's capital. As the time of this research, part of UDOM's expansion construction was taking place on a 6,000 hectare site in the Chimwaga area about 8 kilometres (5.0 m) East of downtown Dodoma (UDOM 2009). UDOM was formally established in March 2007 following the signing of the Charter by then the President of the United Republic of Tanzania. The first academic programmes commenced in September 2007 (UDOM 2007). The university is connected to the Internet so it can be accessible at <http://www.udom.ac.tz> (UDOM 2009).

The UDOM Library has established in parallel with the UDOM in February 2007 with over 1200 users and 14 library staff. The mission of the UDOM Library is to support and enhance academic, research and consultancy activities through the provision of the most relevant information resources and services. Currently, UDOM Library is using the Intranet to offer some of the online services among library users. However, there are several ports to support Internet services (UDOM 2009).

#### **2.5 Tanzania Information and Communication Technology (ICT) infrastructure: an overview**

The application of ICT in Tanzania was mainly limited to radio and landline telephones. New ICT started in the mid-1990s (Mwakaje 2010). There are currently a number of ICT development initiatives in Tanzania that are funded by the government, donor countries and the private sector to enhance ICT application and usage. Tanzania is in the process of becoming a hub of ICT infrastructure and solutions that will foster various activities to keep pace in this age of science and technology; despite the high cost of internet services (Wachira 2012). Tanzania is expecting that the ICT landscape will change dramatically with the recent landing of submarine cables on the East African Coast and the fibre optic cables.

Tanzania is among sub-Saharan African countries which are employing ICT to foster its national development plans through its impact in social and economic sectors such as education, agriculture, and health (Henley 2012). Tanzania has very limited ICT production capacity; thus, it entirely depends on imported hardware. The country also has small local software industries and a relatively low but increasing range of local content, there is also a growing group of bloggers and others producing user-generated content (Henley 2012).



Tanzania adopted a National policy in 2003 to enhance the ICT application and implementation within different sectors (Henley 2012). Tanzania made many efforts of introducing ICT under its ministry of communication, science, and technology through the Tanzania Commissions Regulatory Authority (TCRA) in 2003 (Yonazi 2012); to make sure that citizens get technologies which could help them to keep pace in this age of science and technology. In 2007, Tanzania became only the second country in Africa to obtain a High-Speed Downlink Packet Access (HSDPA), Mobile Broadband network, from Vodacom which is the country's largest mobile provider (Materu-Behitsa and Diyamett 2010; Yonazi 2012).

Tanzania employed the National ICT Broadband Backbone (NICTBB) which addresses national needs and those of the landlocked neighbouring countries by offering both cross-border connectivity and access to four International submarine cables: SEACOM, EASSY, SEAs and TEAMS (at Mombasa, Kenya) (Yonazi 2012). Tanzania is constructing NICTBB by utilising optical fibre technology that connects all its regions and districts, giving them access to the 10,000 km length national and regional broadband infrastructure, as well as to the international submarines fibre optic cables (EASSY and SEACOM) for global connectivity. The implementation of the NICTBB is a part of Tanzania's National ICT Policy (URT 2005) developed in 2003 and then acknowledged by the Government of Tanzania in the National Development Vision 2025, for its importance in enabling ICTs to accelerate achievement of the goals and objectives of the National Development Vision 2025 (Pazi and Chatwin 2014:823).

There are two wired broadband which arrived in Tanzania in 2009 and 2010, respectively. These are the high-speed fiber optic broadband arrived in July 2009 after the Internet provider SEACOM completed linking its two cable system through south and east Africa to global networks via India and Europe; and the optic fiber cable which was opened In July 2010 by the Eastern Africa Submarine Cable System (EASSY) (Yonazi 2012).

The country has also employed wireless broadband; the Worldwide Interoperability for Microwave Access (WiMAX) which is one of the modern and robust wireless technologies worldwide (Sedoyeka, Hunaiti and Tairo 2010). WiMAX is a modern wireless technology created to offer a high level of mobility, security, quality of service (QoS), wide coverage, interoperability and portability and it is easy to deploy, with the flexible architecture, while providing high capacity networks with low-cost (Mlozi, Jing and Sedoyeka 2010).

Tanzania has two fixed-line operators which are Tanzania Telecommunications Company Limited (TTCL) and Zantel) and five leading mobile network operators which are Vodacom, Tigo, Airtel

(formerly Zain), Zantel and Halotel. There are two operators which were licensed to provide Basic telecommunication services, viz, Tanzania Telecommunications Company Limited (TTCL) the incumbent national operator and Zanzibar Telecom Limited (ZANTEL) (Materu-Behitsa and Diyamett 2010:13). Higher learning institutions in Tanzania have been employing ICT to enhance and to improve the quality of education (Nkembo, Koloseni and Shimba 2011).

## **2.6 Chapter Summary**

Chapter Two has discussed the context of the study. It has also provided an overview of Tanzania and the history of higher learning institutions and academic libraries in the country. It also provides the profile of each academic library involved in the study. Lastly, it provides an overview of ICT infrastructure in Tanzania.

## CHAPTER THREE

### LITERATURE REVIEW AND THE THEORETICAL FRAMEWORK OF THE STUDY

#### 3.0 Introduction

This chapter provides the theoretical foundation for the study as well as a review of the literature. The literature review explores the dominant theme of this study which is the application of Web 2.0 tools to enhance KM practices. As a way of introduction, the significance of a literature review in research is included in this chapter. Furthermore, the theoretical framework that guided this study is presented in this chapter as well. Additionally, the scope of this literature review is guided by the research objectives indicated in this study to justify the gap present for each corresponding objective.

#### 3.1 The significance of a literature review

Blaxter, Hughes, and Tight (2010) define literature review as “a critical summary of the range of existing materials dealing with knowledge and understanding in a given field....its purpose is to locate the research project, to form our context or background, and to provide insights into previous work”. The literature review summarises and synthesises various ideas which other researchers have already put forward (Kaniki 2006). Sage Dictionary of Social Research Methods (2006) provides the purposes of conducting a literature review which include:-

- (a) Clarify and conceptualise the research question, pointing out gaps in the existing literature;
- (b) Improve the methodology, done by observing how other investigators have studied the same topic; and
- (c) Widen the researcher’s knowledge in the chosen area.

Leedy and Ormrod (2001:64) assert that “The review of literature allows one ‘to look again’ (review) at what others have done in areas that are similar, though not necessarily identical to, one’s own area of investigation”. In addition, Leedy and Ormrod (2010:51) provide the following benefits of conducting a literature review:-

- (a) To ascertain whether other researchers have already addressed and answered the proposed research problem;
- (b) To offer new ideas, perspectives, and approaches that may not have occurred to a researcher;
- (c) To inform about other individuals who conduct work in the same research area;

- (d) To show how other researchers have handled methodological and design issues in similar studies;
- (e) To reveal sources of data that a researcher may not have known that they are available;
- (f) To introduce and provide measurement tools that other researchers have developed and used effectively; and
- (g) To reveal methods of dealing with difficulties similar to those faced in undertaking similar research.

There are various types of literature reviews which give a particular reading a body of literature (Kaniki 2006). Cooper (1994), as cited in (Creswell 2003:32), propose that literature reviews can be described as integrative which focuses on theories that relate to the problem of the study. Another type of literature review is a methodological review (Creswell 2003:32). Similar to Cooper's (1994), Kaniki (2006) introduces four types of literature review which include historical review which considers chronological development of the literature; thematic reviews which is structured around different themes and focus on debates between different schools; theoretical review which traces theoretical developments in a particular area and how each theory is supported by empirical evidence; and empirical review which summarises the empirical findings. The review of literature in this study included theoretical review which traces various theoretical developments supported by an empirical evidence in a particular area, empirical review which provide the summary of an empirical findings, and conceptual review (Kaniki 2006).

### **3.2 The theoretical foundations of the study**

The theoretical foundations of a discipline are the basis on which research and development of the discipline are focused on generating ideas (Kombo and Tromp 2006). Neuman (2006) explains that researchers need to consult various theories to understand the problem of the study. The theory is a set of interrelated constructs (concepts, definitions, and propositions) that present a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting the phenomenon (Borbias, Jackson, and Langford 2004). Theories give researchers different perspectives through which to look at complex aspects and social issues, focusing their attention on different aspects of the data and providing a framework to conduct their analysis (Sveiby 2001). Mitchell and Jolley (2007) explain the benefits of using theory as opposed to the use of common sense in doing research. These include, but are limited to:-

- (a) Theory tends to be more consistent than common sense;
- (b) Usually, theory does not contradict itself...;

- (c) Theory tends to be more consistent with existing facts than common facts;
- (d) Theory is not restricted to making common sense or intuitively obvious predictions;
- (e) Theory summarises and organises a great deal of information;
- (f) Theory focuses research;
- (g) Theory is broad in scope;
- (h) Theory can be applied to a wide range of situations;
- (i) Researchers can generate a wide variety of studies from a single theory; and
- (j) The theory explains facts with only a few core ideas.

There are various KM and Web 2.0 models to support the application of Web 2.0 tools to enhance KM practices. This study employed four KM and Web 2.0 models to have a clear picture of the study problem. This is due to the fact that focusing on a single model may limit organisations to a range of possible solutions to the study problem. Each model has its characteristics and limitations. Further, selecting a suitable model needs an understanding of available models which explains the research problem in detail (Probst, Raub, and Romhardt 2000). Thus, the theoretical foundation of this study includes the following basic research models as described in the following sub-sections:-

### **3.2.1 Academic Library 2.0 Concept Model**

Academic Library 2.0 Concept Model is a model which was developed by Habib in 2006 (Habib 2006). Habib (2006) developed a detailed model known as Academic Library 2.0 concept model that includes interaction types as well as places. Academic Library 2.0 Concept Model explains how academic library can be considered as a place where both traditional and online services could take place at the same time. Habib (2006) explains that Academic Library 2.0 Concept Model is based on the idea that student life is divided into two parts which are the social and the academic. Therefore an academic library is a place which can provide both online and traditional services.

The goal of the Academic Library 2.0 Concept Model is to facilitate thoughts about how to design virtual and physical spaces according to the types of interpersonal interactions among library users and librarians. The model encourages constant and purposeful change by inviting user participation in the creation of both physical and virtual services they want which is supported by consistently evaluating services (Mahmood and Richardson 2011:366). Therefore, Academic Library 2.0 Concept Model was used in this study to assist in the access and use of various Web 2.0 tools so as to facilitate KM practices, particularly knowledge creation and sharing, in academic libraries. Figure 3.2:1 shows Academic Library 2.0 model and its functionalities in academic libraries.

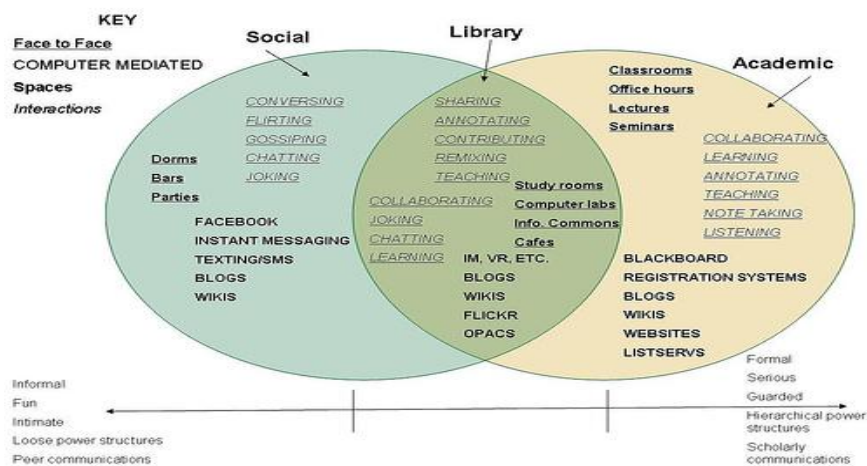


Figure 3.2:1 Academic Library 2.0 concept model

### 3.2.2 Knowledge Management Systems (KMS) success model

IT is regarded as the main enabler for the application of KM practices. Wu and Wang (2006:728) explain that IT has advanced dramatically in both capability and affordability, and it is recognised for its ability to capture, store, process, retrieve and communicate. Therefore, based on the development of IT, various systems were created to support different activities. IS was among the systems established as a result of the development of IT.

The majority of the academic institutions have been specifically developing ISs that are designed to support the flow and use of information. Among the IS success models which are well known and used in the majority of academic institutions are the one which was developed by DeLone and McLean in 1992, and then updated in 2002 (DeLone and McLean 2004). On the other hand, the IS success models which were developed to support KM practices are known as KMS (Alavi and Leidner 2001).

KMS refers to a class of IS applied to manage organisational knowledge (Alavi and Leidner 2001; Jennex and Olfman 2003; 2008; Jennex 2011). Alavi and Leidner (2001:114) assert that KMS is an IT based system developed to support and enhance the organisational processes of knowledge creation, storage/retrieval, transfer, and application. In this study, Web 2.0 tools were regarded as KMS.

Literature provides three common applications of KMS which are coding and sharing of best practices, the creation of corporate knowledge directories, and the creation of knowledge works (KPCB 2015;

O'Dell and Jackson 1998; Jennex and Olfman 2003;2008; Wu and Wang 2006). Further, Ruggles (1997) provides the following common application of KMS:-

- (a) Creation of corporate directories used in the mapping of internal expertise. This is because much of organisational knowledge remains uncodified; thus, mapping of the internal expertise is the potential useful application of KM practices; and
- (b) Creation of knowledge networks which is used to bring people together virtually and by face-to-face to exchange and build their collective knowledge in each of the speciality areas.

Gray (2000) explains that despite the scarcity of models and frameworks developed from empirical surveys that attempted to evaluate KMS success, there are few KMS models which could be adapted to guide KM studies. Examples of such models are: the Delone and McLean IS Success Model (Delone and McLean 2004), and the Jennex and Olfman KMS Success Model (Jennex and Olfman 2003). This study adapted Jennex and Olfman KMS Success Model (Jennex and Olfman 2003). Jennex and Olfman (2003) have created a KMS Success Model based on the Delone and Mclean IS Success Model functionalities (Delone and McLean 2004). Jennex and Olfman KMS Success Model (Jennex and Olfman 2003) includes the following descriptions:-

- (a) System quality to define how well the KMS performs the functions of knowledge creation, storage/retrieval, transfer, and application, and how the KMS is supported by the IS staff and infrastructure;
- (b) Knowledge quality to ensure that the right knowledge with sufficient context is captured and available for the right users at the right time;
- (c) Use/user satisfaction indicates the actual levels of KMS use as well as the satisfaction of the KMS users. User satisfaction is a construct that measures satisfaction with KMS by users. It is considered a good complementary measure of KMS use when use of the KMS is required, and effectiveness of use depends on users being satisfied with the KMS;
- (d) Perceived benefit/intention to use is used to measure perceptions of the benefits and impacts of the KMS by users and is based on the Perceived Benefit Model (Thompson, Higgins, and Howell 1991). It is a good for predicting continued KMS use when use of the KMS use depends on meeting current and future user needs (Thompson, Higgins, and Howell 1991); and
- (e) Net impact is an individual's use of a KMS and will produce an impact on that person's performance in the workplace (Jennex and Olfman 2003). Each individual impact will, in turn, have an effect on the performance of the whole organisation.

However, Jennex and Olfman KMS Success Model based on Delone and Mclean IS Success Model, it lacks service quality and intention to use constructs (Delone and Mclean 2004). Figure 3.2:2 depicts Jennex and Olfman KMS Success Model.

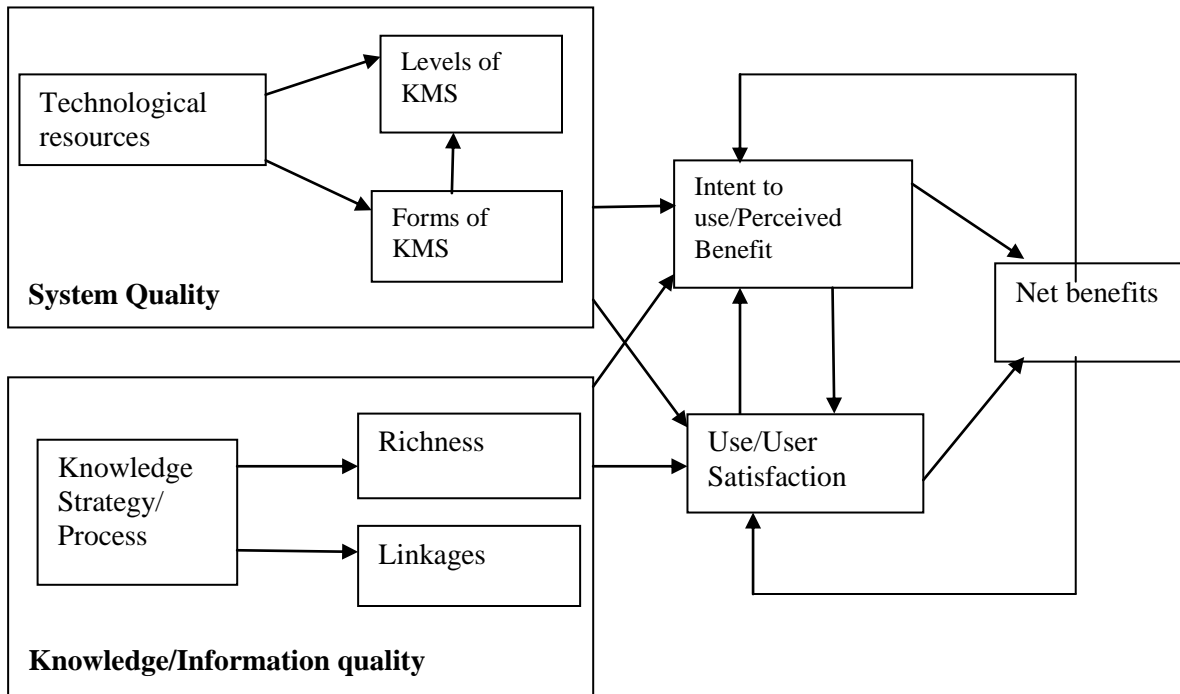


Figure 3.2:2 Jennex and Olfman KMS Success Model

### 3.2.3 Knowledge Creation /SECI Model

Knowledge Creation Theory was developed by Nonaka (Nonaka 1994). It is also known as Nonaka theory of knowledge creation (Nonaka 1994). Hislop (2013:109) asserts that knowledge constitutes what an individual believes is true. Knowledge is based on people’s experiences and interactions with others, especially those understanding the same events. Generally, there are four models of knowledge conversion (Nonaka 1994).

The idea of “knowledge conversion” evolves from Anderson’s ACT model (Anderson 1993) which was developed in cognitive psychology. However, the ACT model involves the transformation of knowledge is unidirectional and only involves transformations from declarative to procedural knowledge, while it can be argued that transformation is bidirectional. This may be because the ACT model is more concerned with maturation than with the creation of the knowledge (Nonaka 1994). The assumptions that knowledge is created through conversion between tacit and explicit knowledge allows the postulation of four



different “models” of knowledge conversion from tacit knowledge to tacit knowledge (socialisation), from explicit knowledge to explicit knowledge (externalisation), from tacit knowledge to explicit knowledge (combination) and from explicit knowledge to tacit knowledge (internalisation).

The knowledge creation process has been described based on the SECI processes that involve both tacit and explicit knowledge (Nonaka et al. 1994). There are two types of knowledge creation which are: organisational knowledge creation and individual knowledge creation. Nonaka et al. (1994) explain that organisational knowledge creation as distinct from individual knowledge creation takes place when all four models of knowledge creation (SECI processes) are organizationally managed to form a continual cycle. In addition, the organisational knowledge creation involves developing new contents or replacing existing contents within the organisation’s tacit and explicit knowledge through SECI processes which are not pure but are highly interdependent and intertwined (Alavi and Leidner 2001).

Knowledge sharing, on the other hand, is the process through which explicit or tacit knowledge is communicated to others (between individuals, to groups, and across groups). In this backdrop, Becerra-Fernandez and Sabherwal (2001) explain that SECI processes of Nonaka et al. (1994) also describe ways in which knowledge is shared through the interaction between tacit and explicit knowledge. The SECI processes are considered as the model of knowledge creation (discovery and capture) (Becerra-Fernandez, Gonzalez, and Sabherwal 2004) and knowledge sharing (Becerra-Fernande, Gonzalez, and Sabherwal 2004; Jennex and Zyngier 2007). Therefore, the following sub-sections explain how knowledge creation and sharing are executed under the utilisation of SECI processes.

### **3.2.3.1 Socialisation (conversion of tacit knowledge to new tacit knowledge)**

Socialisation refers to the conversion of tacit knowledge to a new tacit knowledge through social interactions and shared experiences among organisational members (e.g. apprenticeship) (Nonaka et al. 1994). Nonaka (1994) defines knowledge as “justified true belief” which refers to the knowledge developed by individuals based on experiences and work practices. Therefore socialisation describes an environment where individuals or groups can share personal experiences, mental models, beliefs, perspectives and tacit knowledge through individual direct interaction (Nold 2009).

Nonaka and Konno (1998:42) assert that socialisation involves the sharing of tacit knowledge between individuals through joint activities such as being together, learning and teaching together, travelling together, spending time and living in the same environment. Socialisation also deals with inter-personal

sharing whereby new tacit knowledge can be gained from accessing the tacit knowledge of others as they work together on daily basis (Hislop 2013:109). Therefore, within an organisation, tacit knowledge from experienced and senior employees can be shared with less experienced employees for the benefit of the entire organisation.

### **3.2.3.2 Externalisation (conversion of tacit knowledge to new explicit knowledge)**

Externalisation is the conversion of tacit to explicit knowledge which involves articulation of one's own tacit knowledge (Hislop 2013; Nonaka 1994). Nonaka and Takeuchi (1995:64) explain that "through externalisation, tacit knowledge becomes explicit knowledge, taking the shape of metaphors, analogies, concepts, hypotheses or models". Nold (2009) adds that externalisation describes a process whereby tacit knowledge is converted into a form that is capable of being transmitted to others outside of the immediate group, through the creation of procedures, e-mails, and any other forms of media that transmit knowledge to a wider sphere. In addition, externalisation involves the movement of knowledge from the level of individual to a group whereby individuals articulate, communicate and justify their individual knowledge to a group of peers (Hislop 2013:110).

Speaking to an individual, writing, dialogue, drawing a diagram, and giving a presentation or even conducting a lecture, make a few examples of externalising process. Externalisation ensures that tacit knowledge is transferred and codified into explicit knowledge to be easily shared. Within the academic libraries' context, library staff can be encouraged to store their knowledge to be retained for the future use of the institution. Generally, externalisation is supported by two factors which include the conversion of tacit into explicit knowledge and translating the tacit knowledge of customers or experts into readily understandable forms (Nonaka and Konno 1998:44).

### **3.2.3.3 Combination (Creation of new explicit knowledge)**

The combination is the conversion of explicit to explicit knowledge in which explicit knowledge can be obtained from inside and outside an organisation and then combined, edited and processed to form new explicit knowledge (Gottschalk 2003). Nonaka et al. (1994) explain that combination involves the creation of new explicit knowledge by merging, categorising, reclassifying and synthesising explicit knowledge, for example, literature survey reports.

Nonaka and Takeuchi (1995:67) state that "combination is a process of systematising concepts into a knowledge system". Combination involves the creation of new forms of explicit knowledge from the existing forms of explicit knowledge. Therefore, the movement of knowledge from group level to

organisation level (Hislop 2013). Within academic libraries, the stored knowledge can be reused by communicating and sharing and then produce new explicit knowledge. Different bodies of explicit knowledge are combined. Nonaka and Konno (1998:45) mention three processes of the combination phase as follows:-

- (a) Capturing and integrating new explicit knowledge;
- (b) Disseminating explicit knowledge; and
- (c) Editing or processing of explicit knowledge to make it more usable.

#### **3.2.3.4 Internalisation (Creation of new tacit knowledge from explicit knowledge)**

Internalisation involves the creation of new tacit knowledge from explicit knowledge, for example through learning and understanding the results from readings and discussions (Nonaka et al. 1994). Individuals or groups process newly received knowledge with their own tacit knowledge and by merging knowledge from internal and external sources to create an entirely new knowledge which seems more useful to an organisation (Nold 2009; Nonaka and Konno 1998).

Hislop (2013:101) adds that internalisation involves the conversion from explicit to tacit form whereby, knowledge moves from the organisation to the individual level through the process of absorption or embodiment. This is when members learn new knowledge and internalise it for their activities and when internalisation occurs, the new knowledge becomes part of existing mental model and knows how (Gottschalk 2003). Therefore, internalisation is in two dimensions which are the explicit knowledge that has to be embodied in action and practice and embodying the explicit knowledge by using formula or experiments to trigger learning by doing processes (Nonaka and Konno 1998:45). The Figure 3.3:3 presents the SECI processes.

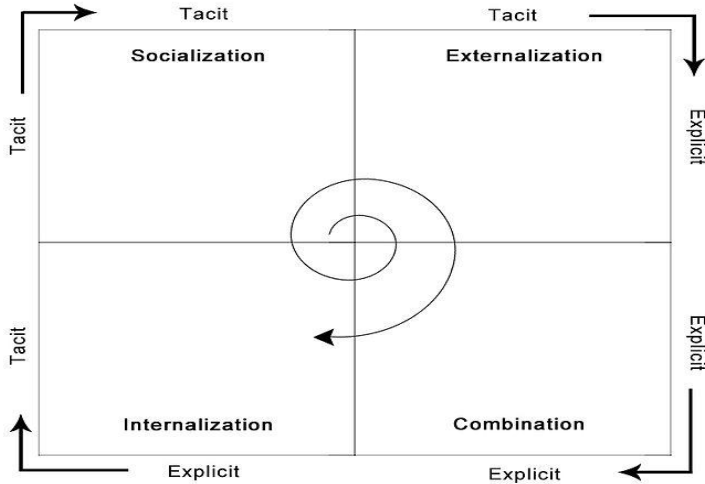


Figure 3.2:3 SECI processes

Knowledge creation and sharing evolve through a spiral rather than circular motion. This is because SECI knowledge creation/conversion process involves a double simultaneous conversion in which each mode of knowledge creation, not only is knowledge created via changing forms but simultaneously knowledge moves from an individual, group and organisational levels (Hislop 2013:109). Table 3.2:1 depicts Nonaka’s four modes of knowledge conversion.

Table 3.2:1 Nonaka’s four modes of knowledge conversion

Attribute	Socialisation	Externalisation	Combination	Internalisation
Knowledge conversion type	Tacit to tacit	Tacit to explicit	Explicit to explicit	Explicit to tacit
Change in level of knowledge	Individual to individual (between people)	Individual to group	Group to organisation	Organisation to individual
Illustrative example	Where a member of a workgroup acquires the tacit knowledge possessed by other by other group members through dialogue, observation or cooperative working	Where an individual is able to make their tacit knowledge explicit, e.g. through process of communication and dialogue with others	The linking together of discrete bodies of knowledge to create a more complex body of knowledge	Where an individual converts explicit knowledge into tacit knowledge through applying it to their work tasks

Source: Hislop (2013)

The four knowledge creation modes are not pure, however, they are highly interdependent and intertwined (Nonaka et al. 1994:116). Alavi and Leidner (2001:116) add that each knowledge creation mode contributes to and benefits from other modes. For example, socialisation mode can result in the creation of new knowledge when an individual obtains a new insight trigger by interaction with another. On the other hand, socialisation mode involves transferring of existing tacit knowledge from one member to another through discussion of ideas (Hislop 2013).

New organisational knowledge per se may not be created, but only knowledge that is new to the recipient (Hislop 2013). The combination mode in most cases involves an intermediate step that is, an individual drawing insight from explicit sources (i.e. internalisation) and then coding the new knowledge into explicit form (externalisation). Finally, internalisation may consist of the simple conversion of existing explicit knowledge to an individual's tacit knowledge as well as the creation of new organisational knowledge when the explicit sources trigger a new insight (Nonaka et al. 1994; Hislop 2013).

Knowledge creation can also be viewed as a bottom-up spiral process, starting with the sharing of tacit knowledge at the individual level and moving to crystallisation of the knowledge at the group level and then on to the organisational level (Nonaka, Von Krogh, and Voelpel 2006). Nonaka and Takeuchi (1995) argue that experiences through socialisation, externalisation and combination become valuable assets when they are internalised into individuals "tacit knowledge" basis in the form of shared mental models or technical know-how. Web 2.0 tools help individuals internalise their experiences. Thus, enriching their tacit knowledge (Hislop 2013).

In principle, Web 2.0 tools could be used to facilitate the sharing of explicit knowledge to other people, thus helping them enjoy the experiences of others indirectly (Hislop 2013). Knowledge creation and sharing occur when people exchange tacit and explicit knowledge (Hislop 2013). The four modes of Nonaka and Takeuchi's (1995) SECI Model show that knowledge can be created and shared among employees (library staff) and stored for the future use of the organisation. Through social and collaborative processes as well as individual's cognitive processes (e.g. reflection), knowledge is created, shared, amplified, enlarged and justified in the organisational set-up (Nonaka 1994).

#### **3.2.4 Web 2.0 Driven SECI Model**

A Web 2.0 Driven SECI Model is based on the ideas developed by Chatti et al. (2007) adapted from the learning model. The model explains how Web 2.0 technologies could be integrated into KM practices

(knowledge creation and knowledge sharing practices). In other words, the model explains how SECI processes could be combined with various Web 2.0 tools to facilitate knowledge creation and sharing practices in academic libraries. Nonaka and Takeuchi (1995) explain that knowledge is created and expanded through social interaction between tacit and explicit knowledge. Therefore, the Web 2.0 Driven SECI Model also employed four spirals of knowledge conversion to explain the creation and sharing of knowledge. The following sub-section explains the creation and sharing knowledge through Web 2.0 Driven SECI Model.

#### **3.2.4.1 Socialisation process**

Socialisation is the process of sharing tacit knowledge. Socialisation occurs when individuals or groups share knowledge, experience, competencies and skills through observation, imitation and participation through the application of various Web 2.0 tools such as Facebook, Twitter, Blogs and RSS Feeds. Therefore, Web 2.0 tools such as Blogs, Twitter, RSS and Mashups combine and remix knowledge so as to form new knowledge, and then enhance the sharing of such knowledge through other Web 2.0 tools such as Wikis and Facebook (Shang et al. 2011:179).

#### **3.2.4.2 Externalisation process**

Externalisation is the process of articulating tacit knowledge into explicit concepts (Hislop 2013). Externalisation is the mode which holds the key to knowledge creation because it creates new explicit from tacit knowledge. With the application of Web 2.0 tools, the development of explicit concepts from tacit knowledge occurs through several modes of representation, including spoken or written words, images, video, and music (Shang et al. 2011:179).

Web 2.0 tools such as tagging and instant messaging can be used to support externalisation activities such as dialogues and discussions that capture context-rich knowledge when it is being created (Shang et al. 2011:179). The externalisation process involves the creation of alerts to users on the arrival of new materials through Current Awareness Services (CAS) established in various libraries, thus makes them visit the library to see and use such new materials. The use of Web 2.0 tools such as RSS Feeds, Blogs, and Facebook makes CAS easy as library users are easily informed on new arrivals. The increasing availability of publisher and vendor supplied RSS feeds provides another option for CAS (Chatti et al. 2007; Shang et al. 2011).

### 3.2.4.3 Combination process

The combination is the process of integrating different bodies of explicit knowledge. Within the combination process, the use of Web 2.0 tools such as Blogs and Wikis could be integrated to allow quick and wide information dissemination across institutions. In addition, RSS Feeds could be incorporated to enable information/knowledge sharing across networks; managing collaboratively tagging through Folksonomies and social bookmarking for adding, edit and share bookmarks (Shang et al. 2011:179). In addition, users can participate in activities that were once the sole purview of the library such as cataloguing via Folksonomy or providing comments on books via blogging (Kim and Abbas 2010:211).

### 3.2.4.4 Internalisation process

Internalisation is the process of embodying explicit knowledge into tacit knowledge and this can be facilitated by the application of Web 2.0 tools for simulation and sharing of best practices; sharing feedback through interaction between people and learning by doing through content editor and co-development (Shang et al. 2011:179). Shang et al. (2011:178) explain that “Although people can go through the whole learning process of SECI, various Web 2.0 services have been developed to support different stages of this process.” Further, the application of these tools increases openness and trust both online and in a physical library (Habib 2006). Figure 3.2:4 depicts Web 2.0 Driven SECI Model.

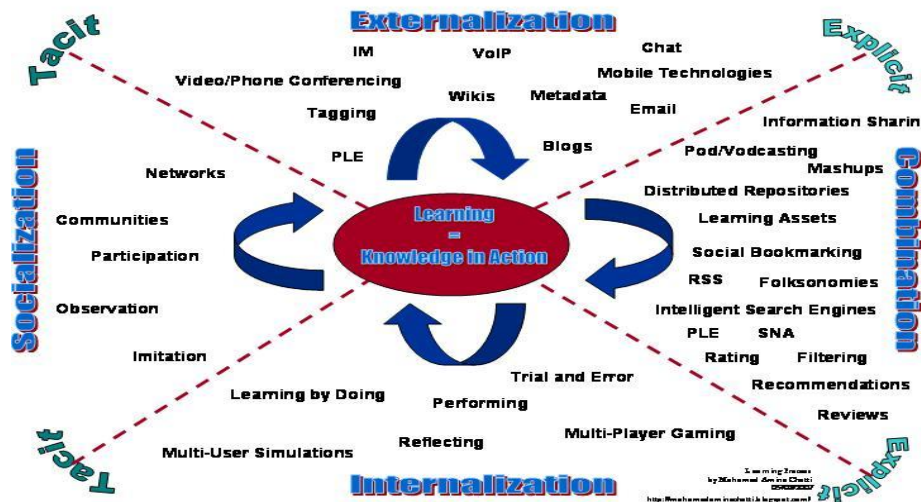


Figure 3.2:4 Web 2.0 driven SECI Model

### **3.2.5 The link between the theories/models and the research problem of the study**

The theories of this study lie within the following four models:-

- (a) Academic Library 2.0 Model,
- (b) Jennex and Olfman KMS Success Model,
- (c) Knowledge Creation Model (SECI processes), and
- (d) Web 2.0 Driven SECI Model.

All these four models were used to explain the application of Web 2.0 tools to enhance KM practices in academic libraries. This is due to the relationship among the models in explaining the research been investigated. Therefore, the link between the models and the research problem of the study are as discussed below:

The Academic Library 2.0 model was used to explain the access and use of Web 2.0 tools in academic libraries. It was developed by Michael Habib in 2006 to explain the relationship between library staff and the new breed of Web services (Web 2.0 tools) (Habib 2006). The access and use of Web 2.0 tools in academic libraries could also be termed as Library 2.0 (L2) (Maness 2006). Library 2.0, on the other hand, is the integration of Web 2.0 features in the library web-based services (Kim and Abbas 2010; Maness 2006). Maness (2006) has defined “Library 2.0” as “the application of interactive collaborative and multimedia web-based technologies to web-based library services and collections.” Further, Rawtani (2011) explains that:-

Library 2.0 simply means making your library’s space (virtual and physical) more interactive, collaborative and driven by user needs. Examples of where to start to include interactive web-opac, question points, Blogs, Wikis, Gaming nights for teens, collaborative photo sites, and etc. The basic drive is to get people back into the library by making the library relevant to the user wants and need in their daily lives...to make the library a destination and not an afterthought.

Library 2.0 services are clearly built upon and beside existing library services and values. Jena and Khuntia (2008) assert that Library 2.0 could invigorate the ways library staff serves and interacts with library users. It creates an environment in which users can easily communicate and collaborate online to satisfy their information needs and provide suggestion to academic libraries on how such libraries could improve and offer better services.



The heart of Library 2.0 is user-centered service (Jena and Khuntia 2008:217). Library 2.0 is a model for library service that encourages constant and purposeful change, inviting user participation in the creation of both physical and virtual services they want to be supported by consistently evaluating services (Jena and Khuntia 2008).

There are two ways that inaccurate use of the language misrepresented the meaning of the term Library 2.0. The first occurs when necessary attributes of Library 2.0 services are referred to as the definition. For example, Casey and Savastinuk (2006) offer the following definitions in their article presented in the library journal as:-

The heart of Library 2.0 is user-centered change. It is a model for library service that encourages constant and purposeful change, inviting user participation in the creation of both the physical and the virtual services they want, supported by consistently evaluating services...

...What makes a service Library 2.0? Any service, physical or virtual, that successfully reaches users, is evaluated frequently and makes use of customer input is a Library 2.0 service. Even older, traditional services can be Library 2.0 if the criteria are met. Similarly, being new is not enough to make a service Library 2.0.

The above definitions appear to promote the same user-centered approach to services that has been practised by progressive librarians for years. However, there are some librarians resistant to change and insulated from the outside world and yet there have always been innovators pushing the limits of library services. Consequently, there must be more to Library 2.0 than what is presented in the above definitions. Library 2.0 invites user participation in the creation of both the physical and virtual services. However, it also has its roots in Web 2.0 concepts.

Habib (2006) explains that Library 2.0 describes a subset of library services designed to meet users' needs which are caused by the peripheral effect of Web 2.0. In other words, Web 2.0 precipitates changing user needs; while Library 2.0 services meet those needs (Habib 2006). Further, Habib (2006) adds that Web 2.0 defines itself as one subset of the Web that is evolving from an earlier Web subset. On the other hand, Library 2.0 can, and should, be extended beyond web services, even when its origin lies in Web 2.0 and the related changes in web services.

Accordingly, the use of Web 2.0 instead of Library 2.0 should not be taken to represent an entirely new generation of library services, but instead to represent a subset of new library services that are occurring

because of the changes brought on by Web 2.0 services. Thus, the “2.0” in Library 2.0 signifies the term’s relationship to Web 2.0, while the “2.0” in Web 2.0 signifies its differences from Web 1.0 (Habib 2006). Despite the fact that this study employed Academic Library 2.0 model, the total idea was in the access and the use of Web 2.0 instead of Library 2.0 because Web 2.0 is broader and it covers Library 2.0 concept. In other words, Library 2.0 has no meaning beyond the already well established user-centred approach that has long been applied by progressive librarians (Habib 2006).

The use of Web 2.0 tools in most of the academic libraries is still low and unplanned (Kwanya, Stilwell and Underwood 2012; Lwoga 2013; Lwoga 2014; Makori 2012; Muneja, Paul and Abungu 2012; Penzhorn 2013). Lack or low access and use of Web 2.0 tools prohibit the management and progress of various library services. Web 2.0 tools offer new services, models, methods and technologies that can be adapted to improve library services. Habib (2006) provides the following direct effect of Web 2.0 services in academic libraries:-

- (a) Web 2.0 services have a direct effect on library users’ information seeking behaviours, communication styles and expectations. Web 2.0 concepts and methods might affect academic libraries through direct application of these. For example, allowing library users tagging in the OPACs;
- (b) Web 2.0 services also have a direct effect on library services through providing sharing sites such as Flickr whereas library staff could easily share photos with library users;
- (c) Web 2.0 services might also affect library services through cultural and behavioural changes such as promoting and marketing library services through MySpace account; and
- (d) Web 2.0 services also affect library services through changing information literacy courses due to the transformed information landscape such as Wikipedia, Muddling up issues of authority.

Web 2.0 services have many advantages in academic libraries setting. This is due to the fact that academic libraries are in a unique position to apply Web 2.0 concepts. Thus it is very important for academic libraries to incorporate Web 2.0 to foster academic works. Therefore, the proposed Academic Library 2.0 Model is very important in academic libraries which are planning to integrate Web 2.0 tools for innovative service delivery. The Academic Library 2.0 Model is based on the idea that students’ life is divided between the social and the academic, and that; physical libraries have traditionally provided a unique location that mixes the two. Therefore academic libraries not only provide reading materials but

also creating a conducive environment by which students can communicate, participate, collaborate and share online information through the utilisation of Web 2.0 tools.

The Academic Library 2.0 Concept Model includes interaction types as well as physical places. Instead of focusing on exact tasks such as shaking hands (physical) or commenting (virtual), this model looks at interactions from a broader perspective (Habib 2006). The Academic Library 2.0 Model helps academic libraries to design virtual places according to the types of interpersonal interactions which library users are going to face in those environments. Therefore, while academic libraries have been having places for reading, the Academic Library 2.0 Concept Model is a place of both reading and writing through the application of Read/Write Web service offered by Web 2.0 tools (Habib 2006).

Traditionally, excluding study spaces, academic libraries expected their members to use the knowledge obtained and gained from such libraries to assist them with their reading and teaching activities. Eventually, this knowledge would trickle back in through traditional media sources such as journals and books. Habib (2006) asserts that one way to look at the Read/Write Web in relation to publishing is that it has accelerated this process. Now it is possible for readers to feed their knowledge back into the system in real-time and at a reasonable speed.

The study has employed KMS Success Model to explore the factors that affect the application of Web 2.0 tools to enhance KM practices in academic libraries. Knowledge is embedded and flows through multiple entities within a firm including; individuals with domain expertise, specific best-known methods, or lessons learned from similar experiences, documents, routines, systems, and methods (Kulkarni, Ravindran, and Freeze 2006:309). The advent of ICTs and the development of Web 2.0 tools have dramatically advanced in both, the ability and the affordability, and it is designed specifically to facilitate KM practice; these are termed KMS (Alavi and Leidner 2001). The strategy of utilising a KMS to create, capture and distribute knowledge often requires individuals contribute their knowledge to a system instead of keeping it to themselves or sharing it directly with the ones known only through conversations or written personal exchanges (King and Marks 2008).

Alavi and Leidner (1999) explain that scholars and practitioners in various fields have turned their attention to KMS as a means of sharing knowledge in organisations. Alavi and Leidner (1999) assert that KMS are a class of information systems that focus on the creation, gathering, organising and disseminating an organisation's knowledge. There are two common types of KMS which are knowledge repositories and knowledge maps. Gray (2000:176) adds that knowledge repositories and knowledge

maps help to improve employees' ability to search for and find knowledgeable individuals within organisations. In this study, the knowledge repositories were reported as one of the benefits of KM practices. Gray (2000:176) has defined knowledge repositories as databases of documents written by knowledgeable individuals. These need to be in an organised manner for retrievability, review, editing and storage.

Further, Wu and Wang (2006) add that KMS is an "integrated, user-machine system for providing information or knowledge to support operations, management, analysis, and decision-making. KMS believed to enhance KM practices by allowing many participants to participate in the process. Thus, successful KMS use improves its perceived value which leads to the higher use (Gray 2000:176). Gray (2000:176) explains that individuals who are regularly asked to contribute to specific knowledge will become increasingly specialised, which will increase the need for integrating mechanisms such as KMS.

The emergence of Web 2.0 tools has advanced dramatically in both capability and affordability to capture, store, share and communicate knowledge. Thus, many organisations are developing KMS to facilitate KM practices. However, the application of KMS to enhance KM practices is still low and unplanned in the majority of academic libraries. The scarcity of models and frameworks developed from empirical surveys that attempted to evaluate KMS success motivated this study. Kulkarni, Ravindran and Freeze (2006:211) add that there is the lack of adequate theoretical modelling and empirical examination of factors leading to KMS success. Lack of models to evaluate KMS success had raised the important issues of establishing a measurement model that can be used to investigate the KMS success and suggest ways to improve its usage (Wu and Wang 2006).

This study, therefore, has selected Jennex and Olfamn KMS Success Model (Jennex and Olfman 2003) which was then validated to investigate the factors that affect the access and use of Web 2.0 tools to enhance KM practices in academic libraries and validate its use in this study. Jennex and Olfman present a KMS Success Model that is based on the Delone and Mclean IS success model (Delone and Mclean 2002). Kulkarni, Ravindran and Freeze (2006:313) add that in making the change from information to knowledge, IS researchers have recognised that knowledge is a multidimensional construct with more complex characteristics than those of information.

Kulkarni, Ravindran and Freeze (2006:314) explain that KMS Success Model proposes a specialisation of Delone and Mclean's IS success model to a specific type of IS that is, a KM system. Jennex and Olfman KMS Success Model evaluates success as an improvement in organisational effectiveness based on the

use of and impacts from the KMS (Jennex and Olfman 2003). Jennex and Olfman KMS Success Model employs five constructs to explain its functionalities in KM environments. These include system quality, knowledge/information quality, use/user satisfaction, perceived benefit and net benefits. Therefore, the validated model has then renamed the KMS Success Model which includes system quality, knowledge quality, service quality, user satisfaction, intention to reuse the system, and net benefits.

This study has employed knowledge creation theory to explain the creation and sharing of knowledge among library staff in academic libraries. Nonaka, Toyama, and Konno (2000) had developed the model of knowledge creation consisted of three elements: SECI processes (the process of knowledge creation through conversion between tacit and explicit knowledge); the *ba* (the shared context for knowledge creation) and knowledge assets (which includes inputs, outputs, and moderator of the knowledge-creating process) (Nonaka, Toyama, and Konno 2000).

Generally, Knowledge Creation Model (SECI) Model is used to explain how knowledge creation is achieved through conversion of knowledge from one form to another, the role of space/*ba* in knowledge creation, and finally the role of management and organisational leaders in facilitating knowledge creation (Nonaka 1991; Nonaka 1994; Nonaka and Takeuchi 1995).

Nonaka and Toyama (2003) add that knowledge creation is a process that starts with socialisation as a process of converting new tacit knowledge through knowledge shared experiences in day-to-day social interaction. Nonaka et al. (1994) add that knowledge creation process takes place when all four of the SECI processes of knowledge creation organisationally form a continual cycle. Further, organisational knowledge creation involves developing new contents or replacing existing contents within the organisation's tacit and explicit knowledge through SECI processes which are not pure, but which are highly interdependent and intertwined (Alavi and Leidner 2001:116). Therefore, SECI processes are considered as the model for knowledge creation (discovery and capture) (Becerra-Fernandez, Gonzalez, and Sabherwal 2004).

On the other hand, SECI processes of Nonaka et al. (1994) describe the ways in which knowledge is shared through interactions between tacit and explicit knowledge (Becerra-Fernandez and Sabherwal 2001). Lack of models and/or frameworks which are used to explain the creation and sharing of knowledge in academic libraries is among the challenges motivated this study. Despite the fact that Knowledge is created and shared every day in academic libraries through various activities such as

teaching and learning, research and innovation, most of the academic libraries unknowingly practice KM (Alavi and Leidner 2001; Jain 2007; Maponya 2004; Mavodza 2010; Wu and Wang 2006).

The use of SECI processes in this study has helped to identify various activities that enhance creation and sharing of knowledge among library staff and the participation of library staff in each activity. Socialisation (from tacit to tacit) is a process of sharing of experience (ways of thinking or technical gestures) and creating knowledge as a group. It involves sharing the tacit knowledge and experience possessed by individuals with other group members through practical exercise and physical proximity (Nonaka 1994; Nonaka and Takeuchi 1995).

Activities which could be performed under socialisation process within academic libraries include: knowledge gathering from various library activities, sharing experiences with library staff and library users, enhancing interaction, conducting departmental meeting with external experts in the field of library, information science, and setting a social place/room within the library with Television (TV) Set, radio, newspapers, magazines and pictures where people can use the place as a recreation centre to socialise.

Externalisation (from tacit to explicit) is a process of formalising tacit knowledge into explicit concepts or concepts that are comprehensible for the organisation or any individual through their articulation and transformation into readily understood devices (Nonaka and Konno 1998). Examples of library activities which could be performed to demonstrate the externalisation process are: developing and disseminating brochures, leaflets and posters; engaging in library various groups and becoming members in the library; participating in writing and documenting minutes in a meeting; participating in conducting CAS; and exchanging ideas and opinions with colleagues. Combination (from explicit to explicit) is a part of a process that synthesises explicit concepts and brings them to a knowledge base by following procedures (Nonaka and Konno 1998).

Further, library activities which could be performed under combination process include:- facilitating acquisition and integration of knowledge; participating in strategic planning and operations by using published literature; preparing research proposals; participating in writing guidelines, reports, literature, policies/strategies; and developing and creating training materials and disseminate them to library users. Internalisation (from explicit to tacit) is the absorption of explicit knowledge into tacit (Nonaka 1994). Library activities which could be performed under internalisation process include participating in learning and training activities within the library/institution; presenting papers in conferences and workshops;

participating in conducting a survey and sharing results with the entire library, and participating in the Selective Dissemination of Information (SDI) (Nonaka and Konno 1998).

Ramírez, Morales, and Aranda (2012:166) add that epistemological and ontological dimensions of knowledge produce a “spiral” model of knowledge in which knowledge is created through the dynamic interaction between different modes of knowledge conversion. The tacit knowledge acquired through socialisation is then made explicit through externalisation and is then combined to produce new explicit knowledge. This new knowledge is internalised as new, more advanced tacit knowledge, and the knowledge which could be shared among users.

The interactive spiral process takes place both intra- and inter-organisationally. Therefore, knowledge is transferred beyond organisational boundaries, and the knowledge from different organisations interacts to create new knowledge (Nonaka, Toyama and Konno 2000:12). Knowledge creation and knowledge sharing follow a continuous process, whereby, when new knowledge is created through various activities, such knowledge will be shared, and subsequently, this leads to the creation of more new knowledge which is then shared. Organisational knowledge creation is a never-ending process that upgrades itself continuously (Nonaka, Toyama, and Konno 2000:12).

Hislop (2013) provides three fundamental elements in which the knowledge is conceptualised in Knowledge Creation Theory as follows: knowledge is defined “as a justified true belief”,. This means that knowledge gives people the ability to define and understand situations and act accordingly, and there is a distinction between tacit and explicit knowledge (Hislop 2013; Nonaka, Toyama, and Konno 2000). Knowledge is dynamic since it is created in social interactions among people within organisations and is also a context-specific as it depends on a particular time and space (Nonaka, Toyama and Konno 2000:7).

Knowledge or justified true beliefs emerge from a process of dialogue among people, whereas people become exposed to others with different perspectives, and with people’s knowledge being born of the multiple perspectives of human interaction (Hislop 2013; Nonaka, Toyama, and Konno 2000). On the other hand, in the process of dialogue, conflict may exist between competing perspectives, with knowledge resulting from the process via which people (attempt to) justify their personal beliefs. Thus knowledge is closely linked to, and inseparable from how people act and behave (Hislop 2013:107).

In this backdrop, this study has used the Knowledge Creation (SECI) Model by adopting its indicators as proposed by other authors as follows: first, the SECI processes have become widely accepted (Becerra-

Fernandez and Sabherwal 2001; Becerra-Fernandez, Gonzalez, and Sabherwal 2004; Choi and Lee 2002; Lee and Choi 2003; Nonaka et al. 1994; Teerajetgul and Charoenngam 2006), used in variety of management fields (Choi and Lee 2002); and, include not only knowledge creation but also knowledge sharing as important dimensions of KM (Choi and Lee 2002; Lee and Choi 2003).

There a good number of empirical studies (Choi and Lee 2002; Lee and Choi 2003; Nonaka et al. 1994; Teerajetgul and Charoenngam 2006) that provide the significant relationship between the SECI processes and knowledge creation. On the other hand, Becerra-Fernandez, Gonzalez, and Sabherwal (2004), as well as Becerra-Fernandez and Sabherwal (2001), provide the strong relationship between the SECI processes and, knowledge creation and sharing. Therefore, employees' intention to be involved in the SECI Model could be considered as their indication to be involved in KM process, therefore, indicate the readiness of an organisation in embarking on KM initiatives.

Web 2.0 Driven SECI Model is based on the learning process. The model was adopted in this study to explain the relationship between KM practices and Web 2.0 tools. It was established about 15 years when Web 2.0 concepts seem to be an ideal fit with Nonaka's SECI approach opening new doors for more personal, dynamic, and social learning on a global scale (Shang et al. 2011:178). Even though the model was based on the learning process, it also fit in KM strategy especially in the collaboration with Web 2.0 applications. The model resembles the original SECI Model and it also incorporates four knowledge conversions (SECI processes), which are then linked with Web 2.0 tools such as the Blog, Wiki and RSS Feeds.

The Web 2.0 Driven SECI Model has been employed to provide the application of various Web 2.0 tools to facilitate KM practices in academic libraries. Shang et al. (2011:178) explain that the Web 2.0 Driven SECI Model helps to understand how Web 2.0 technologies impacts KM practices and how users be leveraged as a strategic source for service growth and sustained advantage. The use of SECI Model alone could limit the application of Web 2.0 tools to enhance knowledge creation and sharing practices. Hosseini (2011) adds that the SECI Model, as a practical framework for online collaborative learning, could provide the online teaching-learning mechanisms as well as knowledge creation and sharing platforms. Chatti et al. (2007) explain that varieties of Web 2.0 tools were found in each of the SECI processes. Web 2.0 tools are prevalent in SECI processes and thus, they could be used for the variety of purposes including sharing experiences, presenting papers, and collecting information from users (Chatti et al. 2007; Shang et al.2011).



Shang et al. (2011:178) assert that Web 2.0 technologies build a platform on which users can exchange knowledge, express thoughts and reconfigure existing explicit knowledge. Such platform can lead to new and more complex knowledge. Therefore, based on Web 2.0 Driven SECI model, Davenport and Prusak (1998) provide that most of KM projects have the following aims:-

- (a) To make knowledge visible and show the role of knowledge in organisation;
- (b) Developing knowledge intensive culture by encouraging and aggregating behaviour such as knowledge sharing (as opposed to hoarding) and proactively seeking and offering knowledge; and
- (c) To build knowledge infrastructure –not only knowledge system, but the web of connections among people given space, time, tools and encouragement to interact and collaborate.

Chatti et al. (2007) provide the link between SECI Model and Web 2.0 tools to enhance knowledge creation and sharing of knowledge through the application of Web 2.0 Driven SECI Model:-

- (a) Socialisation occurs when individuals or groups share methods, understanding, experience and skills through observation, imitation, practice and participation in different social communities. Socialisation starts with the building a “field” or “space” of social interaction. Through the application of Web 2.0 Driven SECI Model, Web 2.0 tools provide great opportunities to build such spaces and hand on tacit from one person to another. The use of Web 2.0 tools such as VoIP, e-mails, tagging, phone/video-conferencing and instant messaging could support socialisation process which includes dialogues and discussions that could capture context-rich knowledge when it is being created;
- (b) The use of Web 2.0 tools such as Blogs could support the process of externalisation process by giving voice to everyone and providing a space for capturing a personal knowledge and distributed discussions across Blogs, immediately document thoughts and annotate information. In this process, tacit knowledge can be expressed but cannot be easily recorded in formal documents and manuals; however, can be verbalised via oral communication. In this process, Web 2.0 tools, therefore offer unique means for effective capturing of the context-rich and quality knowledge as it gets created with the minimum amount of effort. The collective intelligence ensures that knowledge is up to date and relevant. Most of Web 2.0 tools provide time and date when information was sent and shared among members. Wikis are a good example of collective intelligence at work since they can provide an opportunity for social interaction and collective knowledge capturing. Further, Web 2.0 tools provide effective ways to capture and publish

knowledge in a number of ways and in a variety of media such as pictures, video and audio recording;

- (c) The combination is a process of systematising concepts into a knowledge system and it integrates different bodies of explicit knowledge. Under this process, when knowledge is captured it becomes explicit knowledge. The captured knowledge/information can then be transferred to a social context. Web 2.0 tools such as Blogs and Wikis can allow quick and wide information dissemination across classroom, library and within organisation boundaries. Information is individually and collectively captured. For example, Blog is a very valuable tool for personal management, and Wikis and Folksonomies are highly effective forms of collaborative information management. During the combination process, reconfiguration of existing explicit knowledge through adding, reorganising and combining can lead to new knowledge possibly more complex. Other Web 2.0 tools such as RSS Feeds, Folksonomies and Mashups are good examples of combining and remixing knowledge to form new knowledge and community; and
- (d) Through internalisation process, explicit knowledge is internalised into individual's tacit knowledge bases in the form of mental models or technical know-how. Internalisation is also a process of continuous individual and collective reflection. Web 2.0 functionalities, such as content editing and co-development, can provide platforms for co-creation among participants enabling knowledge internalisation through reflection on what has been learned.

### **3.3 Conceptual framework and research hypotheses development**

This study has evaluated theories and models used to guide this study and come up with the conceptual framework. Guba and Lincoln (1989) explain that a conceptual framework is a research tool intended to assist a researcher to 'develop awareness and understanding of the situation under scrutiny and to communicate this'. When clearly articulated, the conceptual framework has a potential usefulness as a tool to assist a researcher in making meaning of subsequent findings. Based on the advantages of using theoretical and conceptual frameworks for postgraduate studies Ngulube, Mathipa, and Gumbo (2014) assert that:

Research in social and management sciences does not have a tradition of adequately explicating the notion of conceptual and theoretical frameworks. Consequently, the understanding of the development and use of theoretical and conceptual frameworks may be limited. In fact, some researchers do not fully understand what it means to adopt a theoretical or conceptual framework (Ocholla and LeRoux 2011). Theoretical and conceptual frameworks are ignored or

misunderstood because they are described and alluded to by many methodologists, but very few of them fully explain or clarify the two constructs (Leshem and Trafford 2007) and their role in research.

This study has premised on both positivism and interpretivism paradigms. Ngulube (2015) explains that positivism and Interpretivism paradigms are the broad frameworks in which research is conducted. O’Leary (2004:5) adds that positivism aims to test a theory or describe an experience “through observation and measurement to predict and control forces that surround us”. On the other hand, the methodology of positivism is quantitative while that of interpretivism is qualitative (Ngulube 2015).

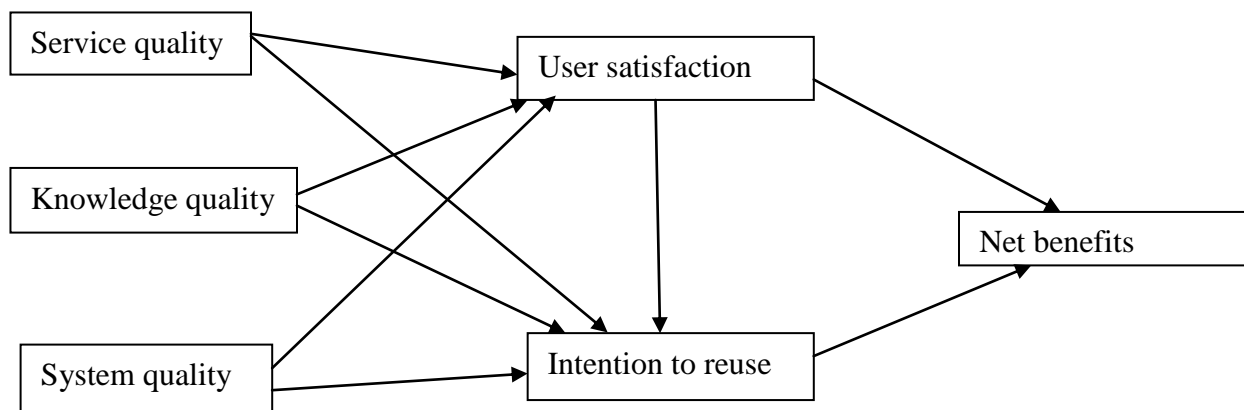
In this study, a quantitative approach has been regarded as the dominant approach. Many quantitative studies are theory-driven and mainly concerned with testing or verifying theories rather than developing them. This is also supported by Ngulube, Mathipa, and Gumbo (2014) who are of the view that theory and research from the positivism paradigm (i.e. deductive approach whereby research mainly starts with a theory) and the interpretivism one (i.e. an inductive approach which starts with observations to build up theories and generations).

Ngulube, Mathipa, and Gumbo (2014) have a further state that social science researchers start out with models, then progress to concepts that represent an identified research problem within a subject and collect data to understand and establish linkages between concepts. Theories drive almost all phases of the research cycle because quantitative studies generally use deductive approach. This study has integrated various Web 2.0 tools and KM theories as explained in this study to formulate a conceptual framework which has been employed to guide this study. The ideas were also supported by Marrison (2007) who adds that “theory gathers together all the isolated bits of empirical data into a coherent conceptual framework for wider applicability”. Celine (2011) suggests that models may lead to the formulation of theories, which in turn “lead to the construction of another model for the verification of a theory”. Therefore, the conceptual framework used in this study based on KMS model which was adapted from Jennex and Olfman KMS Success Model (Jennex and Olfman 2003) then validated and modified to fit in this study. Figure 3.2:2 (Chapter Three Section 3.2.2) presents Jennex and Olfman KMS Success Model (Jennex and Olfman 2003).

Ngulube, Mathipa, and Gumbo (2014) explain that researchers need to describe their theoretical framework, including the origin of the theory and why and how it was selected, adapted and used. Among the advantages of KMS Success Model developed by Jennex and Olfman (2003) was to support

the creation of knowledge through various methods such as extraction, manipulation, codification and visualisation whereby users can create new knowledge by establishing new relationships between knowledge and incorporating such knowledge into a new cognitive understanding/mental models.

The adapted Jennex and Olfman KMS Success Model was validated modified and then renamed KMS Success Model. KMS Success Model contains the following constructs: service quality, system quality, knowledge quality, intention to reuse, user satisfaction and net benefits. Service quality in Jennex and Olfman (2003) KMS Success Model was used as a part of system quality dimensions. However, Jennex and Olfman KMS Success Model has been employed to support knowledge creation. The KMS Success Model in this study was employed to investigate the factors that affect the application of Web 2.0 tools (KMS) to enhance KM practices (knowledge creation and knowledge sharing). Thus, Figure 3.3:1 presents KMS Success Model created to guide this study.



**Figure 3.3:1 KMS Success Model**

Therefore, the descriptions of the constructs used in KMS Success Model include the following:

***Service quality***

Service quality refers to the overall support provided by the service provider such as ICT department, or any other specific unit within the organisations and/or outsourced services (Delone and Mclean 2004). Parasuraman, Zeithaml, and Berry 1985:46) explain that service quality is regarded as the key to ensuring good service quality is provided or exceeding what (customers) expect from the service offered. The service quality can be conceptualised as the overall support delivered by the library, ICT department and Web 2.0 service providers such as blogger, social network sites and the like (Delone and Mclean 2004;

Petter, Delone, and Mclean 2008). The service quality is the support that the users receive from the department (academic libraries in this study) and the IT support personnel. In this study, service quality refers to the support provided by the library staff and IT personnel to facilitate the application of Web 2.0 tools to enhance KM practices in academic libraries.

The interactive and participatory nature of Web 2.0 application can influence users to use these tools for their daily services. On one hand, librarians play important roles in providing the support to library users in Web 2.0 environment by providing promised services dependably and accurately (reliability); providing prompt assistance (responsiveness); inspiring trust and confidence (assurance); and offering individualised attention to library users (empathy) (Chua and Goh 2010). Measures for service quality in this study included responsiveness, content/scope and timeliness, reliable internet, guidelines for the use, assurance, availability of technical support and reliability. Service quality was found to influence both users' satisfaction and perceived net benefits (Wang 2008). This study has investigated how service quality affects both user satisfaction and intention to reuse Web 2.0 tools. Therefore, the following hypotheses were proposed:-

H1: Service quality has a positive effect on user satisfaction in the Web 2.0 context.

H4: Service quality has a positive effect on intention to reuse Web 2.0 context.

### ***Knowledge quality***

Information quality has been used as a success measure for traditional IS; however, in the KMS context, the distinction between knowledge and information depends on the context and the user (Wu and Wang 2006). According to Jennex and Olfman (2003:2533), knowledge quality ensures the right knowledge is captured and available for the right users at the right time. Knowledge quality in this study ensures the right knowledge is created and shared for benefit of the academic libraries and their parent institutions. Knowledge strategy/process according to Jennex and Olfman (2003), looks at organisational processes such as identification of knowledge users and knowledge capture and reuse. Formalities of these processes include process planning and format, and context of the knowledge to be stored.

Jennex and Olfman (2003) mention accuracy and timeliness constructs could be used to measure knowledge strategy/process, knowledge richness and linkages between knowledge components to ensure knowledge quality. Constructs such as personalisation, completeness, relevancy, easy to understand, currency, timeliness and usability are examples of knowledge/information quality (Delone and Mclean 2004; Petter, Delone, and Mclean 2008). Knowledge quality has been found to strongly influence user

satisfaction in the context of academic libraries (Masrek, Jamaludin, and Mukhtar 2010). Previous studies of ISs have shown that knowledge/information quality have positive impacts on the perceived value and user satisfaction which in turn show significant impact on the intention to reuse the IS (Wu and Wang 2006).

Wu and Wang (2006) explain that knowledge quality has the positive influence on user's satisfaction and intention to reuse the system. Library staff perceives that the quality of knowledge as provided by Web 2.0 tools in their libraries is better than those of others; thus, they are more likely to continue using the system. Knowledge quality is, therefore, significant in investigating the user satisfaction and intention to use Web 2.0 tools. Knowledge quality constructs used in this study include reliable knowledge, accurate knowledge, relevant knowledge, understandable knowledge, completeness, practicable and meaningful knowledge and up to date knowledge. Therefore, the following hypotheses were developed in this study:

H2: Knowledge quality has a positive effect on user satisfaction in the Web 2.0 context.

H5: Knowledge quality has a positive effect on intention to reuse the Web 2.0 context.

### *System quality*

System quality is a measure of the information processing system itself (Masrek, Jamaludin, and Mukhtar 2010; Negash, Ryan and Igbaria 2003). According to Jennex and Olfman (2003) system quality defines how well the KMS performs the functions of knowledge creation, storage/retrieval, transfer and application. In the context of this study, system quality measures the desired characteristics of the Web 2.0 tools and how they could be employed to enhance KM practices in academic libraries. System quality has been found to be a strong indicator of user satisfaction in the context of IS (Petter and McLean 2009; Yang and Wu 2006), and it is moderately influenced by the perceived net benefits in IS (Petter, Delone and Mclean 2008). Therefore, library staff is more likely to continue reusing the Web 2.0 tools due to the quality of the system.

Thus, the quality of the system increases user satisfaction towards the use of Web 2.0 tools in academic libraries. Librarians are more likely to continue reusing the Web 2.0 tools services due to better interaction they have with the system. Jennex and Olfman (2003) provide the following constructs employed to measure the system quality: the amount of a number of experiences which already gained in developing and maintaining the system, the amount of a number of experiences that is used to develop and maintain the system, and the software and hardware in use. The constructs employed in this study to

measure the system quality include usability, adaptability, availability, flexibility, stability, reliability and accessibility of the system. Therefore, the following hypotheses were proposed in this study:-

H3: System quality has a positive effect on user satisfaction in the Web 2.0 context.

H6: System quality has a positive effect on intention to reuse the Web 2.0 context.

### ***User satisfaction***

User satisfaction is the level of fulfilment users feel to have with a system relative to what the user expected upon first use of the system (Jennex and Olfman 2003; Seddon 1997). Jennex and Olfman (2003) add that user satisfaction is the most applicable as a success measure when the use of a system is required. On the other hand, the effectiveness of use depends on users being satisfied with the system in use (Jennex and Olfman 2003). In the academic library setting, user satisfaction refers to the feeling of pleasure or displeasure that results from aggregating all the benefits that a person hopes to receive from the interaction with the library portal (Masrek, Jamaludin and Mukhtar 2010).

User satisfaction can be measured by using the factors such as adequacy, effectiveness, efficiency, enjoyment, information satisfaction and system satisfaction (Urbach and Muller 2012). User satisfaction factors' measured in this study include: efficiency, effectiveness, meeting knowledge needs enjoyment and adequacy. Net benefits and intention to reuse the system are significant factors of user satisfaction (Lwoga 2013; Petter and McLean 2009; Wu and Wang 2006). Therefore, the following hypotheses were tested:-

H7: User satisfaction has a positive effect on intention to use in the Web 2.0 context.

H8: User satisfaction has a positive effect on net benefits in the Web 2.0 context.

### ***Intention to reuse***

Intention to reuse the system refers to the favourable attitude of the user towards the Web 2.0 tools that result in repeated use behaviour of gathering and sharing of the content (Wang 2008). In this study, intention to reuse the Web 2.0 tools has been explained as a repeat on applying and using those tools after being satisfied with the advantages which they bring to the library. Previous IS studies have consistently indicated that intention to reuse the system is very important factor in determining information system acceptance by users in IS field (Wang 2008). Measures employed in this study to measure the intention to reuse Web 2.0 include making the right decision, recording the knowledge, communicating knowledge

with colleagues, creating specific knowledge, and sharing of such knowledge. Thus, the following hypothesis was proposed:

H9: Intention to reuse has a positive effect on net benefits in the Web 2.0 context.

### ***Net benefits***

Net benefits, according to Delone and Mclean (2004) Model refer to both positive and negative impacts of the IS to the user; however, the researcher(s) need to clearly and carefully define the stakeholders and the context in which net benefits are to be measured. Seddon (1997:246) defined net benefits as:-

An individualised comprehensive measure of the sum of all past and expected future benefits, less all past and expected future costs, attributed to the use of information technology application. Any use of resources (including time) in the building, learning to use, and/or using the system is a cost. Therefore, to measure net benefits, one has to adopt some stakeholder's point of view about what is valuable and what is not.

In the context of this study, perceived net benefits refer to the positive impact which Web 2.0 tools will bring to the library staff. Therefore, constructs used to measure the perceived net benefits in this study include new knowledge and innovation, ideas acquisition, managing and storing knowledge, tasks accomplishment, job enhancement and quality of work improvement.

## **3.4 Empirical review**

Empirical reviews indicate the gaps identified or discussed by other empirical studies which explain the study in details. In other words, empirical reviews summarise the empirical findings. Therefore, empirical reviews of this study fall under the following aspects:-

### **3.4.1 KM: an overview**

The need for KM is based on a paradigm shift in the business environment whereas knowledge is considered to attainment a sustainable competitive advantage in the organisations (Drucker 1993; Grover and Drucker 2001). KM comprises two components which are: knowledge and management. Hislop (2013:17) asserts that knowledge is an entity/commodity that people possess, while management is a process of coordinating, planning, organising, controlling and leading various activities to accomplish the



desired goals (Kude, Nalhe, and Mankar 2012; Werner 2011). Knowledge can be considered explained in a pyramid which contains data, information, knowledge and wisdom (Maponya 2004; Townley 2001).

Feather and Sturges (2003) add that the conceptual relationship among data, information and knowledge is explained in knowledge pyramid which includes Data, Information, Knowledge and Wisdom (DIKW). The bottom layer of the pyramid is data which is defined as symbols, facts and figures (Feather and Sturges 2003:341). In the academic library setting, when the context is added through cataloguing or metadata, the data become information (Townley 2001).

Data has commonly been seen as simple facts that can be structured to become information. Drucker (1998:7) defines information as “data endowed with relevance and purpose”. Information, in turn, becomes knowledge when it is interpreted, put into context, or when the meaning is added to it (Feather and Sturges 2003:341). Information is what people or systems need to be able to perform work practices. Everything that is psychological begins with information (Chen, Snyman, and Sewdass 2005).

Access to information affects one’s life in many ways. To get information, one must know where to obtain the right information. Information comes in a variety of formats (Chen, Snyman, and Sewdass 2005). According to Wiggins (2000:150), information may be stored in or on any media such as paper, electronic or microfilm, and the user may access it via any suitable mechanism, such as physically on a library shelf or via the Internet or an intranet. Figure 3.4:1 presents the primary sources of information.

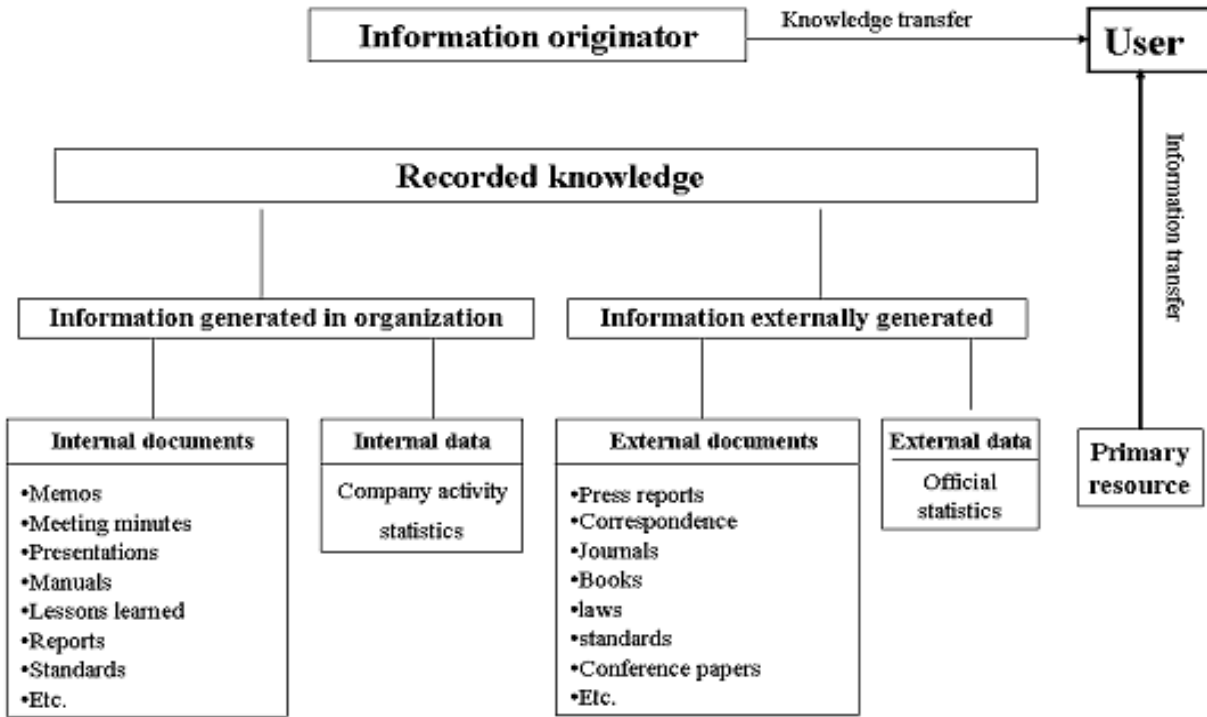


Figure 3.4:1 Primary sources of information

Rumizen (2002) views knowledge as information and indicates an interrelationship between information and knowledge; this view shows how information and knowledge are closely associated with each other. Nonaka, Toyama and Hirata (2008:12) explain that people’s knowledge or justified true belief emerges from a process of dialogue with others and where people become exposed to others. Chen, Snyman, and Sewdass (2005:6) define knowledge as:-

Knowledge is a combination of contextual information and the individual awareness and understanding of facts, truths or information acquired through reasoning, experience and learning. In organisations, knowledge often becomes embedded not only in documents or repositories but also in organisational routines, processes, practices and norms. Knowledge can be obtained from individuals, groups of the knower, and sometimes in organisational routines and processes. It is delivered through structured media such as documents, and person-to-person connections. New knowledge is created and acquired through experience, interacting and learning.

Feather and Sturges (2003:341) explain that knowledge is a mix of conceptual information, experiences, context, rules and values. Although information is simply contextualised data, to become knowledge, it needs to have a human element. Information tends to be tangible, whereas knowledge is information that

is interpreted and synthesised. Further, Kakabadse, Kakabadse, and Kouzmin (2003) add that the terms “knowledge” and “information” are often used interchangeably in most KM literature but a distinction is helpful. Plato (1953) first defined the concept of knowledge as “justified true belief” in his *Meno Phaedo and Theaetetus*.

Knowledge as a “justified true belief” is that which people believe and values on the basis of the meaningful and organised accumulation of information through experience, communication or inference (Blacker 1995). In addition, Hislop (2013) discusses epistemology of knowledge which includes the following:-

- (a) Knowledge gives people’s ability to define and understand situations and then act accordingly. Hislop (2013:107) explains that knowledge is closely linked to and inseparable from how people act and behave. In this case, knowledge is highly practice-based and that the relationship between knowledge and action is two-way: thus, not only does people’s knowledge (justified true beliefs) shape how they act and behave, but the relationship also operates in the opposite direction with consequences of people’s actions shaping their knowledge (Hislop 2013:107-108); and
- (b) There is a distinction between tacit and explicit knowledge which represents distinctive and different forms of knowledge. In this dimension, knowledge can be uttered, formulated in sentences, captured in drawings and writings (Nonaka 1994). Knowledge is tied to the senses, movement skills, physical experiences, intuition or implicit rules of thumb, is tacit (Hislop 2013).

In short, knowledge differs from information in that it can be put into action while information is given to end-users who transform it into knowledge through actions (Feather and Sturges 2003:341). What is knowledge for one person can be information for the other (Chen, Snyman, and Sewdass 2005).

Townley (2001) adds that when knowledge is combined with synthesis, it becomes wisdom. On the other hand, wisdom is an extrapolative and nondeterministic, non-probabilistic process, which depends upon all the previous levels of consciousness, and specifically upon special types of human programming such as moral and ethical codes (Feather and Sturges 2003). Libraries have excelled in creating scholarly information and intelligence from data, but they have tended not to create knowledge from intelligence. Moreover, they have not been as successful in generating organisational knowledge to achieve library goals (Townley 2001). The real-time interactions and exchanges of information and knowledge have been somehow limitedly practised.

KM is one way to develop and apply the organisational knowledge needed to improve library operations and, ultimately, library effectiveness (Townley 2001). Swan, Scarbrough and Preston (1999) also add that KM not only involves the production of information but also to capture of data at the source, the transmission and analysis of this data, as well as the communication of information based on or derived the data to those who can act on it. In addition, data and information can be integrated to generate knowledge (Hislop 2013). Table 3.4:1 provides the relationship among data, information and knowledge.

Table 3.4:1 The relationship between data, information and knowledge

<b>Data</b>	<b>Information</b>	<b>Knowledge</b>
Simple observations of states of the world	Data endowed with relevance and purpose	Valuable information from the human mind: includes reflections, synthesis, context
i. Easily captured	i. Requires unit of analysis	i. Hard to capture electronically
ii. Easily structured	ii. Needs consensus on meaning	ii. Hard to structure
iii. Easily transferred	iii. Human mediation necessary	iii. Often tacit
iv. Compact, quantified	iv. Often garbled in transmission	iv. Hard to transfer
		v. Highly personal to the source

Source: Pearlson and Saunders (2009:346)

There are two major types of knowledge which are tacit and explicit knowledge (Hislop 2013); some of the knowledge is explicit; however, much of knowledge is tacit (Chen, Snyman, and Sewdass 2005). Tacit knowledge is the knowledge that people possess and which is stored in human minds. Hence, it cannot be easily communicated and shared (Lloria 2008:83). Irick (2007) defines tacit knowledge as personal, internal or interior knowledge deeply rooted in individuals' experiences, ideas, norms and values and emotions. Tacit knowledge is difficult to put into words because it is highly personal and hard to communicate and to share with others (Jain 2009). Further, Wickramasinghe (2007) suggests that tacit knowledge is experiential "know-how" representing knowledge that is gained through experience and doing. Tacit knowledge is the very complex form of knowledge and it has two dimensions namely technical and cognitive (Rajurkar 2011).

The technical dimension encompasses the kind of informal personal skills or crafts often referred to as "know-how" while the cognitive dimension consists of beliefs, ideas, values, schemata and mental models which are deeply ingrained in us and which we often take for granted (Nonaka and Konno 1998; Rajurkar 2011). Among the important aspect of tacit knowledge is that expertise rests on it, which makes tacit knowledge a competitive advantage. Luen and Al-Hawamdeh (2001) view tacit knowledge as possessed

by individuals and communities that are optimised through the creation of communities of practice that can hold, share, and grow tacit knowledge.

Jain (2011) is the view that tacit knowledge can be achieved through face-to-face meetings, teleconferencing and electronic discussions, whilst Nonaka and Takeuchi (1995) think that tacit knowledge can be transmitted through social interactions between individuals; that is, through the socialisation component of the SECI Model. Through dialogues, discussions, experience-sharing and observations, tacit knowledge is amplified at the group or organisational level. In addition, tacit knowledge represents knowledge based on individuals', experiences and skills of employees (Li and Zhu 2009).

On the other hand, explicit knowledge is the knowledge which can easily be collected, communicated, organised, documented and transferred through digital means (Jain 2007:138; Pearson and Saunders 2009: 346; Rajurkar 2011: 2; Shanhong 2000: 313). Wickramasinghe (2006:365) explains that explicit knowledge is a formal knowledge that is, "knows-what". It represents knowledge that is well established and documented (Gottschalk 2005; Hislop 2013); and it can be expressed in words and numbers and can be shared in the form of data, scientific formulae, specifications, and manuals ( Nonaka and Konno 1998:42). Explicit knowledge is objective, theoretical and codified for transmission in a formal systematic method (Hislop 2013:21; Pearlson and Saunders 2009:351). It can also be easily transmitted between individuals both formally and systematically (Gottschalk 2005:22). Table 3.4:2 presents examples of both tacit and explicit knowledge.

Table 3.4:2 Example of tacit and explicit knowledge

Tacit knowledge	Explicit knowledge
<ul style="list-style-type: none"> <li>i. Knowledge on how to identify the key issues necessary to solve a problem</li> <li>ii. Applying similar experiences from past situations</li> <li>iii. Estimating work required based on intuition and experience</li> <li>iv. Deciding on an appropriate course of action</li> </ul>	<ul style="list-style-type: none"> <li>i. Procedures listed in a manual</li> <li>ii. Books and articles</li> <li>iii. News reports and financial statements</li> <li>iv. Information left over from past projects</li> </ul>

Source: Pearson and Saunders (2009:351).

Polanyi (1996) sees tacitness and explicitness as the two dimensions of knowledge. Hence, "all knowledge is either tacit or rooted in tacit knowledge" (Polanyi 1996:7) and as such is human activity.

Polanyi (1996) adds that even if knowledge has been articulated into words or mathematical formulae, this explicit knowledge must rely on being truly understood and applied. Therefore, every aspect of knowledge, including explicit dimensions, is accrued over time, in a strict sense, tacit knowledge is inherently non-transferable but it becomes explicit once it is transformed and/or codified (Hislop 2013; Polanyi 1996).

Knowledge is embedded in the processes and documentation as explicit knowledge and in the heads of the workers as tacit knowledge (Mavodza 2010). Undoubtedly in managing knowledge, academic librarians need to act as:-

- (a) Facilitator of tacit knowledge development, use, capture and exchange, where the goal would be to encourage knowledge awareness demonstrating the benefits of collaboration and learning; and
- (b) Catalyst of knowledge, where the goal would be to convert tacit knowledge into explicitly communicable messages i.e. explicit knowledge. High-value explicit knowledge would be captured as corporate memory in a knowledge-base consisting of purposeful collections of material, designed to contribute to the sets of understandings of specific user groups to enable them to perform their work more effectively (Chandra 2005:254).

However, the greater challenge for information professionals is on managing the tacit intuitions and know-how knowledge worker acquire through years of experiences and practices. The tacit transfer involves people and social skills such as communication and it is always possible or appropriate to capture tacit knowledge and treat it as explicit knowledge. Therefore, academic libraries need to make the use of knowledge existent within peoples' minds (tacit knowledge) to make them accessed and shared (codification strategy); and the knowledge stored in documents, books and electronic resources such as databases (explicit knowledge) so as to create new knowledge and to promote knowledge sharing (Wen 2005). In this case, academic libraries need to manage both tacit and explicit knowledge for the benefit of the parent institutions (Maponya 2004:13).

The process of dynamic knowledge creation occurs during socialisations when internal (tacit) knowledge is made external (explicit). The spiral that operates between tacit and explicit knowledge continually affecting new knowledge among workgroups creates the energy and innovation that characterises an active knowledge-intensive and knowledge-creating organisation (Chen, Snyman, and Sewdass 2005). Figure 3.4:2 illustrates how tacit knowledge and explicit knowledge interact through internal and external

processes within and among people in an organisation, and a continued movement between two very different types of knowledge.

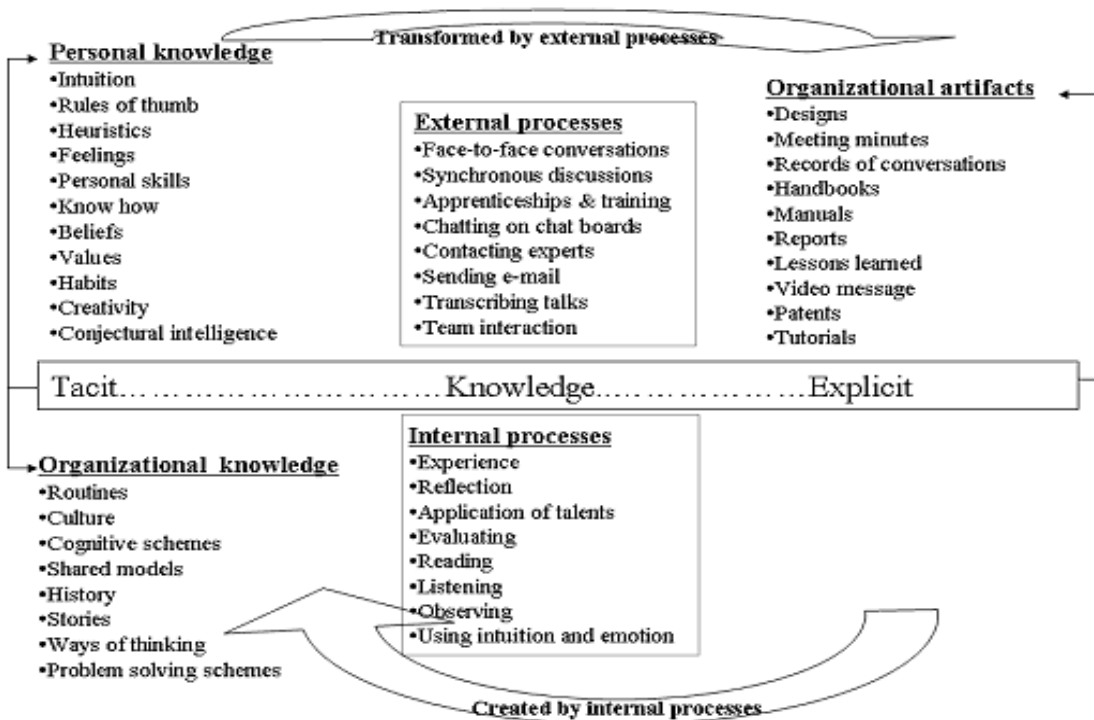


Figure 3.4:2 Tacit –explicit knowledge continuum

This study has employed SECI Model to explain the creation and sharing of knowledge within academic libraries. It is reported that knowledge can be shared through the interaction between tacit and explicit knowledge which is facilitated by SECI processes (Nonaka et al. 1994). Knowledge creation involves developing new contents or replacing existing contents within the organisation’s tacit and explicit knowledge through SECI processes (Alavi and Leidner 2001), whereas knowledge sharing involves sharing and communicating both tacit and explicit knowledge between individuals and within groups (Karim, Razi, and Mohamed 2012).

The distinction between explicit and tacit knowledge is critical in defining the scope of KM. Chen, Snyman, and Sewdass (2005:12) define KM as:-

KM is a multi-disciplined approach to accomplishing organisational objectives by making knowledge accessible to people in the organisation through the structuring of people, technology

and knowledge content. It encompasses both the management of information (explicit knowledge) and management of individuals with specific abilities (people with tacit knowledge).

Roknuzzaman (2012) explains that the idea of the knowledge economy has accelerated the growth of KM, a new paradigm for information processing and innovation. It was therefore reported that KM is emerging as a key concern of organisations. Both business and academic communities believe that an organisation can sustain its long-term competitive advantage by leveraging knowledge (Chen, Snyman and Sewdass 2005). Therefore, the intention of KM is to manage knowledge practically and effectively to reach broad strategic and operational objectives.

Townley (2001) points out that the emerging KM field offers academic libraries the opportunity to create knowledge to improve organisational effectiveness for both themselves and their institutions. Townley (2001) explains KM is used to capture an organisation's goal-related knowledge as well as knowledge of its products, customers, competition and processes and then sharing that knowledge with appropriate people throughout the organisation. KM seeks to support communities of practice in creating, sharing and using knowledge. It is added that librarians worldwide have developed and applied many KM principles in the provision of academic library services.

Further, KM enables libraries to generate organisational knowledge for their parent organisations. Townley (2001) asserts organisational knowledge can be divided into two groups, depending on its centrality to the organisation and its acceptability to workers. Core knowledge is composed of structures that explain broad propositions that are widely held within organisations. Peripheral knowledge supports core knowledge by addressing sub-components and does not require the widespread understanding of consensus.

Organisational knowledge is also known as explicit and tacit knowledge shared in work groups. As with individuals, this knowledge is subject to lose with the elimination or restructuring of a work group. Jain (2007) adds that KM's main purpose is to facilitate achieving organisational goals, its sharing aspect emphasises on teamwork, partnership and interpersonal relationship. Jain (2007) proposes the following components which need to be implemented to ensure proper application of KM:-

- (a) The main purpose is to achieve organisational goals efficiency;
- (b) It is based on personal experience;
- (c) It focuses on creativity and innovativeness;



- (d) It is action oriented;
- (e) It requires a system to capture staff tacit knowledge;
- (f) Organisations need a KM policy and guidelines;
- (g) It facilitates calls for updating knowledge and important documents;
- (h) There is an emphasis on identification of expertise;
- (i) It is founded on a strong culture of knowledge sharing;
- (j) It involves conducting a knowledge mapping exercise;
- (k) It requires IT facilities;
- (l) Is about working with people;
- (m) It is a positive way to achieve organisational goals;
- (n) It is based on a strategic plan;
- (o) Sees organisational knowledge holistically, so lays emphasis on having a central KR;
- (p) Is related to change management, so success depends on a learning environment; and
- (q) It embraces both tacit and explicit knowledge.

### **3.4.2 KM schools of thought**

There are different KM school of thoughts developed by various authors (Baskerville and Dulipovici 2006; Hislop 2013; Lloria 2008; Nonaka 1994; Wickramasinghe 2006). These KM schools of thought are very important to universities and academic libraries which employ some kinds of KM practices. Lloria (2008:78) adds that KM schools of thought categorise knowledge in terms of how it is created, shared and/or collaborated within organisations. Baskerville and Dulipovici (2006:83) explain that “The field of KM is built on theoretical foundations from information, commercial, strategic management, organisational culture, organisational behaviour, organisational structure, artificial intelligence, quality management, and organisational performance measurements”.

Historically, the current understanding of knowledge today is focussed to the discussions and debates of ancient Greek philosophers such as Socrates, Plato, and Aristotle; due to the fact that the knowledge constructs and trying to pin it down, as well as define the process of knowing itself, dominated their thinking (Wickramasinghe 2006). Therefore, for these ancient Greek philosophers, knowledge was a homogenous construct that ultimately was representative of the truth. Thus knowledge was truth. It is also believed that since the 19<sup>th</sup> Century, many different philosophical schools of thought have emerged, and they have all tried to once again pin this elusive, yet important knowledge construct (Wickramasinghe 2006). Therefore in trying to manage knowledge, it is necessary to understand the binary nature of it, its

objectives, and its subjective components (Malhotra 2000) or consensus/dissensus dimensions (Schultze and Leidner 2002). Table 3.4:3 presents multiple perspectives on knowledge.

Table 3.4:3 Multiple perspectives on knowledge

S/N	School of Thought	Basic Ideas on Knowledge	Some/Proponents
1	Positivism	Knowledge is gained from the observation of objective reality	Comte
2	Constructivism	Knowledge is constructed in our minds, thus is not objective	Erlangen School
3	Critical Theory	Uses knowledge to integrate the tension between reality of society and the real societal function of science	Habermas, Horkheimer
4	Critical Rationalism	All knowledge must be open to empirical falsification before it can be accepted	Popper
5	Empiricism	Knowledge can be created from experiments, and thus only mathematics and natural sciences can provide secure knowledge	Locke, Russel
6	Sociology of Knowledge	Knowledge is a socially constructed reality	Mannheim, Scheler
7	.Pragmatism	Knowledge represents a local reality based on our experiences	Dewey

According to Hislop (2013), there are three schools of thoughts which are currently applied in most of KM practices which are: commercial (commercial school), the technocratic school and the behavioural school. Therefore, the following section discusses the three schools of KM as presented by (Hislop 2013) and (Lloria 2008).

### 3.4.2.1 Commercial school

The commercial school of KM thought sees knowledge as a part of that material wealth. Vasconcelos (2008:426) explains that commercial school is based on measuring the “exploitation of knowledge as a commercial resource”. In other words, the primary aim of KM practices as presented in commercial school is to effectively commercialise an organisation’s knowledge such that an organisation can achieve measurable economic benefits from these efforts. The economic school is premised on Takeuchi’s (2001) principle of knowledge creation. Being a strategic organisational asset, the researcher believes that organisations should create platforms to create knowledge. Ngulube and Lwoga (2007) view knowledge assets as determining the inputs and outputs of the knowledge creation process. In addition, knowledge has become an organisational strategic asset (Nonaka, Toyama and Konno 2000).

Nonaka and Takeuchi (1995) suggest that knowledge is transferred from one form to another because of a continuous process of interactions between tacit and explicit knowledge in an organisation to create new knowledge which has commercial worth, and essential in innovation processes. In this case, a space called *Ba* where knowledge is created and shared through Web 2.0 tools is needed. Nonaka and Konno (1998:40) add that *Ba* can be thought of as a shared space for emerging relationships. This space can be physical (e.g., office and dispersed business space), virtual (e.g., e-mail and teleconference), mental (e.g., shared experiences, ideas, and ideals), or any combination of them. What differentiates *Ba* from the ordinary human interaction is the concept of knowledge creation.

*Ba* provides a platform for advancing individual and/or collective knowledge. It is such a platform that a transcendental perspective integrates all information needed. *Ba* may also be thought of as the recognition of the self in all. Thus, spaces are *Ba* and each knowledge conversion mode is associated with its own *Ba*. Nonaka and Takeuchi (2001) provide a knowledge creation theory with four stages of knowledge creation which includes SECI processes. This is based on ever repeating and spiralling knowledge creation processes (Ngulube and Lwoga 2007).

Vasconcelos (2008:426) asserts that the organisations in this commercial school are seen as “dynamic learning environments, communities of practice and informal learning and interaction and underlying issues of organisational politics and culture”. Chandra (2005:246) adds that “no organisation can improve without learning something new. KM is consistent with the currently emerging models of organisation, which involve people working in teams, coming together on a project basis, then moving on the new relationships. Knowledge clearly underpins these activities”. Rowley (1999) adds that many organisations are unable to function on a knowledge basis due to the learning disabilities and, hence, a key to functioning on a knowledge basis is the capability to learn.

Organisational culture, on the other hand, is very important to facilitate KM practices. Rowley (2001:235) adds that an organisation needs to have a culture that supports KM practices and to ensure that knowledge is valued and recognised as a resource. Walczak (2005) adds that KM is not only about managing knowledge per se, but rather about managing and creating a corporate culture that facilitates and encourages the sharing, appropriate utilisation and creation of knowledge that enables corporate strategic competitive advantage. Organisations that adopt a knowledge culture are more inclined towards learning and innovation. In profit-making organisations, the result of innovation can be observed by the number of new patents, design modifications of existing products and development of new products, while in academic libraries, innovation is observed by the library’s ability to provide quality information in a

timely manner and the enhanced expertise of librarians in providing new and relevant ways of library service practice (Mavodza 2010).

Academic institutions worldwide are competing in a complex and challenging environment which is being transformed by many factors ranging from globalisation, technology and telecommunication to the development and use of knowledge. Thus, the creation and sharing of knowledge conducted within academic libraries should be used as a competitive advantage to develop and create new services to satisfy users' needs.

### **3.4.2.2 Technocratic school**

Rowley (2003:434) refers to the technocratic school as the “information processing model”. The technocratic perspective focuses on the application of technology in controlling and protecting information and knowledge (Mavodza 2010). Technocratic school of KM is divided into three sub-schools namely: systematic school, cartographic school and engineering school (Hislop 2013:59). In systematic schools, the main concern is the codification of knowledge into databases, and make such knowledge available for use as an organisation resource (Hislop 2013:59). The focus is on managing knowledge (Lloria 2008), the capture and codification of information through information technologies.

Cartographic school emphasises on the use of IT systems to facilitate the creation of interpersonal connections between people who possess relevant expertise through the creation of searchable directories to find and to develop links with relevant people (Hislop 2013:50). In this view, information communication technologies (ICTs) are a cornerstone to facilitate KM practices (Stankosky 2005). Engineering school emphasises on the use of IT systems to provide people with task and process oriented knowledge on operational processes and procedures through codification of knowledge in databases that are available to people (Hislop 2013:50).

Technocratic school views appear to put technology ahead of humans. In this study, the advent of ICTs and the emergence of Web 2.0 tools were used to facilitate the creation and sharing of knowledge within academic libraries. In addition, ICTs enable rapid search, access and retrieval of the information which has been captured and retained, and also support collaboration and communication between organisational members (Hislop 2013; Jain 2007; Singh 2007). The access and use of Web 2.0 tools help library staff to share their knowledge with colleagues and respond more effectively to users' needs (Michael and Maira 2007). Islam, Agarwal, and Ikeda (2014:318) explain that Web 2.0 applications and tools can be leveraged to support knowledge sharing, creation and other knowledge processes.

### **3.4.2.3 Behavioural school**

The behavioural perspective implies to the way humans react within KM environment. In this case, it refers to the way they behave within academic libraries in determining how knowledge is managed. Behavioural school contrasts with the technocratic school as its emphasis is much more on people management practices and process than on managing knowledge via the use of IT systems (Hislop 2013:59). Fundamentally, this school is focused on creating processes, spaces and mechanisms which facilitate the interpersonal sharing of knowledge between people (Hislop 2013:59). According to Lloria (2008), this school has a European focus which puts social interaction and intellectual capital as strategic resources and organisational assets.

The behavioural school is a kind of community of practice model where there are continuous learning and informal information exchange which is enhanced by the availability of knowledge retained and accessible from within as well as outside the organisation (Hislop 2013). Kulkarni, Ravindran and Freeze (2006) suggest that “The community is recognised as a fundamental context for sharing knowledge with trust as its enabler”. Thus, Web 2.0 tools such as Wikis, Blog and RSS Feeds can be used to enhance the flow, access and retrieve of knowledge within academic libraries.

Behavioural school of KM comprises three distinctive sub-schools which are organisational school, spatial school and strategic school (Hislop 2013:59-60). Organisational school of KM is concerned with facilitating the creation of interpersonal networks, or communities of people who have common interests and who can benefit from sharing their knowledge and experience with each other; and thus the success of such effort depends upon people participating in such communities developing a strong sense of identity with them, and also on there being adequate level of trust between people within them to facilitate knowledge sharing (Hislop 2013:59-61).

The spatial school is focusing on the creation of space, both physical and virtual which can provide the opportunity to bring people together and allow them to share knowledge and experiences when they do so (Hislop 2013:61). Habib (2006) explains that academic library can provide both physical space where people can physically visit; and virtual space in which people can communicate, interact and participate by online means (Web 2.0 tools). Strategic school deals with shaping attitude and values which facilitate effective KM behaviour rather than directly shaping knowledge processes (Hislop 2013:60-61). The need to use KM practices facilitated by Web 2.0 tools, discussed in this instance as the commercial, technocratic and behavioural schools are very important since they link both KM practices and technology (Web 2.0 tools) (Hislop 2013).

### **3.4.3 The application of KM practices in academic libraries**

KM is widely recognised as a key factor in academic libraries (Sarrafzadeh 2008). Mavodza and Ngulube (2012) add that KM practices enable an organisation to improve its performance by enabling learning and innovation whilst solving its problems, acknowledging and resolving gaps in its operations, and recognising knowledge (comprising people and information) as an organisational asset which has to be managed through enabling policies and institutional tools. The primary aim of KM practices in academic libraries is to promote relationship in and between libraries; between the library and the user; to strengthen knowledge internetworking and to quicken the knowledge flow. In the knowledge economy era, libraries are entrusted with an important job of carrying out researches on development and application of information resources, construction of virtual libraries, protection of intellectual property rights in the electronic era, etc., and paving the way for knowledge innovation (Rajurkar 2011).

Academic libraries are regarded as knowledge-creating centre and knowledge-based organisations that work together collaboratively to accomplish the organisational goals (Jain 2007; Kim and Abbas 2010; Sinotte 2004). On the other side, KM practices within academic libraries are regarded as a surviving factor between librarians and their libraries to survive to keep pace in this age of knowledge economy (Jain 2007; Sarrafzadeh, Martin, and Hazeri 2010). Further, KM practices act as the survival kit and a strategic tool for academic libraries (Jain 2007). KM practices equip academic libraries with ample services and facilities to satisfy the customer needs and to improve their professional images through creating new roles and responsibilities (Sarrafzadeh 2008). Moreover, KM within academic libraries can reflect the creation of new products and services (Sarrafzadeh 2008).

Maponya (2004) suggests that KM practices aim to draw out the tacit knowledge people possesses. This can be done by codification strategy (Hislop 2013). It was reported that KM has moved away from focusing on the explicit dimensions of knowledge (that is the computational paradigm) to the tacit dimension of knowledge (that is the organic paradigm) (Hazlett, McAdam, and Gallagher 2005). Ardichvili, Page, and Wentling (2003:65) assert that among the ways of helping people to share knowledge and internalise tacit knowledge is to allow the knowledge sharing members talk about their experiences, skills and understandings; therefore to exchange their knowledge in various activities such as in solving specific problems within institutions. Additionally, academic libraries need to establish a culture which fosters knowledge creation and sharing practices.

Academic librarians need to understand the context that the information is required, as well as organising the information (re-packaging) in a manner most useful to the users, at the same time learning from

previous experiences and situations and as a result be able to anticipate user requirements. Understanding of KM practices requires a close look at library policies and strategies, leadership, knowledge creation and knowledge sharing. This knowledge, then, needs to be shared properly and retained for future use even when the creator leaves the organisation or dies. Eventually, a knowledge bank (Branin 2003), or a KR (Jain and Nfila 2006), or portal may be the result.

Most of the academic libraries employed KM practices to improve the flow of information through knowledge acquisition and knowledge sharing practices (Kidwell, Vande Linde, and Johnson (2000). KM practices in academic libraries facilitate information exchange thus improving KM competencies and skills among library staff (Foo, Nalhe, and Mankar 2002). According to Kude, Nalhe, and Mankar (2012:228), KM practices help academic libraries to deal with knowledge creation, acquisition, packaging and application or reuse of knowledge through the following steps:-

- (a) Knowledge collection;
- (b) Organization;
- (c) Data protection and presentation; and
- (d) Dissemination of Knowledge Information.

The KM practices within academic libraries enhance document management, IM, and records management activities (Jain and Nfila 2006). Wen (2005) suggests that the use of KM practices can help in the processes of capturing, collecting, organising, and disseminating information. Thus, it is important for traditional libraries to go through the process of KM instead of rebranding themselves as knowledge practitioners/ centres, as their role sometimes stays the same because it tends to be a name change only (Mavodza 2010).

#### **3.4.4 Benefits of KM practices in academic libraries**

Literature presents a number of benefits and use of applying KM in academic libraries settings (Kidwell, Vande Linde and Johnson 2000; Kude, Nalhe, and Mankar 2012; Jain 2011; Jain 2015; Maponya 2004; Mavodza 2010; Mavodza and Ngulube 2012; Townley 2001). Therefore, the following sub-sections present the benefits and uses of KM in academic libraries:-

##### **3.4.4.1 Create knowledge repositories**

Most of the academic libraries have employing KR to facilitate the storage and usability of institutional knowledge; this is because librarians have been familiar with knowledge repositories (Townley 2001). KR is among the outcome of KM practices. Among the uses of knowledge repositories, are to preserve

scholarly knowledge and to improve scholarly communication. Jain (2011) explains that KR being a part of KM activities must be focusing on one aspect of institutional knowledge which is to store scholarly research outputs of its academia. KR is regarded as one of the components of KMS used to hold explicit knowledge and facilitate access, retrieval and use of such knowledge (Alavi and Leidner 2001).

Rowley (2000) adds that higher learning institutions abound in potential KR from the corporate financial databases, from the marketing department's database of prospective students to the library and collections of documents, and from electronic and print materials owned by individual tutors. These various databases provide access variously to internally generated data about the organisation's operations (such as student records, or catering supply orders), and external published documents and databases, accessed through libraries, bookshops, and the Web and other on-line services. Jain (2013) suggests that KR must fall into the following three categories:-

- (a) Those which include external knowledge, such as competitive intelligence;
- (b) Those that include structured internal knowledge, such as research reports, and product oriented marketing material as techniques and methods; and
- (c) Those that embrace informal, internal or tacit knowledge, such as discussion databases which store ``know how".

#### **3.4.4.2 Identification of knowledge expertise**

Literature indicates that the first step in the process of knowledge expertise identification is to select knowledge which organisations consider as an asset (Jain 2007; Wiig 1993). Wiig (1993) adds that “the first step is to identify knowledge which can be considered as an asset”. Chandra (2005) provides that expertise is situated or can be obtained from individual employees and most of such knowledge is tacit. One of the benefits of KM practices application is to identify, to capture, codify and store individuals’ knowledge for future use.

Among the ways of avoiding the loss of organisational memory is to identify knowledge within the organisations. Mahmood (2003) adds that academic life demands new competencies from employees regarded knowledge expertises which then are considered as the valuable asset. According to Maponya (2004), much knowledge existing in the heads of people and cannot be easily captured. However, these are systems which are used to capture internal knowledge existing among staff (Wen 2006). According to Gandhi (2004), the old information tools like card-files of frequently asked questions were used to capture knowledge from the reference librarians. Wen (2005) suggests that “Library human resources and staff



development should be charged to work closely with managers at all levels to identify staff with valuable tacit knowledge and take every measure to retain such staff'. Thus, the academic libraries need to employ various mechanisms to capture and identify knowledge of their employees (Mostofa and Mezbah-ul-islam 2015:50).

Additionally, Pearson and Saunders (2009:360) identify three steps of capturing knowledge which is: scanning, organising and designing knowledge maps. The emergence of Web 2.0 tools and Social Media tools simplify the process of capturing knowledge within higher learning institutions, for example Facebook and LinkedIn enable bilateral flow of information, collaboration and effective communication among members (Ayiah and Kumah 2011:4; Kim and Abbas 2010:211; Lwoga 2013:289), while RSS Feed is useful for alerting and filtering information (Penzhorn 2013:66; Schneckenberg 2009: 509).

#### **3.4.4.3 Enhance knowledge innovation**

Knowledge innovation is identified by various literature as among the advantages of the application of KM practices in academic libraries (Darroch and McNaughton 2002; Du Plessis 2007; Herkema 2003; Shanhong 2000; White 2001). Herkema (2003) defines innovation as a knowledge process aimed at creating new knowledge geared towards the development of commercial and viable solutions. Herkema (2003) explains that innovation is the adoption of an idea or behaviour that is new to the organisation. According to Shanhong (2000), knowledge innovation management in libraries refers to the management of the production, diffusion and transfer of knowledge as well as of the network systems constructed by related institutions and organisations.

Cavusgil, Calantone, and Zhao (2003), as well as Du Pless (2007), mention three main drivers of the application of KM in the innovation process. The first basic driver for KM's role in innovation in today's business environment is to create, build and maintain competitive advantage through utilisation of knowledge and through collaboration practices. The same argument could also be applied in academic libraries because, in this modern environment, academic libraries need to utilise the knowledge of their staff and their users and thereafter to establish the means on how such knowledge could collaborate. Cavusgil, Calantone and, Zhao (2003) assert that the process is still difficult due to the changing customer needs, extensive competitive pressure, and rapid technological change.

The second driver of the role of KM in innovation explains knowledge as a resource used to reduce complexity in the innovation process, and managing knowledge as the resource will consequently be of significant importance. Innovation is extremely dependent on the availability of knowledge and therefore

the complexity created by the explosion of richness and reach of knowledge has to be recognised and managed (Adams and Lamont 2003; Darroch and McNaughton 2002).

Shani, Sena, and Olin (2003) add that the increase in the amount of knowledge that is readily available to organisations seems to add increased complexity to the design and management of new product development, but this complexity can be addressed by KM and knowledge-intensive units in the organisation that are strategic in nature. Cavusgil, Calantone, and Zhao (2003) agree that KM is a mechanism through which innovation complexity can be addressed. It assists in managing new knowledge created through the innovation process, but also in managing existing knowledge as a resource used as input to the innovation process. Cavusgil, Calantone, and Zhao (2003) are of the opinion that firms that create and use knowledge rapidly and effectively are able to innovate faster and more successfully than those that do not.

The third driver of KM to enhance innovation process is the integration of knowledge both internal and external to the organisation, thus making it more available and accessible. Knowledge integration implies that timely insights can be made available to be drawn at the appropriate juncture for sense making, i.e. knowledge can be exchanged, shared, evolved, refined and made available at the point of need. Knowledge integration via KM platforms, tools and processes must, therefore, facilitate reflection and dialogue to allow personal and organisational learning and innovation. This requires link-ability, adaptability and dynamic representation of business information and knowledge. Without effective information and KM that drives knowledge integration, which in turn underpins innovation, organisations could be underutilising knowledge as an innovation resource (Baddi and Sharif 2003).

#### **3.4.4.4 Managing information overload**

KM practices help to manage information overload within organisations. Most organisations are compiled with a lot of information created daily, and this is very critical in academic institutions. Such information should not be ignored without proper management but needs to be selected, classified, edited and preserved properly. Bishop (2001) adds that the main challenge for the information professional lies in applying competencies used in 'managing information' to the broader picture of 'managing knowledge' and in managing the know-how of organisational members. Further, information explosion is the negative aspect of knowledge creation and sharing within academic libraries; however, with the increased knowledge sharing leads to increased information explosion and hence academic librarians are increasingly challenged to solve this dilemma of information overload (Israel 2010; Saadan 2001).

Saadan (2001) adds that due to the information explosion and overabundance, the main issue is to recognise, locate and utilise this specialised knowledge and critical knowledge which embedded in organisational databases, processes and routines as a distinct factor of production to increase productivity and competitiveness. The application of KM practices in academic libraries solves this problem of information explosion through selecting the right information to the right people at the right time. Therefore, librarians through the application of KM practices need to ensure information received and produced in the academic environment is filtered and provided to allow easy access, retrieve and use such information. According to Israel (2010), KM application practices are used to manage information explosion through the application of technological tools.

### **3.4.5 Knowledge creation and sharing in academic libraries**

KM practices in this study are defined as the process of creating and sharing knowledge through the application of Web 2.0 tools in academic libraries. Becerra-Fernandez, Gonzalez, and Sabherwal (2004) defined the use of KM practices as the process of harnessing the best out of knowledge resources.

There are various types of KM practices such as knowledge acquisition, creation, capture, sharing, transfer, use and application (Alavi and Leidner 2001; Becerra-Fernandez, Gonzalez, and Sabherwal 2004; Bozbura 2007; Branin 2003). However, knowledge creation and sharing were considered in this study because knowledge creation and sharing practices have been, comparatively, given much attention in most of the KM literature (Lee and Choi 2003; Lin 2011). Lin (2011) and Pearson and Saunders (2009) explain that one of the critical goals of KM implementation is to achieve a balance between knowledge creation (exploration) and knowledge sharing (exploitation).

Scholars divided KM into old KM and new KM (Thitithananon, Klaewthanong, and Ratchathani 2007). First, the old KM assumed that knowledge of an organisation already existed within the institution's boundaries so that the intellectual capital of the whole organisation could depend on the knowledge of arriving and departing employees, especially in the form of tacit knowledge. This means, getting the right information to the right people at the right time. Second, the new KM assumes that knowledge of all institutions not only exists within the organisation's boundaries but also such knowledge can be created by adaptive requirements of the organisation to compete with other competitors.

The first generation of KM focuses on knowledge sharing, that is, how to distribute existing organisational knowledge, usually through technology; while the second generation of KM focuses on knowledge creation that is how to satisfy organisational needs for new knowledge, usually through

processes of learning and innovation (Mosoti and Masheka 2010). In this study, both KM practices involved knowledge creation and knowledge sharing practices. Therefore the following section explains knowledge creation and sharing practices.

#### **3.4.5.1 Knowledge creation practices**

Knowledge creation (exploration) involves experimenting, seeking and discovering new knowledge (Pearson and Saunders 2009:357). Knowledge creation is a spiralling process of conversion between tacit and explicit knowledge and *vice versa*, which then lead to the creation of new knowledge (Gottschalk 2005:23; Nonaka and Konno 1998:42). Nonaka and Toyama (2003) defined knowledge creation as a dialectical process in which various contradictions are synthesised through dynamic interactions among individuals, organisations and the environment.

Nonaka and Toyama (2003) believe that knowledge is created through the synthesis of the contradictions between an organisation's internal resources and the environment. Knowledge creation is also described as 'demand-side KM' seeks to enhance a capacity to satisfy 'demands' for new knowledge; while knowledge sharing can also be described as 'supply-side KM' (Firestone and McElroy 2003).

Nonaka and Takeuchi (1995) postulate that knowledge creation is a social process, meaning that knowledge in organisations is predominantly created in the process of interaction among people. The vision of knowledge creation as a social/ interactive process creates an immediate link to the notion of culture. Indeed, if knowledge is created in the process of social interaction (Nonaka and Takeuchi 1995), and if any social interaction is to some extent governed by cultural rules and rituals (Schein 1992), then culture should somehow influence knowledge creation processes. Knowledge creation process is an important process of KM because it focuses on the development of new skills, new products, better ideas and more efficient processes (Maponya 2004:13).

Knowledge creation is typically the outcome of an interactive process that will involve a number of individuals who are brought together in a project team or some other collaborative arrangement (Newell et al. 2002). Interactions such as networking with other libraries, attending library events (workshops, seminars and conferences) and connecting with online communities are highly recommended (Shanhong 2000). That is why, the knowledge of library operations, library users and their needs, library collection, library facilities and technological knowledge needs to be put together. As a result, new knowledge will be created which leads to the improvement and development of service to the users and functioning of the

library. However, this diverse knowledge is rather dispersed across all the library sections and up the library hierarchy.

Academic libraries are perceived as knowledge creation organisations as a system of integrated activities and business processes that work together collaboratively to facilitate accomplishing overall organisational goals (Daneshgar and Parirokh 2007). Academic libraries are also regarded as the treasure house of knowledge to cater for the needs of scholars, scientists, technocrats, researchers, students and others who are in the mainstream of higher education (Guru et al. 2009). On the other hand, librarians are acknowledged as knowledge creators through content management, an organisation of knowledge, and evaluating the validity and reliability of information obtained from unfamiliar sources (Sinotte 2004).

Maponya (2004:6) explains that knowledge can be created within academic institutions through research, teaching, learning and innovation. Academic institutions are, therefore, regarded as knowledge creating and knowledge-based organisations (Kim and Abbas 2010). Increasingly, governments and funding agencies are recognising universities as knowledge industries for creating new knowledge and innovation through their research. Hayes (2004) maintains that “a university can be viewed as a knowledge factory creating new knowledge through research and by educating knowledge workers, both of which are essential for the modern economy”. Maponya (2004) adds that for universities to achieve their institutional mission, that is, education, research and service to the society, they need to be deliberately and explicitly managing the processes associated with the creation of knowledge.

Wickramasinghe (2006:357) adds that the knowledge creation is not only the first step in most of the KM initiatives but also has far-reaching implications on consequent steps in the KM process, thus making knowledge creation an important focus area within KM. Newell et al. (2002) view knowledge creation from an organisational perspective, noting that knowledge can exist as encoded, embedded, embodied, uncultured, and/embraced. Hislop (2013:104) explains that knowledge creation is very important to dynamic contexts as organisations require regularly adapting and developing new products/services.

Becerra-Fernandez, Gonzalez, and Sabherwal (2004) assert that in today’s knowledge economy, it is indeed vital to begin to take a holistic approach to knowledge creation, and thus combine the people-driven and technology driven theories of knowledge creation into an integrative, all-encompassing Meta framework to truly capture the subtle nuances and complexities of knowledge creation. Becerra-Fernandez, Gonzalez, and Sabherwal (2004) provide two significant ways to create knowledge are:-

- (a) Synthesis of new knowledge through socialisation with experts; known as primarily people-dominated perspective; and
- (b) Finding interesting patterns through observation and combination of explicit data; known as primarily technology-driven perspective.

In this study, knowledge creation was considered important due to the fact that academic institutions are mostly participating in activities which lead to the creation of new knowledge, for example, research activities and innovation, teaching and learning. This study believes that the application of Web 2.0 tools could facilitate knowledge creation and encourage people to participate in online discussion, dialogues and other activities.

### **3.4.5.2 Knowledge sharing practices**

Knowledge sharing practice is the critical process in the organisation that wish to use their knowledge as an asset to achieve competitive advantage (King 2011). According to Becerra-Fernandez, Gonzalez, and Sabherwal (2004), knowledge sharing is the process through which explicit and tacit knowledge are communicated to others (between individuals, to the group and across groups).

Cheng, Ho and Lau (2009:2) assert that “Generally, sharing knowledge is about communicating knowledge within a group of people”. The group may consist of members engaged in formal institutions, for example, among friends, colleagues or school mates. Kuhlen (2003) reports that knowledge produced by a single author provides less meaning unless it is communicated, shared and used as a collaborative process, involving multiple authors, knowledge sources and building upon past experiences and research to create new ideas and understanding. Cheng, Ho, and Lau (2009) add two ways of sharing knowledge within organisations which are closed networks sharing (person to person sharing) and open network sharing (sharing through a central open repository).

Cheng, Ho, and Lau (2009:314) point out that open network sharing is widely adopted in organisations for sharing organisational knowledge. Knowledge sharing which is also termed as exploitation of knowledge involves the uses and develops off the available knowledge to create new knowledge (Pearson and Saunders 2009:357). Maponya (2004:16) adds that knowledge sharing is based on the experiences gained internally and externally in the organisation. Main focuses of knowledge sharing include:-

- (a) Individual who can explicate, encode, and communicate knowledge to other individuals, groups, and organizations (King 2011); and

- (b) Teams since they have become so prominent in management thought and practice, and because some of the long-presumed benefits of teams such as “higher labour productivity, a flatter management structure and reduced employee turnover” have been validated (Glassop 2002:227).

Knowledge sharing is an important strategy within the knowledge-based institutions where knowledge production, distribution and application are ingrained. Berry (2014) supports that the old age saying that “Knowledge is Power” need to become “Sharing is Power”. However, there is currently no direct way to measure the outcome of knowledge sharing (Cheng, Ho, and Lau 2009). Academic libraries are, therefore, needed to introduce knowledge sharing mechanism and knowledge sharing culture to facilitate knowledge sharing in their institutions (Maponya 2004:16). Among the advantages of employing knowledge sharing in this study are as follows:-

- (a) Knowledge sharing involves people to contribute and participate in knowledge production which can later be accessed, retrieved and stored for future development of the institution;
- (b) Knowledge needs be transferred from where it is created or stored to where it is needed to be communicated and shared effectively;
- (c) Knowledge sharing makes people be very creative by finding new knowledge to be shared with others;
- (d) Knowledge sharing leads to creation of new knowledge within the organisation; and
- (e) Knowledge sharing builds trust and relationship between employees and employers.

Knowledge sharing, on the other hand, means retrieving knowledge from the KR and making it available and accessible to users. Tacit knowledge is shared through interaction among people working together in an organisation while explicit knowledge can be shared through databases, expert systems, knowledge bases, knowledge warehouses and the like (Tripathy, Patra, and Pani 2007). This study, employed knowledge sharing because knowledge sharing is among the very critical issues within the academic institutions. Hislop (2013:27), as well as Sohail and Daud (2009:126), explain that academic institutions need to facilitate the academic community to create, communicate, blend and share knowledge. Knowledge sharing has been identified as the most critical area for KM because it provides a link between knowledge workers (where knowledge resides) and institutions (where knowledge attains its competitive value) (Du, Ai and Ren 2007).

Jain (2014) adds that knowledge sharing is the key to KM because it allows knowledge exchange among colleagues and enables informed and participative decision making. Knowledge sharing also involves

gathering and disseminating of internal as well as external knowledge within the organisation (Jain 2014). On the other side, knowledge sharing is considered as the most prominent challenge because it is very difficult to get and encourage people to share their knowledge (Gupta 2008:186). According to Hislop (2013:138), employees (library staff) participating in sharing knowledge activities, need to be intrinsically rewarded. There are many benefits of sharing knowledge at the group level (such as enhanced team or organisational performance), material rewards (such as a pay bonus or a promotion), and/or recognition whereas a person's status as an expert becomes enhanced.

#### **3.4.6 KM enablers for the application of KM practices**

The intention of KM practices implementation should come from the organisational members to be willing to participate in KM practices (Choi, Poon, and Davis 2008). KM enablers are considered as pre-conditions for a successful KM practices implementation ( DeLong and Fahey 1997; Razi and Karim 2011; Zack 1999). Management support, organisational structure, corporate culture, information technology, people, and strategies are some of the advantages of KM enablers within the organisation (Davenport 1997; Zack 1999).

Ichijo, Krough, and Nonaka (1998) add that KM enablers are the building blocks in the improvement of the effectiveness of the activities for KM. There are different terms proposed by various authors which can be used to symbolise these factors. For example, knowledge infrastructure capabilities (Gold, Malhotra and Segars 2001); KM enablers (Lee and Choi 2003) and KM infrastructure Becerra-Fernandez, Gonzalez, and Sabherwal (2004). Jain (2013) adds that organisational knowledge development can be supported by the implementation of appropriate KM enablers such as organisational procedures, culture and technological infrastructures.

The application of KM practices in academic libraries depends on the availability of different types of KM enablers implemented by their parent institutions. In other words, KM enablers for effective KM practices implementations are highly supported and implemented by the parent institutions whereas in academic libraries are parent institutions, and for academic libraries, the parent institutions are universities where such academic libraries belong. Holt, Bartczak, and Clark (2007) explain that the availability of KM enablers shows that organisation is ready for KM practices implementation to some extent.

Lee and Lee (2007) add that KM enablers provide a good environment for organisations' members to implement KM practices. This study regarded KM enablers as factors which could be employed within



academic libraries to enhance the proper implementation and application of KM practices. Therefore, as put in the previous sub-sections, the proposed KM enablers in this study include trust, competencies and skills, information technology infrastructure, incentives and rewards, management support and good leadership and organisational structure.

Further, Zhou, and Fink (2003) reported that organisational culture, structure and information technologies (ICTs) can play an important role in creating an organisational environment conducive for KM practices. Erwee, Skadiang, and Roxas (2012:90), as well as Levy (2009:130), recommend that to maximise KM practices, the organisation must balance three important things which are organisational culture, technologies, process, and people. Therefore, this study expected that KM enablers identified could influence the intention of academic library staff to participate in KM practices. The following sub-sections provide various KM enablers as used in this study.

#### **3.4.6.1 Trust**

Trust is among the KM enablers which can facilitate KM practices in academic libraries. Trust is used to facilitate KM practices which include knowledge creation and sharing (Gottschalk 2005:25; Hsu and Lin 2008:68). According to Hsu and Lin (2008:68) knowledge sharing practice helps to build trust, unity and relationships among people. Moreover, competencies based trust allows one to feel confident that a person sought out knows what s/he is talking about and is worth listening to and learning from (Abrams, Cross, and Lesser 2003).

Mládková (2011:253) asserts that trust is a factor that influences people to share their knowledge, especially tacit knowledge. This is because sharing tacit knowledge is very difficult due to the nature of such knowledge. People cannot share tacit knowledge with people who they do not trust. Trust is, therefore, required to stimulate people to share knowledge and to enter into a social knowledge creation and sharing processes (Gottschalk 2005).

#### **3.4.6.2 KM policy and guidelines**

KM policy is regarded among the critical KM enablers used to guide the application of KM practices within the institution. Therefore, most organisations develop KM policies and guidelines to guide the application and implementation of KM practices. Therefore, this study regards KM policy as among the important KM enablers used to facilitate KM within academic libraries. Library staff in collaboration with policy makers and the management in academic libraries need to think about ways of implementing KM policy to make KM expectations clear to the entire community. Some of the KM policy contents include:-

- (a) Rewards/incentives schemes for creating reusable knowledge resources;
- (b) Leveraging/hiring retirees;
- (c) Extending the retirement age of experts;
- (d) Appointment of KM champions in the organisation; and
- (e) Clearly defined KM goals and objectives (Hislop 2013; Knoco 2014).

In addition, organisational policies and practices could be used to influence the application of KM practices especially knowledge sharing (Hislop 2013).

### 3.4.6.3 Competencies and skills

Competencies and skills are needed for people who are dealing with KM practices. In the perspective of academic libraries, there is a need for academic librarians to extend their expertise which requires the transformation from librarian to knowledge manager (Kude, Nalhe and Mankar 2012). The success of academic libraries depends on the capabilities competencies and skills of its staff to serve the needs of the university community more efficiently and effectively. Therefore, in order to be successful in an academic environment, academic libraries need to acquire the combination of skills needed by the information professional in a knowledge-based environment.

Roth (2003:35) explains that basic skills required to enhance KM practices include: the skills to work together, communication and collaboration skills, technical skills, interpersonal skills and professional skills. Chandra (2005) asserts that managing knowledge involves ‘soft’ people skills as well as technical ability. Further, Chandra (2005:248) adds that other skills can be useful in making the knowledge more accessible, including the knowledge of the organisation, customer service orientation and training skills. Koina (2003) proposes knowledge and skills which library employees need to have for effective of KM application in academic libraries as depicted in Table 3.4:4.

Table 3.4:4 Skills and knowledge for KM implementation

Skills we may have	What we may not have
Flexibility, team skills,	Lateral thinking;
Communication skills;	Power to persuade; Capacity to
Ability to assess and evaluate information;	manage, not endure;
Create, record and store information effectively;	Strategic planning ability;
Use information tools effectively;	Marketing capacity;
Train/educate our clients; Client service oriented.	Analyse our roles and identify areas for improvement.

Source: (Koina 2003)

In addition, IT literacy is critical to academic librarians to use the appropriate technology to capture, catalogue and disseminate information and knowledge to the target audience and knowing how to translate that knowledge into a central database for employees of the organisation to access. According to Mavodza (2010), academic librarians need to have enough skills and knowledge to be as relevant to the electronic milieu created by the technological changes as to that of print. The need of skills to support the application of ICT and Web 2.0 tools among librarians was also supported by a study done by Adeyoyin (2006) among university libraries in which he adds that:-

There was a need for knowledge acquisition among the librarians in Nigerian university libraries to be able to offer efficient services in the emerging ICT era and that the ICT literacy among the librarians was low and hands-on practical experience was lacking among the librarians in some cases.

Further, Hawamdeh, and Foo (2001) present a set of competencies and skills which information professionals need to have. Table 3.4:5 presents the competencies and skills for information specialists.

Table 3.4:5 Competencies and skills for information specialists

Tools and technology	<ul style="list-style-type: none"> <li>• Up to date and familiarity with KM &amp; IT tools and developments;</li> <li>• Mastery of in-house information systems; and</li> <li>• Mastery of in-house tools for knowledge capture, dissemination, and sharing.</li> </ul>
Management and leadership	<ul style="list-style-type: none"> <li>• Devise strategies to cope with complex information knowledge requirements;</li> <li>• Develop, maintain, accessible cost-effective information systems;</li> <li>• Motivate and encourage knowledge-sharing; and</li> <li>• Manage external knowledge and bring valuable resources to the organisation and its members.</li> </ul>
Social and communication	<ul style="list-style-type: none"> <li>• Ability to interact and socialise with organisational members as individuals, teams and communities;</li> <li>• Ability to persuade; and</li> <li>• Ability to communicate clearly, both orally and in written form.</li> </ul>
Information skills	<ul style="list-style-type: none"> <li>• Matching information needs with information resources;</li> <li>• Expertise in information sources and content;</li> <li>• Expertise in information-seeking skills;</li> <li>• Ability to identify, evaluate and recommend information sources;</li> <li>• Providing 'best means' of information access; and</li> <li>• Ability to apply information organisation skills to become knowledge integrators of internet and intranet knowledge.</li> </ul>

Strategic thinking and analytical skills	<ul style="list-style-type: none"> <li>• Exhibit and promote systems thinking;</li> <li>• Understand business processes;</li> <li>• Align information needs to business processes and goals;</li> <li>• Ability to think logically;</li> <li>• Create new ways to elicit information and knowledge; and</li> <li>• Create value-adding information services/systems/ products.</li> </ul>
Personal behaviour and attributes	<ul style="list-style-type: none"> <li>• Proactive;</li> <li>• Responsive;</li> <li>• Friendly;</li> <li>• Creative;</li> <li>• Self-confidence;</li> <li>• Sensitive;</li> <li>• Pleasant;</li> <li>• Patient;</li> <li>• Flexible; and</li> <li>• Depth/breadth or specialised subject and background knowledge appropriate to the organisation.</li> </ul>

In addition, Hawamdeh and Foo (2001) explain that:-

In the context of Library 2.0, the emphasis has perhaps shifted more towards the segments of “Tools and Technology” and “Strategic Thinking and Analytical Skills” to be kept up-to-date of KM and IT tools (including Web 2.0 technologies) and the need to continue to create new ways to elicit information and knowledge (e.g. through social networking and collaborative OPACs) and value adding services, systems and products (e.g. through wiki-like collaborative and SMS reference services).

#### **3.4.6.4 Management support and leadership**

Management support and leadership are among KM enablers for the application of KM practices in academic libraries. Literature mentioned the advantages of management support and leadership in the process of knowledge creation and sharing within the institution (Davenport, DeLong, and Beers 1998; Gaffoor and Cloete 2010; Hislop 2013; Mládková 2011; Wong 2005). Management support and leadership are required in all the activities which will help employees to perform their daily duties perfectly. Institutional activities such as the provision of human resources, job design, employees’ commitment to work and good working environment fall under management support and good leadership

within the institutions (Foss, Minbaeva, and Pedersen 2009; Gaffoor and Cloete 2010; Hislop 2013; Mládková 2011).

Wong (2005) suggests that it is critical for the management and leadership to support KM practices within the organisation as their behaviour will influence the likelihood that other employees will engage in KM efforts. Similarly, Davenport, DeLong, and Beers (1998) have found that having management support and KM initiatives will be championed by executives who model knowledge-sharing behaviours themselves which foster an organisational culture employed to enhance KM practices. The authors also found that the most helpful top management support come when top leadership articulated the correlation between KM and the organisation's success, providing adequate resources and explicitly identifying the organisation's most critical knowledge (Davenport, DeLong, and Beers 1998; Wong 2005).

Good management is expected to give the significant contribution towards the development of employees' skills and core competencies as facilitators in informal learning of teamwork and create KM environment when employees are led to implementing their tacit and explicit knowledge to solve their work problems (Davenport, DeLong, and Beers 1998; Wong 2005). According to Philips (1999), communication which is done continuously by the management about how important KM applications are for employees, are the essential factors in developing KM practices within the organisation. Koenig (1998) states that KM development in an organisation needs management support and good leadership which will be the agent of change, where they are also expected to be actively involved in the process of KM for the sake of its success. Additionally, Shirazi, Mortazavi, and Azad (2011) add that whether employees are motivated by self-interest or goal-congruence, they display different behaviours toward work, colleagues and management want, including changes. Therefore, they need to have strong support from top management, but it is possible that during the implementation of KM practice, management encounters resistance from employees (Yeh, Lai, and Ho 2006).

Further, Apostolou, and Mentzas (1999), as well as Davenport, DeLong, and Beers (1997), assert that KM projects need strong support from management to get attention from the employees. Perez (2002) explains that KM is often interpreted by noting all the things and kept them in the database, but actually, not all knowledge can be codified. KM initiatives need support from management and leaders. Therefore, management support and good leadership are significant KM enablers for effective KM practices in academic libraries.

### **3.4.6.5 Information and Communication Technology (ICT) infrastructure**

Information and Communication Technology (ICT) infrastructure is also among the useful KM enablers to facilitate KM practices within academic libraries. ICT infrastructure includes IT and its capabilities (Raven and Prasser 1996; Scott 1998). Technology contributes to KM (Gold, Malhotra, and Segars 2001). IT is widely employed to connect people with reusable codified knowledge, and it facilitates conversations to create new knowledge. ICT allows an organisation to create, share, store, and use knowledge (Leonard-Barton 1995). Therefore, the support of IT is essential for initiating and carrying out KM.

The main information technologies which are relevant to facilitate KM practices include internet, intranet and extranet; storage architectures; database management systems; metadata; information retrieval; information resources sharing; groupware; middleware; on-line analytical processing; multidimensional analysis and data mining. Lin (2007) adds that examples of ICT facilities support include: providing groupware, online databases, intranet and virtual communities. In addition to this, Beckman (1999) explains that ICT application mainly refers to the fundamental building block of ICT that supports and coordinates KM. Examples include database, knowledge platform, performance evaluation management system and integrated performance support system.

Arora (2002) explains that “a good IT infrastructure is not a sufficient condition for the success of KM but a necessary condition for it”. In addition, according to Jain (2007), technology can guarantee the accurate and timely expression and delivery of knowledge in a more efficient way than can be done by people. A capable information technology infrastructure is far from KM itself, technology is vital in enabling and facilitating many KM processes and initiatives within institutions (Alazmi and Zairi 2003; Artail 2006; Davenport, DeLong, and Beers 1998; Wong 2005). In addition, Jain (2007) adds that Information technology infrastructure tools guarantee the accurate and timely expression for the delivery of knowledge in a most efficient way than can be done by people. Therefore, technological tools can be used as a mechanism to help people create, capture, store, exploit and share knowledge.

Hendriks (1999:91) adds that KM practices should be integrated properly, an institution requires a good mechanism and effective tools such as Web 2.0 tools, KMS, IS, Intranet, proper libraries, managed documents or groupware applications. It is also reported that technological tools such as Web 2.0 tools are used to facilitate KM and sharing in two ways: by providing the means to organise, store, retrieve, disseminate and share explicit knowledge and information within and outside organisation and by

connecting people with people through collaborative tools to capture and share tacit knowledge (Jain 2007:385).

ICT applications help to make communication among employees easier without distance and time limitations, therefore knowledge can easily be accessed fast and reach all the organisation members (Yu, Kim and Kim 2004). ICT roles to make communication among employees easier without distance and time limitation, supporting knowledge to be accessed fast and facilitating collaboration among organisation members (Yu, Kim, and Kim 2004). According to Arora (2002), technology can be used as a mechanism to help people create, capture, store, exploit, share and apply knowledge.

Arora (2002) explains that “a good IT infrastructure is not a sufficient condition for the success of KM but a necessary condition for it”. Technology can guarantee the accurate and timely expression and delivery of knowledge, in a more efficient way than can be done by people. Accordingly, Koenig (1996:300) suggests the following views on how the author sees librarianship as bringing to KM as:-

.....a set of tools.....to facilitate the implementation of knowledge management, the extension of librarianship, thus avoiding unnecessary, wasteful, expensive, and above all, time-consuming reinventions of the skills and tools we already have.

Hence, IT enables the rapid search, access and retrieval of information, and can support collaboration and communication between organisational members and inter-organisational.

IT and KM are closely tied together because they both help the propagation of structured knowledge vertically as well as horizontally within the organisation. They also make searching and using knowledge much easier. The goal of many enterprises is to use the advancement in IT so as to conduct KM (Alavi and Leidner 2001).

#### **3.4.6.6 Organisational culture**

In KM perspective, culture is used to support organisation to remove or reduce employees' barrier to perform KM practices (Orr and Persson 2003; Tare 2003). In this case, the culture does not only define what knowledge is valued but also what knowledge must be kept inside the organisation for sustained innovative advantage (Long 1997). Academic organisations need to have their own culture to guide and run all the activities conducted within such organisations. The culture of an organisation has a large concept and can be seen from many views (Akamavi and Kimble 2005). Hughes (1996) explains that the culture of an organisation is 'normative glue' which is conventional and can unify organisation which

then leads to the formulation of the social system which is independent and which consists of strong values, symbols, rituals, and myths.

Gaffoor and Cloete (2010:3) define organisational culture as “The unique combination of values, beliefs and models of behaviour in an organisation”. Being an enabler of knowledge in the organisation, culture is a major determinant of knowledge retention because it influences knowledge sharing. Mustaq and Bokhari (2011) investigate the impact of organisational culture and their findings show that organisational culture and transformational leadership had an influence on knowledge sharing. Therefore, organisations should establish an appropriate culture that encourages people to create and share knowledge within an organisation (Jarvenpaa and Staples 2000).

Currently, a wide range of cultural factors has been identified as conducive to different processes of KM, such as prioritisation of knowledge, critical attitude toward existing knowledge, trust, care, openness, proactiveness, innovativeness, entrepreneurship, warmth, support, risk, reward, and so on (Zheng 2005). For example, De Long and Fahey (2000) established four frameworks regarding the connection between organisational culture and KM practices which include assumptions about what knowledge is important, defines the relationship between the group and individual knowledge, creates a context for social interaction and shape the process by which new knowledge is created.

The organisational culture provides a sense of identity to employees and supplies unwritten guidelines for behaviour. The organisational culture is the most important factor for the successful KM practices (Chase 1997; Davenport, DeLong, and Beers 1998; Gold, Malhotra, and Segars 2001). Organisational culture needs to employ other supportive cultures such as knowledge sharing culture. On the other hand, organisational culture has a connection with KM practices and knowledge sharing practices within the organisation (Azudin, Ismail, and Taherali 2014:144). Al-Alawi, Al-Marzooqi, and Mohammed (2007:25) add that each organisation has its own organisational culture which develops over time to reflect the organisation’s identity. An organisational culture that encourages knowledge sharing and knowledge creation, as well as the knowledge which adds the contribution to the organisation, are very critical to the success of KM practices (Alazmi and Zairi 2003; Davenport, DeLong, and Beers 1998; Wong 2005). Skyrme (1999:184) recommends the following characteristics which need to be employed within an organisation which its organisational culture fosters KM practices:-

- (a) Transparent organisational milieu;
- (b) Empowered workforce;



- (c) Dynamic learning environment;
- (d) Continual quest for novel means of development and innovation;
- (e) Concentrated, transparent and extensive communication;
- (f) Periods of reflection, learning and experimentation;
- (g) Communication and interaction across and within groups; and
- (h) Objectives and performance gauges that are synchronised across the organisation learning towards extensive knowledge sharing among individuals who make up the workforce.

Jones, Cline, and Ryan (2006:412) also explain that organisational culture is regarded as knowledge resources because it provides the context within which organisational members create, acquire, share and manage knowledge, therefore, it influences members' attitude towards KM practices. In this, study the establishment of organisation culture is very important to support knowledge creation and sharing. Therefore, organisational culture is a vital factor to an organisation's ability to create the value through leveraging knowledge assets (Cole-Gomolski 1997; Ruggles 1997).

#### **3.4.6.7 Incentives and rewards**

Incentives and rewards are used in organisations to encourage employees to perform in various activities including the application of KM practices. Rewarding people participating in KM practices is very important. According to Mavodza (2010:84), giving rewards to individuals for contributing to KM practices has been proved to be an effective way of encouraging academic librarians to participate in KM practices. Wen (2005) explains that organisation must introduce different types of incentives and rewards to their employees.

The provision of organisational rewards can range from monetary incentives such as increased salary and bonuses to non-monetary awards such as promotions and job security can facilitate the application of KM practices within the institution (Lin 2007:319). However, a clear reward system can make employees feel co without paying them more money (Pearson and Saunders 2009). On the other hand, scholars discover that incentive program plays a major role in KM practices as well (Alavi and Leidner 2001; Davenport, DeLong and Beers 1998; Schultze and Leidner 2002). The incentive program positively influences the amount of support that the members of the organisation are willing to give for the activities of KM, and also increases their willingness to participate in the creation and sharing of knowledge. In addition to this, Jain (2013) asserts that participants' incentives could be modest honorarium, promotions and opportunities to attend conferences for professional development. In some libraries, incentives were built into the performance evaluation systems and top achievers received a financial bonus.

Rewards systems such as recognition letter, promotion, bonus and training are valued as among the important KM enablers used to motivate people to participate in KM practices. According to Hislop (2013:186), having properly motivated employees can facilitate knowledge sharing and influence the loyalty of such employees to remain working for their organisations. It has also been described that individuals will participate in a virtual community to share or exchange knowledge if the personally perceived benefit outweighs the perceived loss of valuable knowledge (Chang and Chuang 2011).

### **3.4.7 Web 2.0 tools: an overview**

The development of Web 2.0 tools allow the academic libraries to collaborate and communicate with their users online, focus on user participation, and transform the operation of information services and resource sharing. The term “Web 2.0” refers to the second generation development and design of the Web that aims to facilitate online communication, participation, collaboration and sharing of information (Miller 2005; Stephens and Collins 2007). Further, Tim O’Reilly defines Web 2.0 as follows:-

Web 2.0 is the network as platform, spanning all connected devices; Web 2.0 applications are those that the most of the intrinsic advantages of that platform: delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an “architecture of participation,” and going beyond the page metaphor of Web 1.0 to deliver rich users experiences (O’Reilly 2005).

Bebensee, Helms, and Spruit (2011:23) explain that Web 2.0 is the reorientation of the Web that promotes unbounded interaction, collaboration, communication and participation of people which is characterised by the emergence of a large amount of content generated by a collective of Internet users. Web 2.0 was first coined by O’Reilly Media to describe a new way of online communication, participation, collaboration and sharing among people (Mahmood 2007). Web 2.0 refers to internet-based technologies and systems which facilitate interaction between people and whose content is created via user interactions and contributions (Hislop 2013:211). The application of Web 2.0 tools fall under eight principles which are: long tail, data is next Intel Inside, users add value, network effects by defaults, some rights reserved, perpetual beta, cooperate and do not control (Yan, Yang, and Wang 2008:419).

Historically, Web 2.0 is the development of Web 1.0 (Arya and Mishra 2012). Web 1.0 is static and is more of a place to find information; while, Web 2.0 allows the users to collaborate, share information and create networks and scale effects in large communities (Arya and Mishra 2012; Chan 2010; Hislop 2013; Cociolo 2010; Foo and Ng 2008). In addition, the roadblock for Web 2.0 is not the technology, but people who use it (Lincoln 2009:28). Table 3.5:6 presents simple comparisons between Web 1.0 and Web 2.0.

Table 3.4:6 Comparisons between Web 1.0 and Web 2.0

	<b>Web 1.0</b>	<b>Web 2.0</b>
What are its main functions?	An information source	User participation
How is it organised?	Around web pages	Around people
Who are the experts?	Professional provide information	Users provide information
What is its focus?	Publishing information	Users exchanging and sharing information

The application of Web 2.0 tools to libraries is termed as “Library 2.0” (Casey 2006). Library 2.0 was first reported by Michael Casey in his Library Crunch Blog (Casey 2006).

Library 2.0 application refers to a user-centred environment which helps individuals to edit and comment on contents and also facilitate the online communication, collaboration, participation and sharing of information within the library (Casey 2005). Casey and Savastinuk (2006) provide the following:-

The heart of Library 2.0 is user centred change. It is a model for library service that encourages constant and purposeful change, inviting user participation in the creation of both physical and the virtual services they want, supported by consistently evaluating services. It also attempts to reach new users and better serve current ones through improved customer-driven offerings.

Maness (2006) further defined “Library 2.0” as “the application of interactive collaborative, and multimedia web-based technologies to web-based library services and collection.”The emergence of Library 2.0 resulted from the transformation of Library 1. Therefore, the difference between Library 1.0 and Library 2.0 are as presented in Table 3.4.7.

Table 3.4:7 The difference between Library 1.0 and Library 2.0

<b>Library 1.0</b>	<b>Library 2.0</b>
References with traditional means	References with Blogs, IM, RSS and Wikis
Cataloguing	Tagging in OPACs
Online communities via mailing lists	Online communities via social networks
Text-based tutorials	Podcast-based and streaming tutorials with interactive databases
Catalogue of largely reliable print and electronic holdings	Catalogue of reliable and suspect holdings, web-pages, blogs, wiki and so on
Controlled classification schemes	Tagging coupled with controlled schemes

Source: (Xu, Ouyang, and Chu 2009).

### **3.4.8 Access and uses of Web 2.0 tools in academic libraries**

Most of the academic libraries worldwide apply Web 2.0 tools to enhance and improve the quality of library services. Most of the academic libraries created websites to enhance the access and uses of Web 2.0 tools. Hazidah and Mohd Ismail (2013) support that more recently; academic libraries have been applying Web 2.0 on their websites. Chua and Goh (2010) found that the presence of Web 2.0 applications has an influence on its overall quality of library websites. Most of the academic libraries have recognised how different Web 2.0 applications can be used complementary to increase the level of user engagement (Chua and Goh 2010).

Web 2.0 tools are more applicable in academic libraries as compared to other libraries worldwide. This is due to the fact that academic libraries involved in many activities such as teaching, learning, research and innovation (Makori 2012:31; Xu, Ouyang, and Chu 2009:324). Makori (2012:34) asserts that Web 2.0 tools application within academic libraries gives such libraries the opportunity to provide outreach activities, customise online and create innovative services for library users. Thus academic libraries are increasingly adopting Web 2.0 tools to design services that allow them to reach more library users in the virtual space. Library users can be continuously informed about the activities taking place in the library, the events that are occurring, what collections are available and receive selected information about the things they are interested in (Hazidah and Mohd Ismail 2013). This allows library staff to target a segment of users in the population who will never visit the library to use the services (Foo and Ng 2008). Figure 3.4:3 presents the five essentials of Web 2.0 tools in libraries as adopted from (Xu, Ouyang, and Chu 2009).

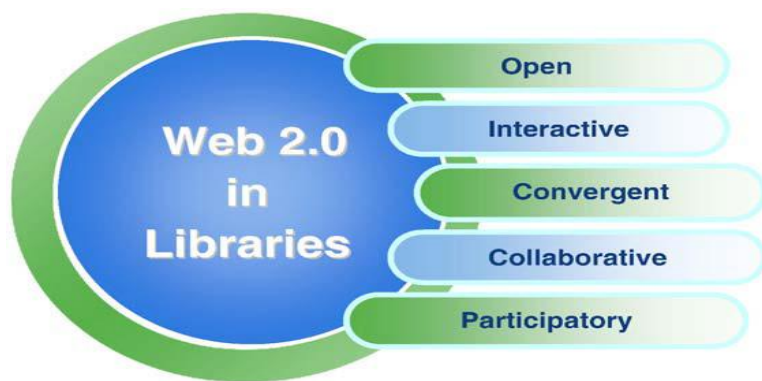


Figure 3.4:3 Five essentials of web 2.0 tools within libraries

The uses and access to Web 2.0 tools offer a wealth of opportunities for the design and delivery of a variety of new resources and services in academic libraries (Penzhorn and Pienaar 2009). There are various uses of such tools in academic libraries as reported by various authors such as: Casey (2006), Kim and Abbas (2010), Lwoga (2013), Lwoga (2014) , Penzhorn (2013), Stephens (2005), Totterman and Widen-Wulff (2009), and Tripathi (2009). Stephens (2005), as well as Tripathi (2009), provide the application of various Web 2.0 tools in the academic libraries as presented in Table 3.4:8.

Table 3.4:8 Application of Web 2.0 tools in academic libraries

Web 2.0 tools	Uses in academic libraries
Instant messaging	<ul style="list-style-type: none"> <li>• Communication</li> <li>• Information on library services</li> <li>• Assistance with resources</li> </ul>
Wiki	<ul style="list-style-type: none"> <li>• Subject related information</li> <li>• Assignment preparation</li> <li>• Resource guides</li> <li>• Training information</li> </ul>
Blogs	<ul style="list-style-type: none"> <li>• Publicise new books</li> <li>• Book reviewer comments</li> <li>• Libraries news and events</li> <li>• Book discussions</li> <li>• Advertising the library</li> <li>• Research tools</li> </ul>
Video Sharing Tools	<ul style="list-style-type: none"> <li>• Promote library services</li> <li>• Library guidelines</li> </ul>
RSS	<ul style="list-style-type: none"> <li>• Library news and events</li> <li>• New books</li> <li>• Newest-journals/newspapers/magazines</li> <li>• New catalogs</li> <li>• Routine catalogue search</li> </ul>
Bookmarking Tools	<ul style="list-style-type: none"> <li>• Searching the library directory</li> <li>• Guidance with resources about library</li> <li>• Book review reports</li> </ul>

Casey (2006) adds that the next version of library catalogue or OPAC will have to include many of the attributes that comprise the definition of Web 2.0 tools which will include the following key requirements: user participation, customization, maximum usability, and greatly enhanced discovery. For example, Hennepin County Public Library has improved their catalogue by giving their customers the ability to write reviews on the items in the catalogue.

Mavodza and Ngulube (2011) also add that among the ways in which library users can use functionalities of Web 2.0 tool is the use of OPAC tagging, so that they can have a set of records of their preference to use, easily accessible in a tag cloud, or have a social network account such as Twitter, Facebook, MySpace or Delicious. The library should also use collaborative and interactive workspaces available, such as Wikis, to find and share knowledge and expertise.

Wikis could also be used to enhance innovative service delivery in most of the academic libraries. In most of the academic libraries, a Wiki-like platform was created for the librarians to work collaboratively and concurrently on providing answers to the users' enquiries. This allows academic librarians tap into the collective wisdom of the communities of subject librarians and provide quality answers to their queries (Foo and Ng 2008). Besides using Wikis as a collaboration tool, some libraries have used Wikis to assist researchers with their research works.

Among the advantage of using the Wikis is to create the research guide is the ability to add and edit content easily and anywhere to keep it updated (Casey 2006). The Wikis also allows librarians to determine which content is used most and this can influence the type of content to focus on (Foo and Ng 2008). Libraries have also used Web 2.0 platform to enhance collection development. For example, the National Library of Australia has used Flickr to expand their collection of pictures on Australia (Foo and Ng 2008).

Social networking sites (SNSs) provide great opportunities for library staff to interact with their users (Foo and Ng 2008; Penzhorn and Pienaar 2009) SNSs can be effectively for outreach and promotion. Libraries are also tapping into social videos such as video blogging and YouTube to create a presence at these sites. These are also being used as marketing tools (Foo and Ng 2008).

In addition, literature provides several advantages of using and accessing Web 2.0 tools within academic libraries which include:-

- (a) To increase libraries' relevance to users;

- (b) To Improve libraries' image (e.g., patrons would notice that the library was up to date with technology);
- (c) To allow rich, interactive, and convenient time so as to improve the level and the quality of the services (e.g., disseminate information via RSS feeds, provide multi-faceted service, and offer more options to serve users);
- (d) To increase users' participation as well as to increase interactions and communication with users;
- (e) To broaden librarians' perspective to obtain users' feedback;
- (f) To draw collective knowledge among librarians to provide good services to their users;
- (g) To improve academic librarians' inter-departmental communication and provide the outcome to their users;
- (h) To facilitate instant problem solving with the benefit of traceable services; and
- (i) To improve online knowledge sharing and collaboration (Kim and Abbas 2010, Nguyen 2008, Lwoga 2013, Lwoga 2014, and Penzhorn 2013).

In information science perspective, Web 2.0 tools divided into the following categories: information acquisition for gathering information from sources external to the library (e.g. Blogs, Wikis); information dissemination for distributing information by libraries to users (e.g. RSS); information organization to facilitate representation of content and subsequent search and retrieval (e.g. social tagging); and information sharing to enable bilateral flow of information between libraries and their users (e.g. instant messaging and social networking services) (Chua and Goh 2010).

### **3.4.9 The application of Web 2.0 tools to enhance KM practices in academic libraries**

Academic libraries are expected to provide timely access to relevant and reliable knowledge. The advent of ICTs and the emergence of Web 2.0 tools have always played a prominent role to enhance KM practices (Hislop 2013; Levy 2009). The emergence of Web 2.0 tools creates more opportunities for KM practices. By the late of the 2000s, one of the most ways that ICTs were being argued as facilitating KM initiatives was via the application and use of web 2.0 tools (Hislop 2013; Levy 2009). Thus, in considering ICTs as a tool to facilitate KM practices, the focus here is on web 2.0 tools. Web 2.0 tools such as Blogs, Academia.edu, Wikis, WhatsApp, Facebook, Twitter and e-mail, knowledge can be easily transferred, discussed and shared among people (Chigada 2014).

Jashapara (2005) defines KM in the light of emerging technologies as “the effective learning process associated with exploring, exploitation and sharing of human knowledge that use the appropriate

technology and cultural environments to enhance an organisation's intellectual capital and performance". Further, Hosseini and Hashempour (2012:139) define Web 2.0 tools in relation to KM practices as "Web 2.0 has reinvented the concept of KM towards the vision of facilitating interaction, cooperation and knowledge exchange between individuals, groups and communities". The strides that Web 2.0 tools have made so far provides opportunities to mark in the sand for the collaboration between Web 2.0 tools and KM practices (Tise and Raju 2013).

KM practices require the use of sophisticated technology including collaboration and communication tools (Web 2.0 tools) which helps in content creation (user generated content), connecting people (social networking) and many other forms (Linh 2008; Mavodza 2010; Stephens and Collins 2007). The views of Web 2.0 in KM practices are mainly focusing on human creation as human collaborative knowledge (Kim and Abbas 2010; Totterman and Widen-Wulff 2009). Jain (2013) explains that the Web 2.0 has transformed the entire landscape of KM and sharing, unfortunately, many libraries are still not exploiting the benefits of web development. Additionally, application of Web 2.0 tools within academic libraries facilitates online collaboration, communication, participation, creativity and knowledge sharing (Chua and Goh 2010; Kim and Abbas 2010; Luo 2009).

Levy (2009) mentions the reasons which Web 2.0 tools should be used to enrich KM practices:-

- (a) Because they have their special emphasis;
- (b) Because people will be expecting to find them and use them in the organisations; and
- (c) Because they hear and smell new and successful, and if this is not the only reason to be using them, it cannot harm knowledge management, vice versa.

Hislop (2013:202) explains that much of organisational knowledge could be codified, stored in and distributed via the proper use of Web 2.0 tools. Yang (2008:345) adds that Web 2.0 technology is a primary means of developing knowledge capabilities whereby people can easily create and share knowledge. Web 2.0 technology is an extremely powerful tool for assisting the organisational flow of information and knowledge, and most KM efforts are focused on the implementation of this technology (Chua and Goh 2010; Kim and Abbas 2010; Luo 2009).

Yeh, Lai, and Ho (2006) provides that to ensure the success of KM practices, it is critical that KM enabling technologies need to be integrated to enable the flow of information, effectively utilise the institutional resources, reduce the use of manpower, material, and time, and still be able to achieve



improved output and expected results. In addition to that Kude, Nalhe, and Mankar (2012:228) add that the combination of computers, databases, and telecommunications, especially the Internet provide academic libraries with an incredible number of facilitating KM practices by:-

- (a) Reduced service costs;
- (b) Save the time of users as well as staff;
- (c) Quality and quantity improvement; and
- (d) Improved user services.

Literature presents a number of advantages of ICTs and Web 2.0 tools to facilitate KM practices as follows:-

- (a) To produce ‘expertise maps’, allowing people looking for help to identify others with relevant knowledge and expertise, which is where the concept of transactive memory system is relevant;
- (b) To facilitate rich forms of communication and collaboration between people who are physically/geographically dispersed, which is where the use of Web 2.0 technologies is examined;
- (c) To create a virtual community of practice, which research evidence suggests has been widespread, also presents a means of developing and encouraging rich forms of communication and knowledge sharing;
- (d) To allow people to establish and develop contacts with strangers who have relevant knowledge which would have been difficult to achieve by any other means; and
- (e) To codify knowledge and that once codified it can be transferred and shared between people via ICTs/Web 2.0 tools (Hislop 2013; Kude et al. 2012).

Web 2.0 principles are overlapping within the characteristics of KM practices and could be applied to reshape the KM practices (Bebensee et al. 2011). Table 3.4.9 presents the comparison between Web 2.0 tools and KM practices as adapted from (Levy 2009).

Table 3.4:9 Comparisons between Web 2.0 tools and KM

SN	Web 2.0 principle	KM matching principle
1	The Web as a platform	Knowledge as Technology: The KM world is based on four complementary components: culture, process, technology and content in which none is independent. According (Davenport & Prusak 2000) in their book, Working Knowledge, emphasise this principle: ‘‘It is important to keep in mind their (technology- m.l.) limitations . . . effective KM cannot take place without extensive behavioural, cultural and organisational change’’ They state that if an organisation invests more than third of a KM project in technology, it stops being a KM project and turns into an IT project.
2	Service development	WEB services, is the most popular way for sharing data and information, context related, in portal window-lets and in the portal professional desktop. In the KM world, ones do not care (for ideological reasons) where the information is stored, rather how it is used by us in various knowledge applications. The portal is a broker, via which services present the data, information and knowledge.
3	Active participation of users	Active participation of users. KM deals with sharing the knowledge and preserving it. The knowledge is based on users, and without them, such activities cannot take place; therefore, active participation of users is a necessity. Nevertheless, in KM, the users’ participation is encouraged by a central team usually convincing people to add content; in many cases, they will even settle with users only using knowledge (built by several key users). Sharing is controlled. In some cases, content added is moderated before published. In Web 2.0, by comparison, activities are decentralised and people add voluntarily.
4	The service improves automatically, the more it is used	KM is based on the collective knowledge of its users. Nonaka and Takeuchi in their book, The Knowledge Creating Company, described the success of the Japanese companies in developing knowledge, based on the Japanese sharing culture which builds the collective organisational new knowledge (Nonaka & Takeuchi 1995). A major difference between the two has to do with dealing with the LONG TAIL concept. Web 2.0 sanctifies it, KM ignores it. KM solutions are based, in many cases, on a mass of 20 percent of the users (content experts), contributing 80 percent of the knowledge.
5	Collective intelligence (the long tail)	KM is based on the collective knowledge of its users. Nonaka and Takeuchi in their book, The Knowledge Creating Company, described the success of the Japanese companies in developing knowledge, based on the Japanese sharing culture which builds the collective organisational new knowledge (Nonaka & Takeuchi 1995). A major difference between the two has to do with dealing with the Long Tail concept. Web 2.0 sanctifies it, KM ignores it. KM solutions are based, in many cases, on a mass of 20 percent of the users (content experts),

		contributing 80 percent of the knowledge.
6	Content as the core	Content is one of the four components on which KM stands: culture, processes, technology and content. It does not stand for itself, yet it is part of the core, and no KM solution can take place without a rich content segment. A decade ago, when KM was initiated, it was not yet understood that content drives KM. Books and articles written in the 1990s did not emphasise on content. Over time the importance of content was recognised. Organising content, filtering and processing it, became a central issue, bringing search engines and navigation issues to front stage.
7	The perpetual beta	At first glance the concept of perpetual beta may seem irrelevant to KM. KM does not deal with technology, but KM uses technology. Working with a perpetual beta can serve KM a great deal. One of the KM challenges has to do with understanding this potential. Organisations can design communities of practice, portals and knowledge sites with care and thought, yet only after launch and use, do people realise what more can be added in. Potential is learnt via use. Changes are required frequently, adjusting the technology to the people using it as they and their needs mature. The perpetual beta is certainly a great enabler.
8	Rich user experience development via small modules	Irrelevant to KM.

The comparison seems useful in this study because it presents on how Web 2.0 tools can be adopted to enhance KM practices. As reported by Levy (2009:132), something is changing, Web 2.0 bring new light that should be adopted in KM practices. Levy (2009:132) thus adds that Web 2.0 tools should be used enriching KM tools for the following reasons:-

- (a) Because they have special emphasis, for example Wiki (structured content pages), Blog (personal diary, including access to the diary, including access to the diary as a whole which enables fast access to new pages, with easy access to history), RSS (alerts regarding new content items and changes among existing ones, by categories), Tagging-Folksonomy (everyone can subjectively tag his or her own information) and social computing (building social communities over the net);
- (b) Because people will be expecting to find them and use them in the organisations; and
- (c) Because they hear and smell new and successful, and if this is not the only reasons to be using them, it cannot harm KM, vice versa.

Bebensee, Helms, and Spruit (2011) add that Web 2.0 principles overlap with the characteristics of KM and therefore they could be applied to reshape KM practices. The application of Web 2.0 tools in this study has the potential to improve the creation and sharing of knowledge in the academic libraries.

#### **3.4.10 Categorises of Web 2.0 tools to enhance KM practices**

Generally, there are various categories of Web 2.0 tools as follows: social networking sites (Facebook, MySpace, Google+ etc); professional networks (LinkedIn, Academia, Xing etc); researcher networks (Research Gate, The Science network, Library:-Library20, Webjunction etc) and microblogging sites (Twitter), authoring tools (Blogs, Wikis, content management system and content sharing), sharing sites (Slideshare, Google Docs, Dropbox etc), productivity applications (Really Simple Syndication/ Rich Site (RSS) Feeds), Online/social bookmarking (Google Bookmarks, Delicious, CiteULike and Stumble upon), video and audio videos upload, sharing and management tools (YouTube, PhotoBucket and Metacafe), audio sharing (Podcast), image sharing (Picasa, Flickr and Photobucket), audio sharing (Vodcast) and tagging. Therefore, the following sub-sections present different types of Web 2.0 tools which are essential to enhance KM practices.

##### **3.4.10.1 Authoring tools**

###### ***Wiki***

Wiki is a collaborative and communication space which provides freedom, ease of use and access, simple and uniform navigational conventions and is also a way to organise knowledge (Grace 2009:65; Parker and Chao 2007:57). The Wiki provides links and references to other websites that are related to various subjects to help users to better understand the context and therefore, to easily add and edit information (Grace 2009:65; Murugesan 2007:35). Wiki is deployed academic libraries to build internal knowledge databases or a user centre, or as librarians' communication platform; to help and to encourage users to contribute resources. Wiki can also facilitate knowledge sharing, collaborative authoring, and online discussion within the academic environment (Kim and Abbas 2010).

Levy (2009:125) explains that Wiki includes the ability to create engines which enable easy creation of links between terms, pages and titles, enlarging in another dimension of knowledge management. Grace (2009:69) suggests that users can easily add their suggestions and articles on the wiki and allow other users to read, edit and link to other relevant resources. People use Wiki for collaborating and sharing ideas, organising documents and resources from individuals and in groups, and also to support committees, working parties and university projects (Grosseck 2009:479; Kumar 2009:106). Thus, a Wiki is regarded among the useful Web 2.0 tools to enhance KM practices by providing a good place for people to create new knowledge and sharing knowledge easily (Wagner 2004:270). In creating new

knowledge, people can easily put up their suggestions and articles in the Wiki and allow other users to read, edit and link to other relevant resources (Grace 2009:69).

Thus, the Wiki is regarded as an important Web 2.0 tool to enhance KM practices because wiki enables users to establish or identify the specific set of knowledge needs and tracking knowledge sources needed (Wagner 2004:274). In addition, Wagner (2004) adds specific characteristics which make wiki an important tool to enhance KM practices as follows:-

- (a) Wiki combines multiple sets of knowledge gracefully whereby individuals are able, and even encouraged, to create knowledge content that is incomplete and then invite other collaborators to add content;
- (b) Wiki creates joint ownership of the work product whereby each person can add to each other's pages and can make changes. Wiki can also enable a community to share its knowledge freely in which community members can help each other in correcting mistakes and work as a high-performance team. In addition, the "Power of N" also plays an important role as a safety and reliability feature. For any individual who attempts to maliciously alter or remove Wiki content, there are many others who quickly repair the damage (using, for instance, the Wiki's rollback mechanisms);
- (c) Wiki supports a decentralised group of conversationalists, but the technology infrastructure is designed to be centralised. Wikis use a common repository, i.e., database server, an application server that runs the Wiki software, and a web server that serves the pages and facilitates the web-based interaction. Wikis are thus available anytime and anyplace where there is web connectivity, and have a single common KR. As a result, they enable and empower multiple users to collaborate whenever and wherever on the same, centrally stored, knowledge product, able to see and use the entire work product;
- (d) The basic unit of information in a Wiki is a web page. This property, in itself, is an advantage over other conversational media such as discussion forums, where the same concept may be discussed within multiple postings belonging to one or more threads, or where one message may shift the topic focus elsewhere, thus covering more than one knowledge concept in one message. In a Wiki, if there is a mismatch between knowledge concepts and Wiki pages, it can be adjusted, either by breaking the content into multiple pages or by combining multiple pages into one;
- (e) Since each concept is specific to one web page, its URL is unique, and, therefore, can be indexed and searched. As a result, knowledge concepts can be catalogued individually and found easily

even by search engines incapable of full-text search. This advantage loses some of its importance when content is spidered and indexed by quasi-full text search engines such as Google;

- (f) Hyperlinks connect concepts to other concepts, thereby creating context. Aside from the obvious advantage of allowing readers to make connections and to drill down into detail knowledge, hyperlinks are also a potential quality assurance mechanism and relevance indicator. Pages with many links to them indicate a highly useful page. Furthermore, the context identified by a page's hyperlinks (and hyperlinks pointing to it) help define the meaning of a page to a search engine; and
- (g) In a Wiki, the work product, the knowledge content in its iteratively improved form, is the focus of attention. This focus differs from other conversational technologies.

Wiki's capability to bring together the input of multiple participants (Power of N) which addresses knowledge user needs' leading to more and better knowledge. Its characteristics enable other uses than simply conversational knowledge creation (Wagner 2004:278). Furthermore, Wikis in principle do not involve restrictions on editing rights, thus enabling anyone to modify anyone else's knowledge. While this privilege arguably creates the potential for knowledge vandalism, the corrective powers of a large ownership, combined with the ease of rolling back earlier Wiki versions make Wikis relatively robust (Wagner 2004:282).

### ***Blog***

The Blog is a personal web page kept by the author in a reverse chronological diary form (Kim and Abbas 2010:213). It is a central focus for discussion forums among people (Hislop 2013:217). It is used to enhance knowledge transfer and flow which leads to the creation of new knowledge (Yu, Lu, and Liu 2010:33). Chai and Kim (2010:408) add that Blog is currently gaining attention as useful knowledge sharing platforms for KM practices in a collaborative work environment (Chai and Kim 2010:408). Functions such as permanent links, trackback, RSS Feeds and comments enable Blog users to be interactive and to participate in the information and knowledge generation (Chai and Kim 2010:408; Nelson 2008:136).

Blog enable discussions, ensure clarification, and make users to follow-up information among users (Virkus 2008:265). The Blog is a very useful tool within the academic libraries for updating library users on their areas of interest and also to provide information on new Internet sources (Akeriwa, Penzhorn and Holmner 2014). Thus Blog was adopted in this study as among the Web 2.0 tools to enhance KM

practices in academic libraries. Academic libraries can easily establish a Blog purposely for KM activities.

#### **3.4.10.2 Social Networking Sites (SNSs)**

SNSs contain Web 2.0 tools which facilitate communication, chatting and sharing of ideas among people. According to Boyd and Ellison (2008:210), social networking sites are defined as “Web-based services that allow individual to:-

- (a) Construct a public or semi-public profile within a bounded system;
- (b) Articulate a list of other users with whom they share a connection; and
- (c) View and transverse their list of connections and those made by others within the system.”

Moreover, SNSs provide a way to get and stay in touch with the friends, family and associates (Mahmood and Richardson 2011:370). SNSs such as Facebook, Google+, Research Gate and MySpace are very important Web 2.0 tools to enhance KM practices through providing a place when people can easily communicate and share knowledge (Lwoga 2013:291). For example, Facebook is a social utility that provides users the ability to personalise profiles with photos and information and to communicate more efficiently (Ayu and Abrizah 2011:239-240). Charnigo and Barnett-Ellis (2007) explain that Facebook is among the SNS that allows people to connect with the friends, classmates, lectures and all others members of the site to share knowledge easily.

Most of the academic libraries employed Facebook as the main online collaboration tool and also a major means of communication among academic librarian and library users. Facebook within the library can be used to provide services, marketing, promote, branding and outreach to library users (Charnigo and Barnett-Ellis 2007). In this study Facebook was regarded as a useful tool for creating different groups based on specialities and then invite users to join the main library Facebook and to join specific groups to enhance sharing, collaborating and communicating knowledge based on their specialities and to familiarise with other members taking the same subjects/specialities (Charnigo and Barnett-Ellis 2007; Hosseini and Hashempour 2012; Levy 2009). Facebook is a useful tool which to facilitate scholarly communication and help users to create communities of practice within the academic environment (Maness 2006).

### **3.4.10.3 Productivity applications**

#### ***RSS Feed***

Really Simple Syndication/Rich Site Syndication (RSS) feed is a family of web feed formats which is used to publish frequently updated works (Grosbeck 2009:479; Murugesan 2007: 35). RSS Feed contains an XML file which summarises information items and links to the information sources, therefore informs users of the updates (Murugesan 2007:35). According to Akeriwa, Penzhorn, and Holmner (2014:3) RSS Feed is an excellent tool for obtaining information on a regular basis from news services, and can be employed within academic libraries to disseminate library news, for library announcements, the exhibition of new and already existing acquisitions, as well as for reference services so as to enhance knowledge sharing practices.

RSS Feed is the format for delivering regularly changing web content and publishers syndicate (distribute) to their web content (Murugesan 2007:35). Kim and Abbas (2010:214) add that library users can subscribe to academic publishers' digital libraries that offer an RSS feed for each journal and reporting summaries of each new issue as it becomes available; thereby staying current with emerging knowledge in the field. RSS feed is thus regarded as a useful Web 2.0 to enhance KM practices through information flow and dissemination within the academic libraries, whereby RSS Feeds users can be kept informed of the changes made to the web content including Blogs and Podcasts without having to revisit the website (Chua and Goh 2010:204). This can help people to have updated information which they can use to create new knowledge and to share with other people.

#### **3.4.10.3.1 Tagging**

Tagging is a very important Web 2.0 tool to enhance KM practices within academic libraries. Tagging or categorizing is a way to organise information, store the selected articles under the chosen category and also users can be able to provide a note that will remind them about the content of an article, so they can easily locate the information, trace their memory, and remember the content of the article (Kim and Abbas 2010:213). Tagging appears to be a Web 2.0 application with great potential within academic institutions although only a small number of the libraries are currently employed tagging Grosbeck (2009:479). According to Chua and Goh (2010:204), social tagging service supports information organisation (the representation of content to facilitate subsequent search and retrieval) by allowing users to annotate websites using freely assigned keywords known as tags so that these websites can be easily accessed in the future. Kim and Abbas (2010:213) add that the combination of shared knowledge in the form of tags results in a Folksonomies or any other set of terms that can be used within the university to



describe various resources. Tagging facilities allow users to “index” what they are viewing with words or phrases of their choices which are known as tags or bookmarks.

#### **3.4.10.3.2 Social bookmarking sites**

Social bookmarking sites are also used to support KM practices within academic institutions (Gray, Thompson and Clerehan 2008:113). According to Redden (2010:219), social bookmarking helps users to identify and label web pages for later use; and also to organise and share online resources. Hideo and Shinichi (2007) describe how communication data generated from Web 2.0 applications such as social networking platforms can be used to create new knowledge. Social bookmarking enhances KM practices by creating a set of resources which can be used to conduct research and shared by many members within an organisation (Grosseck 2009:479). Social bookmarking is used to link users to free bookmarking sites online and also presents many opportunities for networking with other persons or scholars with similar interests for them to share knowledge easily (Akeriwa, Penzhorn, and Holmner 2014:3).

Social bookmarking sites are useful to enhance KM practices because can provide the capability to organise and share their tags as well as providing the capability to access those tags from any computer with Internet access (Grosseck 2009:479; Redden 2010:219). The user can be able to assign his/her own keywords or “tags” and annotations (such as reviews) and may be able to add comments on other people's bookmarked resources as well (Gray, Thompson, and Clerehan 2008:113). Social bookmarking help to create a set of resources that can be accessed on any computer connected to the internet; conduct research and share that research with peers, track author and book updates.

Social bookmarking allows users to store, organise, search, manage, and share web page bookmarks through a list of favourites or bookmarked sites (Click and Petit 2010:141). Social bookmarking can be used to track author and book updates, for example, share one del.icio.us account for a number of different subject specialities within the universities (Grosseck 2009:479). Examples of social bookmarking tools are Delicious and Citeulike. Del.icio.us enables users to share web resources; while Flickr enables the sharing of pictures. CiteULike is a web service which allows online collaboration among users especially on sharing and saving citation among users within an academic community. CiteULike can also allow bookmarking of useful academic sites (Arya and Mishra 2012:35).

Redden (2010:220) mentions other purposes of using CiteULike which include: organising and categorising web pages for efficient retrieval; keeping tagged paged accessible from any networked computer; sharing needed or desired resources with other users; integrating of new social software tools

and Mashups to access tagged pages with RSS Feeds, cell phones and PDAs. Redden (2010:220) asserts that CiteULike is used to increase mobility hence allows library staff to follow library users' progress and therefore giving them another way to collaborate with each other and make collective discoveries. Social bookmarking can also be used to facilitate interaction and professional development among academic librarians and faculty (Redden 2010:220).

#### **3.4.10.3.3 Video and photo sharing sites**

Video and photo sharing sites such as YouTube and Podcast are very important to enhance KM practices among users through videos or photos. A podcast is often stored in the MP3 format, which provides users access to sound files or music recordings on demand and once the podcasts have been published to the Internet, users can download them to their MP3 players (Kim and Abbas 2010:214). Podcasts are mainly used to improve searching skills, provide guidance in locating resources, and instruction in how to use library facilities (Tripathi and Kumar 2010:2012). According to Grosseck (2009:479), photo/slide sharing is used to inspire writing and creativity, create a presentation using the photos and use tags to find photos of areas and events around the world whereas video sharing sites can inspire video professional development on own terms, create an own subject specific videos and find videos on current issues.

Most of the academic institutions are using YouTube and Apple iTunes for sharing audio and video clips mainly for tutorials (Mahmood and Richardson 2011:371). The Podcast is the least adopted web 2.0 tool by the academic libraries in our sample because only two of them implemented podcasts at their websites (Xu, Ouyang, and Chu 2009:328). Further, a podcast is often stored in MP3 format hence provides users access to sound for recordings of various information to be shared (Kim and Abbas 2010:214). The Podcast is now popularly used by libraries for book talk. Another prevalent use of podcast is storytelling. For example, the Denver Public library offers podcasts of share nursery rhymes, fairy tales and children stories as recorded by the librarians (Foo and Ng 2008:6). Some libraries have also used the podcast to provide library instructions and information literacy programmes (Foo and Ng 2008:6).

#### **3.4.10.3.4 Microblogging sites**

##### ***Twitter***

Microblogging is a broadcast medium that exists in the form of blogging. Some micro-blogging services offer features such as privacy, settings which allow users to control who can read their microblogs or alternative ways of publishing entries besides the web-based interface also a useful tool to support KM practices (Kim and Abbas 2010; Mahmood and Richardson 2011). A good example of Microblogging is Twitter. Twitter is more applicable within the academic libraries context to facilitate KM practices (Lamshed, Berry, and Armstrong 2002:9; Ram et al. 2010:70). Twitter allows users to share information

including their thoughts with everyone (Kim and Abbas 2010:214). Mahmood and Richardson (2011:369) add that about 85% of libraries in the United States are using Twitter for Microblogging.

#### **3.4.11 The role of the academic libraries to support the application of Web 2.0 tools to enhance KM practices**

Academic libraries play major roles in supporting the applications to enhance KM practices such as knowledge creation and sharing activities. Academic libraries are service centres in which academic librarians are service providers, who have the needed knowledge and skills to facilitate teaching, learning, research, and innovation within higher learning institutions (Maponya 2004:6).

Academic libraries can work in close relationship to collaborate, communicate, share and disseminate knowledge within organisations. Through KM practices academic libraries have an opportunity to collaborate with other units to increase both their effectiveness and that of academic institutions (Townley 2001:46). Moreover, academic librarians in KM environment need to manage the relationships with internal and external providers and seekers of knowledge to enhance knowledge flow, transfer and sharing within the organisation (Kude, Nalhe, and Mankar 2012:8).

Akeriwa, Penzhorn, and Holmner (2014:4) explain that the role of the academic library is to support the academic activities of the staff and students of its university as a whole, providing services geared towards their research and scholarship needs for them to participate in knowledge sharing practices. Chandra (2005:251) mentions the following strategies which could be implemented to facilitate the application of Web 2.0 tools to enhance KM practices in academic libraries:-

- (a) To network with people across the organisation through the application of Web 2.0 tools as it was explained that 'networking' is the very powerful enabler for proper knowledge sharing practices. It enables one to gather and share relevant information/knowledge and to build trust and relationship among users. It can also connect people to one another and help in publishing information quickly and easily;
- (b) To use superior communication skills to facilitate and involve collaborative environments, to identify tacit knowledge that could be made explicit and to encourage people to identify and publish relevant ideas and observations for distributions;
- (c) To enable explicit knowledge to be shared 'virtually' throughout the organisations by utilisation of social media tools and to apply metadata and other IM techniques and principles for improved accessibility to relevant content;

- (d) To exercise traditional ‘management’ skills such as leadership, motivation and influencing skills as well as the change management and project management skills so necessary in constantly changing environment today;
- (e) To create links between disparate but connected bits of information and knowledge across the organisation;
- (f) To integrate separate document management, library and other databases into a single KMS;
- (g) To have a thorough understanding of the organisation’s business, its function flows, strategic plans, people and processes; and
- (h) To have a thorough understanding of the theoretical underpinning of knowledge use, transfer and management.

When well utilised the academic librarians can also participate in strategic planning and decision making activities so as to ensure attentive information gathering and processing to develop an intimate understanding of how information is usually used within academic institutions. Library staff needs to provide training, advice and consultation to users about the selection of information search strategies and evaluation of the information. Moreover, academic librarians need to conduct information literacy training in their libraries to enhance their library users the ability to locate, identify, retrieve and use the needed information at the right time and the right format.

Bruce (2004) adds that one of the most frequently cited descriptions of an information literate person are someone who is able to ‘recognise when information is needed, and have the ability to locate, evaluate and effectively use the needed information’; a definition developed by the American Library Association in 1989. Therefore, academic librarians need to emphasise on information literacy programmes and instructions on the effective use of technology and user needs (Mavodza 2010). Based on the changing working environment academic librarians need to do the following:-

- (a) Work closely with library users;
- (b) Shape information policies and procedure manuals, structure, processes and systems that will nurture organisational teaching and learning, research and innovation;
- (c) Extract, filter and disseminate vital external information and knowledge for competitive intelligence;
- (d) Design and develop workgroup application which is effectively platforms (here are Web 2.0 tools) for information sharing and information management;
- (e) Work side by side with subject experts in collecting and analysing strategic intelligence; and

- (f) Act as trainers and consultants to transfer information gathering and research skills throughout the organisation (Chandra 2005).

Academic librarians help users to improve their research work, enhance their scholarly communication and social scholarship to enhance KM activities. Furthermore, academic libraries need to support the creation and sharing of knowledge within academic institutions through teaching, learning, research and innovation. Academic institutions are concerned with the conservation of knowledge and ideas; teaching, research, publication, extension and services and interpretation (Maponya 2004). Academic libraries need to utilise modern technologies (Web 2.0 tools and social media tools) to increase stakeholders' awareness, improve library service qualities, subscribe to specialised databases and library resources, to market and promote library services.

### **3.5 Challenges which hinder the application of Web 2.0 tools to enhance KM practices in academic libraries**

Literature presents a number of challenges which hinder the application of Web 2.0 tools to enhance KM practices in academic libraries. Some of the challenges brought by the advent of ICTs and emergence of Web 2.0 tools in academic libraries; while other brought by KM practices implementation. According to Emmanuel and Sife (2008), ICTs have brought positive revolution, but it may bring new challenges that must be minimised to increase effectiveness and efficiency of libraries in developing countries. Therefore, the challenges that hinder the application of Web 2.0 tools to enhance KM practices in this section are divided into three parts as presented below:-

#### **3.5.1 Organisational challenges**

According to Sohail and Daud (2009:131), organisational challenges are challenges that are not derived from the individual personally and they can be environmental or caused by another individual. Organisational challenges in this study comprise the following challenges:-

##### ***Inadequate infrastructure and resources***

Inadequate infrastructure and resources including lack of hardware and software, lack of good premises and environment, unreliable power supply, lack of internet connectivity, low bandwidth and the like. Makori (2012) reported the low rate of internet penetration; low bandwidth, and unreliable power supply which are among the main factors which hinder the application of web 2.0 tools to enhance KM practices within academic libraries.

Emmanuel and Sife (2008) explain that low bandwidth is a critical problem to many universities not only in the Africa but also in the United States of America (USA). Emmanuel and Sife (2008) also insist that the effect of low bandwidth is felt more in libraries than in other department/section within a university. Internet connection is also a problem in most of the academic libraries especially those in developing countries as compared to developed countries. MDG (2011) add that:-

Nevertheless, internet penetration levels in the developing world remain relatively low, at 21 % by end-2010, compared to 72 % in the developed regions.

Lwoga (2012) reports that poor infrastructure includes low internet bandwidth, lack of technical support and the high cost of internet connectivity were the major barriers. Lwoga (2012) also adds that one university in Tanzania is required to pay not less than 104 million Tanzanian Shillings per year which is very expensive for most universities to afford. Makori (2012) reports the low rates of internet penetration and unreliable power supply are the main factors which hinder the utilisation of social media tools to enhance knowledge sharing practices within academic institutions. Makori (2012) also found that internet connectivity in higher learning in Africa is inadequate, expensive and poorly managed.

Further, lack of reliable power supply is among the critical technological challenges facing most of higher learning institutions in Tanzania. Similar findings were also reported by the studies done by Muneja and Abungu (2012) which have reported that only 10% of Tanzanian population is connected to the national grid electricity. Lwoga (2012) also reports on power rationing since 2006 in the country which poses a great challenge to higher learning institutions in Tanzania in the implementation and utilisation of social media tools to enhance knowledge sharing practices.

### ***Financial instability***

Most of the academic libraries worldwide are facing the problem of insufficient funds to run various activities within their libraries. Financial support is very important for the application of KM practices and installation of ICTs and Web 2.0 tools. It is also believed that most of ICTs facilities are very expensive. However, it was reported that most of Web 2.0 tools are the free/open source but still financial supports is needed for installation and customization (Mosha, Holmner, and Penzhorn 2015). Other activities such as training to users and staff, salaries and motivation for staff are also very expensive. Emmanuel and Sife (2008:138) recommends that most of the facilities hence libraries require sufficient funds to acquire modern ICT facilities.

### ***Policies and guidelines***

Most of the academic libraries lack formal policies and guidelines to support the implementation and application of web 2.0 tools to enhance KM practices (Collis and Moonen 2008:104, Grace 2009:71). Both Web 2.0 tools and KM policies are very important to guide the application of Web 2.0 tools to enhance KM practices.

### ***Lack of management support***

Lack of management support to facilitate the application of Web 2.0 tools to enhance KM practices was also reported to be among the challenges that hinder the application of Web 2.0 tools to enhance KM practices. Paroutis and Al Saleh (2009:53) report that lack of support and recognition from management hinders the application of Web 2.0 tools to enhance KM practices in the majority of academic libraries worldwide.

### ***Insufficient training***

Most of the library staff has either very limited or no skills and/or practical experience on using ICTs and Web 2.0 tools to improve the quality of libraries' services which is caused by lack or insufficient training to support the application of Web 2.0 tools to enhance KM practices. Musoke (2008) adds that:

Insufficient training and lack of appropriate infrastructure tend to limit the extent to which even the most innovative librarian can go. These areas require additional support to provide efficient and effective Library and information services to meet the changing needs of users.

In addition, Omekwu (2006) provides the following information based on the lack of knowledge and skills needed to support the application of Web 2.0 tools to improve library services:-

It can, therefore, be concluded that although many professionals are aware of the vital role [that] IT and the internet could play in cultural documentation, dissemination and destabilisation, they do not possess the appropriate skills to assist users in exploiting web-based information. [The truth is,], librarians have not moved with the times. They have not repositioned themselves to make a significant difference in the digital age.

### ***Lack of rewards***

Lack of rewards, recognition and incentives are among the challenges which hinder the application of Web 2.0 tools to enhance KM practices. Wang and Noe (2010:118) add that the lack of incentives

including recognition and rewards have been identified among the major barriers to KM practices especially in sharing knowledge. It was also reported that rewards or incentives could increase people's ability to apply Web 2.0 tools in KM practices (Hosseini and Hashempour 2012:139). Hendriks (1999:91) mentions that incentives such as money or air miles can encourage people to use technological tools (Web 2.0 tools) to enhance KM within organisations. Hosseini and Hashempour (2012:139), as well as Variant and Puspitasari (2013:7), add that motivation such as training, attending seminars and conferences could enhance the application of Web 2.0 tools within academic libraries.

### ***Lack organisational culture***

Lack of organisational culture that hinders the application of Web 2.0 to enhance KM is also among the main challenges. To that Schneckenberg (2009:512) adds the lack of institutional culture that encouraging knowledge workers to share knowledge. According to Ford and Chan (2003:11), organisational culture has been shown to influence the success of KM practices within the organisation.

### **3.5.2 Individual challenges**

Individual challenges are the one derived from individually driven considerations such as beliefs, perceptions, expectations, attitudes, feelings, lack of awareness and unwillingness to apply technology (Cheng, Ho, and Lau 2009:315; Sohail and Daud 2009:131). Paroutis and Al Saleh (2009:56) add that lack of management support in terms of communicating the benefits, providing the necessary training and rewarding and recognising efforts and contributions are among the challenges which hinder the application of Web 2.0 tools to enhance KM practices.

Lack of time, resources and interest in the use of Web 2.0 tools to enhance KM practices are among the most common individual challenges (Grosseck 2009:480). Inadequate knowledge and skills about Web 2.0 tools, their benefits and how to go about using them, unawareness about the value they could provide, and perceptions of certain risks and downsides associated with using Web 2.0 tools are among individual challenges (Grosseck 2009:480; Paroutis and Al Saleh 2009:56).

In addition, librarians' attitude in using and accessing Web 2.0 in their normal duties and to enhance various activities within academic libraries are also identified as among the challenges of not applying Web 2.0 within academic libraries. No-one can be forced to use Web 2.0 tools and it is noticed that some of the library staff can use Web 2.0 tools; while others just refuse to use the tools. The world is changing, and so are libraries.



### **3.5.3 Technological and technical challenges**

Technological and technical challenges have been associated with the installation and application of technology to support the application of Web 2.0 tools including the maintenance and repair of ICT devices. Grosseck (2009:480), as well as Paroutis and Al Saleh (2009:56), add that technological challenges correlate with factors such as the unwillingness to use applications, unrealistic expectations of IS/IT systems, and difficulties in building, integrating and modifying technology-based systems.

Technological and technical challenges are also related to IT resources such as the server, reliable power supply, internet connectivity and computers. Paroutis and Al Saleh (2009:52) assert that Web 2.0 tools have distinct technical features that release a passion for engaging in KM practices and also address drawbacks in the current technologies used within organisations. Lack of knowledge about the tools, their benefits and how to go about using them, unawareness or cynicism about the value they could provide, and perceptions of certain risks and downsides are associated with using Web 2.0 tools (Paroutis and Al Saleh 2009:53). These challenges are associated with poor technological infrastructure and the high cost of internet connection, lack of infrastructure and resources, lack of awareness, lack of training, lack of local expertise, lack of ICT technical support, lack of the time and lack of reliable power supply (Paroutis and Al Saleh 2009:53).

Other significant challenges which hinder the application of Web 2.0 tools to enhance KM practices can also be related to age, technophobia, ICT illiteracy, culture, gender, experience, lack of time, lack of trust of people because they might misuse knowledge and lack of moral support from individuals and from their working places (Riege 2005:23). Grosseck (2009:480) mentioned the lack of experiences, lack of security and privacy as challenges which hinder the application of Web 2.0 tools to enhance KM practices.

### **3.6 Chapter summary**

This chapter has provided the theoretical foundations of the current study and the review of the literature. It was divided into three main sections which were the theoretical foundation of Web 2.0 tools and KM practices; conceptual framework and development of hypotheses; and empirical findings. Various theories and models which guide this study were discussed under theoretical foundations which include Academic Library 2.0 Model, AST, Delone and Mclean IS Success Model, Knowledge Creation Theory, KMS, TRA, and Web 2.0 Driven SECI Model.

The theoretical framework used in this study was adapted from Jennex and Olfman (2003) and then modified to fit this study. Empirical finding in this study based on both KM practices and Web 2.0 tools and application as reviewed from various literature. Most of the findings have indicated on how KM practices can be enhanced in the light of Web 2.0 tools. Literature reviews also showed that academic libraries need to implement KM strategies to facilitate the creation and sharing of knowledge and storage of knowledge for the future use.

KM practices in organisations would be possible if the academic libraries have been focusing on factors that facilitate the utilisation of KM practices in place. The literature review used to find out what methodologies and sampling procedures have been used before, giving insight into how it is possible to come up with a research strategy and to justify the appropriateness of the research strategy for this specific study.

## CHAPTER FOUR

### RESEARCH METHODOLOGY

#### 4.0 Introduction

This chapter provides information on the research methods used in this research. Research methodology is the way of systematically solving the research problem (Kothari 2004:8). Research methodology is also a strategy or plan of action that links methods to outcomes, and govern the choice and use of methods. On the other hand, research methods are techniques and procedures which a researcher proposes to use such as questionnaire, interview and focus group discussion (Creswell 1994; Kombo and Tromp 2006).

Research methodology does not only consider research methods but also encompasses the logic behind the methods used in the research and purposes of using particular methods, hence the research findings can be evaluated either by the researcher or by other researchers (Kothari 2004:8). Specifically, this chapter presents the research methodology of the study focusing on the research paradigms, research design, data collection procedure and instruments, data analysis, validity and reliability, research ethics and evaluation of the research methods.

The research design and methodology of this study are informed by the pragmatic paradigm (Saunders, Lewis and Thornhill 2009). A research paradigm informs the type of methodology a research is based upon. This study employed multi-methods for data collection to inform the problem under study. The use of multi-methods is motivated by the type of questions and the nature of the data desired for this study. Triangulation of methods was achieved in data collection whereby questionnaires (quantitative methods), interviews and observations (qualitative methods) were used as main data collection instruments.

Since the research objectives and research questions of this study were described in Chapter One, this chapter describes the research paradigm, methodology and procedures applied to get answers to the research questions. Therefore the purpose of this chapter is to:-

- (a) Describe the research paradigm and methodology this study subscribes to;
- (b) Expound on the research methods adopted for this study;
- (c) Explain how research instruments were developed and used to collect the data required for this study;
- (d) Data collection techniques; and

- (e) Discuss the data analysis procedures that enabled the conversion of the collected data into information that was used to determine the findings of this study.

#### **4.1 Research paradigm**

Research paradigm is a term derived from the history of science, it was used to describe a cluster of beliefs and dictates what should be studied, how research should be done, and how results should be interpreted (Bryman 2012:714). Creswell (1994) adds that a study must begin with the selection of a topic and a paradigm. Thus, a paradigm is a very important to guide a research work by providing a shared framework which involves common theories, research methods, postulates and data collection methods in which a researcher can easily approach scientific problems.

Paradigm in social sciences is regarded as a set of assumptions about the social world and about what constitute proper techniques and topics for inquiry (Punch 1998:28); helps to understand the phenomena to advance assumptions about the social world on how science should be conducted and what constitutes legitimate problems, solutions and criteria of proof (Kuhn 1970). Research paradigms are also referred to as assumptions (Miller and Brewer 2003), frameworks (Ngulube 2015), worldviews or beliefs (Creswell 2009), and approaches (Neuman 2014).

Positivism and interpretivism are the broad frameworks or paradigms in which the research is conducted (Ngulube 2015). Fraser (2014) adds that paradigms are influenced by realist or objectivist and constructionist ontology. The realist ontology is informed by the positivist paradigm; while constructivist one, or what Neuman (2011) called nominalist, is influenced by interpretivism. Creswell (1994) adds that researchers make claims about what knowledge is (ontology), how we know it (epistemology), what values go into it (axiology), how we write about it (rhetoric) and the processes for studying it (methodology). It is reported that ontological assumptions define the epistemology of knowledge (Ngulube 2015). The knowledge that is generated in the interpretivism paradigm is subjective while epistemologically, positivists generate objective knowledge that is 'out there' (Ngulube 2015).

Therefore, various authors such as (Creswell 2013), Creswell and Plano-Clark (2011), as well as Saunders, Lewis and Thornhill (2009), present five assumptions namely: ontology, epistemology, axiology, methodology and rhetoric as they appear on positivist paradigm, interpretivism paradigm and pragmatism paradigm. The five assumptions are as presented in Table 4:4.1:1.

Table 4:4.1:1 Research paradigm

<b>Assumptions</b>	<b>Question</b>	<b>Positivist paradigm</b>	<b>Interpretivism paradigm</b>	<b>Pragmatism paradigm</b>
<b>Ontology assumption:</b> <i>the researcher's view of the nature of reality or being</i>	What is the nature of reality?	The reality is objective and singular, apart from the researcher. Reality exists independently of human thoughts and beliefs or knowledge of existence (realistic), but is interpreted through social conditioning (critical realist)	Reality is subjective and multiple as seen by participants in a study.	Singular and multiple realities (e.g., researchers test hypotheses and provide multiple perspectives)
<b>Epistemological assumption:</b> <i>the researcher's view regarding what constitute acceptable knowledge</i>	What is the relationship between the researcher and that being researched?	The researcher is independent of that is being researched. Distance and empathy (e.g., researchers objectively collect data on instruments)	Researcher interacts with that is being researched (e.g., researchers visit participants at their sites to collect data)	Practicality (e.g., researchers collect data by “what works” to address research questions)
<b>Axiological assumption:</b> <i>the researcher's view of the role of values in research</i>	What is the role of values?	Value-free and unbiased (e.g., researchers use checks to eliminate bias)	Value loaded and biased (e.g., researchers actively talk about their biases and interpretations)	Multiple stances (e.g., researchers include both biased and unbiased perspective)
<b>Rhetorical assumption</b>	What is the language of	Formal, based on set definitions,	Informal, evolving decisions, personal	Formal or informal (e.g.,

<b>Assumptions</b>	<b>Question</b>	<b>Positivist paradigm</b>	<b>Interpretivism paradigm</b>	<b>Pragmatism paradigm</b>
	research?	impersonal voice, use of accepted quantitative words (e.g., researchers use agreed-on definitions of variables)	voice, accepted qualitative words (e.g., researchers write in a literary, informal style)	researchers may employ both formal and informal styles of writings)
<b>Methodology</b>	What is the process of research?	Quantitative: Deductive process, cause and effect, static design-categories isolated before the study. Context free, generalisations, leading to prediction, explanation and understanding. Accurate and reliable through validity and reliability.	Qualitative: Inductive process, the mutual simultaneous shaping of factors, emerging design categories identified during the research process, context bound, patterns, theories developed for understanding. Accurate and reliable through verification	Combining (e.g., researchers collect both quantitative and qualitative data and mix them)

Pragmatism was developed to provide new options for addressing methodological issues in the social sciences (Morgan 2007). Ngulube (2015) explains that pragmatism or methodological pluralism was born out of an attempt to bridge the gap between interpretivist and positivist epistemologies. It was also reported that methodology is central to the research process which specifies the types of research designs and research methods that may be employed to gain knowledge about a phenomenon (Ngulube 2015). The methodology of positivism is quantitative while that of interpretivism is qualitative (Ngulube 2015). Ngulube (2015) supports that qualitative research is inductive and exploratory in nature while quantitative research is hypothetico-deductive since it is theory-led and tends to be confirmatory.

Sarantakos (2013) suggests that the choice of research methodology is determined by the “underlying theoretical paradigm”, the research purposes and research questions. Research questions determine the methodology that should be used to understand reality while research design or approach determines and controls data collection and analysis procedures (Ngulube 2015). Creswell (2009) contends that many researchers do not always clearly state which particular paradigm guided their research. Babbie (2011) concurs with Creswell (2009) and argues strongly against this non-disclosure because the research paradigm influences the whole research plan. Reasons for non-disclosure could include a lack of understanding, which later lead to the findings being challenged. Babbie (2011) therefore advocates for a better understanding of research paradigms, which will, in the end, allow researchers to justify their choice of research design. Creswell (2009) elaborated that these worldviews are normally shaped according to different disciplines, and they will lead the researcher to favour certain research methods and avoid others.

## **4.2 Key social science research paradigms**

There are three common paradigms in social science research which are positivism, interpretivism and pragmatism (Babbie 2011; Creswell 2009; Neuman 2014). The following sub-sections discuss research paradigms as used in this study.

### **4.2.1 Positivism**

Positivism is acknowledged as the key paradigm that guides quantitative inquiry; it is linked to the natural sciences (Neuman 2014). Neuman (2014) adds that positivism focuses on “discovering causal laws, careful empirical observations and value for free research”. Further Cecez-Kecmanovic and Kennan (2013:121) explain that:-

Positivist researchers generally aim to answer questions about relationships among well-defined concepts with the purpose of explaining, predicting and controlling phenomena. The main reason for research is to discover regularities and causal laws so that people can explain, predict and control events and processes.

Positivism believes that the world is a fixed entity whose mysteries are not beyond human comprehension, thus their findings are always quantitative, statistically significant and generalisable (O’Leary 2004). As a result, findings are quantifiable and communicated numerically. Positivism also reflects a deterministic philosophy which causes and/or probably determine the effect or outcomes (Creswell 1994). Thus, the problems studied by the post-positivists reflect the need to examine the causes that influence outcome such as issues examined in experiments (Creswell 1994).

Positivism is associated with experimental, design, social surveys and questions. These methods are normally used in studies focusing on theory verification, determination, empirical observation and measurements. In this, study questionnaires were used to collect quantitative data. Exploratory Factor Analysis (EFA) was employed to condense a group of empirical indicators to come up with reliable variables which represent research hypotheses and research questions. Further, Knowledge that develops through a positivism lens is based on the careful observations and measurement of the objectives reality that exist “out there” in the world (Creswell 1994). This study has employed SPSS Version 21 and AMOS Version 23 to measure the finding obtained from quantitative data.

There are theories or laws that govern the world, and these need to be tested or verified and refined so that we can understand the world. Thus, in scientific methodology the accepted approach to research by post-positivists is; a researcher begins with a theory, and then collects data and finally test the data to find out if such data supports or refutes the theory. In this study, various theories and models which support this study were employed and then a model was developed which was then tested and lead to the formulation of modified model after data collection and analysis. Hypotheses were also developed to guide the use of the model in this study.

#### **4.2.2 Interpretivism**

Interpretivism attempts to deal with the issue of human complexity by exploring it directly (Polit and Beck 2003:17). Williamson (2013:7) describes interpretivism as an approach that is linked to the neutralistic inquiry. This is the paradigm that guides qualitative inquiry. Neuman (2014) describes interpretivism as:-

The systematic analysis of socially meaningful action through the direct detailed observations of people in natural settings to arrive at understandings and interpretations of how people creates and maintain their social worlds.

Guba and Lincoln (1988) add that individuals in interpretivism approach seek to understand the world in which they live and work. The main goal of a researcher in interpretivism is to rely as much as much as possible on the participants’ views of the situation being studied. Interpretivism also emphasises the inherent complexity of humans and their ability to shape and create their own experiences and the idea that truth is a composite of realities (Polit and Beck 2003:16). Meanings are constructed by human beings as they engage with the world they are interpreting (Creswell 1994). While positivist research focuses on theory verification, interpretivism seeks to generate theory and therefore it is also termed as constructivism (Creswell 2009).



Interpretivist uses open-ended questions to give opportunities for participants to express their opinions, ideas and recommendations towards the study. This study employed open-ended questions to provide a chance for participants to present their opinions towards the study. In addition, Creswell and Miller (1997) state interpretivism places substantial emphasis on how a study makes sense or meaning of a situation.

Creswell (1994) adds that researchers in qualitative studies seek to understand the context or setting of the participants through visiting this context and gathering information personally. This was also applied in this study whereby a researcher visited the field areas physically to collect information from participants who can tell their stories about the problem being studied (epistemological assumption). Further, Creswell (2013:20) suggests that it is important to conduct a study in the 'field' where participants live and work to understand what they are saying.

Interpretivism, on the other hand, is associated with inductive reasoning which begins with particular instances and concludes with general statements or principles (William, Burstein and McKemmish 2000). Creswell (2013:22) adds that procedures of the interpretivism paradigm are characterised as inductive, emerging and shaped by the researcher's experience in collecting and analysing data (methodology assumption). Creswell (2013:22) explains that sometimes the research questions may change in the middle of the study to reflect the types of questions needed to understand the research problem which also may affect the data collection strategy planned before the study.

The use of semi-structured interviews in this study provided a researcher with a chance to discuss with individuals through face to face about the study problem to get in-depth information. The researcher also used semi-structured interviews to be able to add or remove some questions which emerged or seemed not useful during the interviews.

Data analysis follows a path of analysing the data to develop an increasingly detailed knowledge of the topic being studied (Creswell 2013:22). Polit and Beck (2003:17) explain that interpretive studies result in in-depth information that has the potential to clarify varied dimensions of a complicated phenomenon; this is because human beings are used directly as the instrument through which information is gathered. Thus qualitative method was selected in this study to get in-depth information on how Web 2.0 tools could be employed to enhance KM practices within the academic libraries in Tanzania. Inductive processes, emerging design categories and themes which were applied during data collection to verify issues that were not addressed in the quantitative data collection method employed in this study.

### 4.2.3 Pragmatism

Pragmatism is described by Creswell (2009:10) as “the philosophical underpinnings of mixed methods research”. Therefore, mixed methods research paradigm which is termed as pragmatism paradigm was developed after positivism and interpretivism paradigms (Polit and Beck 2003). In support of this, Ngulube (2012) notes in addition to classical categories of research paradigm (positivism and interpretivism) state that about 50 years ago, a third methodological movement (paradigm) and (sometimes called a new paradigm) termed mixed methods research (MMR) emerged.

Pragmatists are in a position which argues that it is possible to work with both positivism and interpretivism positions (Saunders, Lewis and Thornhill 2009:598). Cherryhomes (1992:13) explains that Charles Sanders Peirce’s statement in 1905 was the first declaration of pragmatism. The following is his 1905 statement of it:-

The word pragmatism was invented to express a certain maxim of logic..... The maxim is intended to furnish a method for the analysis of concepts..... The method prescribed in the maxim is to trace out in the imagination the conceivable practical consequences that are, the consequences for deliberate, self-controlled conduct of the affirmation or denial of the concept.

Cherryhomes (1992:13) further elaborates that William James and John Dewey shifted attention to the importance of the consequences of actions based upon particular conceptions. Dewey wrote that “Pragmatism does not insist upon consequent phenomena nor upon the precedents, but upon possibilities of actions” (Cherryhomes 1992:13). Baert (2005:194) reiterates that:-

Cognitive aims of social investigation include the critique of society (which ties in with self-emancipation or the lifting of past restrictions), understanding (which comes down to the attribution of meanings to texts or practices).

Pragmatism offers an epistemological justification (that is via pragmatic epistemic values or standards) and logic (that is, it uses the combination of methods and ideas that help one best frame, address, and provide tentative answers to one’s research questions for mixing the approaches (Johnson, Onwuegbuzie, and Turner 2007:125). The pragmatist worldview focuses on the consequences of research, the primary importance of questions asked rather than the methods and multi-methods of data collections that inform the problems under study. Thus, pragmatism is pluralistic and oriented toward “what works” in practice (Creswell and Plano-Clark 2007; Feilzer 2010). Feilzer (2010:8) adds that pragmatism allows the

researcher to be free of mental and practical constraints imposed by the forced dichotomy between positivism and constructivism.

Pragmatism has been addressed as the foundation of mixed methods which when applied to a research that can yield better outcomes depending on its nature of research (Pansiri 2005:191). There are two major social science paradigms 'positivist/functional' and 'interpretative' approaches to research which have dominated claims regarding their superiority in management of research. Many authors have identified a number of different paradigms which largely depend on this positivist/interpretative dichotomy (Lincoln and Guba 2000). Further, researchers can combine positivist (quantitative) and Interpretivism (qualitative) paradigm to form pragmatism (mixed method research (MMR)). MMR was termed as the third methodological movement (paradigm) which employs two methodologies and two paradigms (worldviews) (Creswell and Plano-Clark 2011; Saunders, Lewis, and Thornhill 2009).

Generally, MMR is an approach to knowledge (theory and practice) that attempts to consider multiple viewpoints, perspectives, positions and standpoints (always including the standpoints of quantitative and qualitative research (Johnson, Onwuegbuzie and Turner 2007:125). Creswell, Fetters and Ivankova (2004:7) offer a definition of MMR as being applicable to a study that:-

Involve the collection or analysis of both quantitative and/or qualitative data in a single study in which data are collected concurrently or sequentially, [both kinds of data] are given a priority, and [interpretations] involve the integration of the data at one or more stages in the process of research.

Pragmatist researchers can use the whole range of quantitative and qualitative (that is descriptive and inferential analytical techniques) analyses in an attempt to fulfil one or more of the five mixed research purposes (triangulation, complementarities, developmental, initiation and expansion) (Johnson, Onwuegbuzie and Turner 2007:125). MMR moves beyond techniques and methods as it encompasses all the phases of the research process including philosophical assumptions and research questions (Teddlie and Tashakkori 2009).

Creswell (2013), as well as Saunders, Lewis, and Thornhill (2009:598), add that pragmatism is a position that it is argued that the most important determinant of the adopted research philosophy is the research question, arguing that it is possible and wise to work within both positivism and interpretivism paradigms

(Saunders, Lewis, and Thornhill 2009:598). This is linked by Romm and Ngulube (2015:158) whose report states that:-

MMR is thus seen as generating a third methodological movement (along with quantitative (QUANT) and qualitative (QUAL) research respectively.

The term 'pragmatism' can also be described as doing what works best. As a result, Creswell (2009:11) states that "pragmatism opens the door to multiple methods, different worldviews and different assumptions, as well as different forms of data collection and analysis". In this case, the main focus is the research problem and how best to get the solution for this problem. When one paradigm cannot sufficiently attain the desired results, the strengths of the two paradigms are combined. Romm and Ngulube (2015:167) explain that:-

Bringing together both quantitative and qualitative research so that the strengths of both approaches are combined leads to a better understanding of the research problem than either alone.

### **4.3 Research methodology**

Research is a systematic reasoning process which is used to confirm the existing knowledge and build new knowledge (Borbas, Jackson, and Langford 2004:75). Research methodology is a way to systematically solve the research problem which helps a researcher to understand the assumptions underlying various techniques including theoretical and philosophical assumptions upon which research is based and the implications of these for the methods and methods adopted (Kothari 2004:8; Saunders, Lewis, and Thornhill 2009:595). Miller and Brewer (2003:192) add that:-

Methodology connotes a set of rules and procedures to guide research and against which its claims can be evaluated a methodology is a form of communication. In order to be able to communicate with others, especially one's peers, one follows certain conventions.

There are two major approaches to research methodology (Bryman 2012; Neuman 2014), namely quantitative and qualitative approaches. This study followed a quantitative approach, which is broadly described as a theory testing approach. Theory testing implies that the researcher starts off with a theory and through deductive reasoning seeks to identify the relationship between this particular theory and the

social reality or research problem that is being investigated (Bryman 2008). Therefore the quantitative approach is the best suited in studies that aim at generating or testing models like the case at hand.

The quantitative approach is a descriptive research which uses formal measures of beliefs, attitudes, intentions and behaviours (Stangor 2011:15). Mwanje (2001:20) adds that:-

Quantitative techniques add precision in measurements; facilitate economy of description, validate statements; and increase accuracy in prediction and objectivity in social research.

This approach emphasises on quantification in the collection and analysis of data in which such data can be expressed in numbers, percentages and tables (Babbie 2010; Borbas, Jackson, and Langford 2004). Variables in quantitative research are measured by using tools or instruments that facilitate the use of statistical techniques to analyse the data that has been collected (Borbas, Jackson, and Langford 2004; Creswell 2009; Kothari 2004). In most cases, quantitative research includes the use of closed survey methods (Myers 1997).

A quantitative approach is also associated with a deductive approach (Babbie 2010:36). Based on the above statements, the quantitative approach was suitable for this study because data collected in this study, a quantitative approach was expressed in numbers, percentage and table; the study also employed statistical software (SPSS Version 21) to analyse quantitative data. In addition, the quantitative approach was employed in this study to explain causal relationships, to permit generalisation, and to enable predictions about the application of Web 2.0 tools to enhance KM practices within academic libraries in Tanzania.

Generally, in the quantitative approach, conclusions are drawn from the selected samples and related or generalised to the population under investigation (Powell and Connaway 2004:59). Other reasons which made this study to employ quantitative research were based on the advantages of its data which include the following:-

- (a) Quantitative approach is easier to analyse and more practical than qualitative studies (Blaxter, Hughes, and Tight 2010);
- (b) Quantitative approach is more formalised (Blaxter, Hughes and Tight 2010);
- (c) Quantitative approach has the possibility of replication by using different groups of subjects (Babbie 2010; Ngulube 2009); and

(d) Quantitative approach cannot study concepts that cannot be numerically measured (Borbas, Jackson and Langford 2004).

The qualitative approach is described as a strategy that emphasises words rather than the quantification in the collection and the analysis of data (Bryman 2012:36). It is regarded as an inductive approach (Bryman 2012:36). In this study, the quantitative approach was employed as the dominant data collection strategy with a small component of the overall study being drawn from the qualitative approach.

The study employed multi-method in which semi-structured questionnaire (quantitative approach), interview and observation (qualitative) were employed to collect data. Multi-method approach involves the use of two or more research methods within a single methodology or worldview in the tradition of methodological triangulation (Denzin 1970). In multi-method strategy, each approach (quantitative/qualitative) were conducted rigorously and completed in itself and then the results triangulated to form a complete whole (Morse 2003). In other words, both quantitative and qualitative data analyses were treated separately and the results of the research were triangulated to form a comprehensive whole (Creswell and Plano-Clark 2007:118).

#### **4.2 Research design and methods**

Once an approach for the study had been selected, the researcher had to choose a research design to ensure that the research study would progress logically. The research design is a programme that guides a researcher in collecting, analysing and interpreting data and giving meaning to it (Ngulube 2009). Bryman (2012:46) describes a research design as a “framework for the collection and analysis of data”. A choice of research design reflects decisions about priority being given to a range of dimensions of the research process.

Babbie and Mouton (2009:74) define a research design as a “plan, or blueprint of how you intend conducting research”. Therefore, the research design clearly outlines the targeted sample, research methods utilised to collect data, research instruments and how the collected data was analysed. De Vaus (200:10) argues that the research design enables the researcher to determine what evidence is required to answer the research question in a convincing way. Logically it contributes to the validity and reliability of the study, as Jupp (2006:266) asserts that “an effective research design will demonstrate that the research will produce valid and credible conclusions that flow logically from the evidence generated”. Figure 4.2:1 was therefore adapted from Cecez-kecmanovic and Kennan (2013) in an attempt to show the methodological choices for this positivist study.

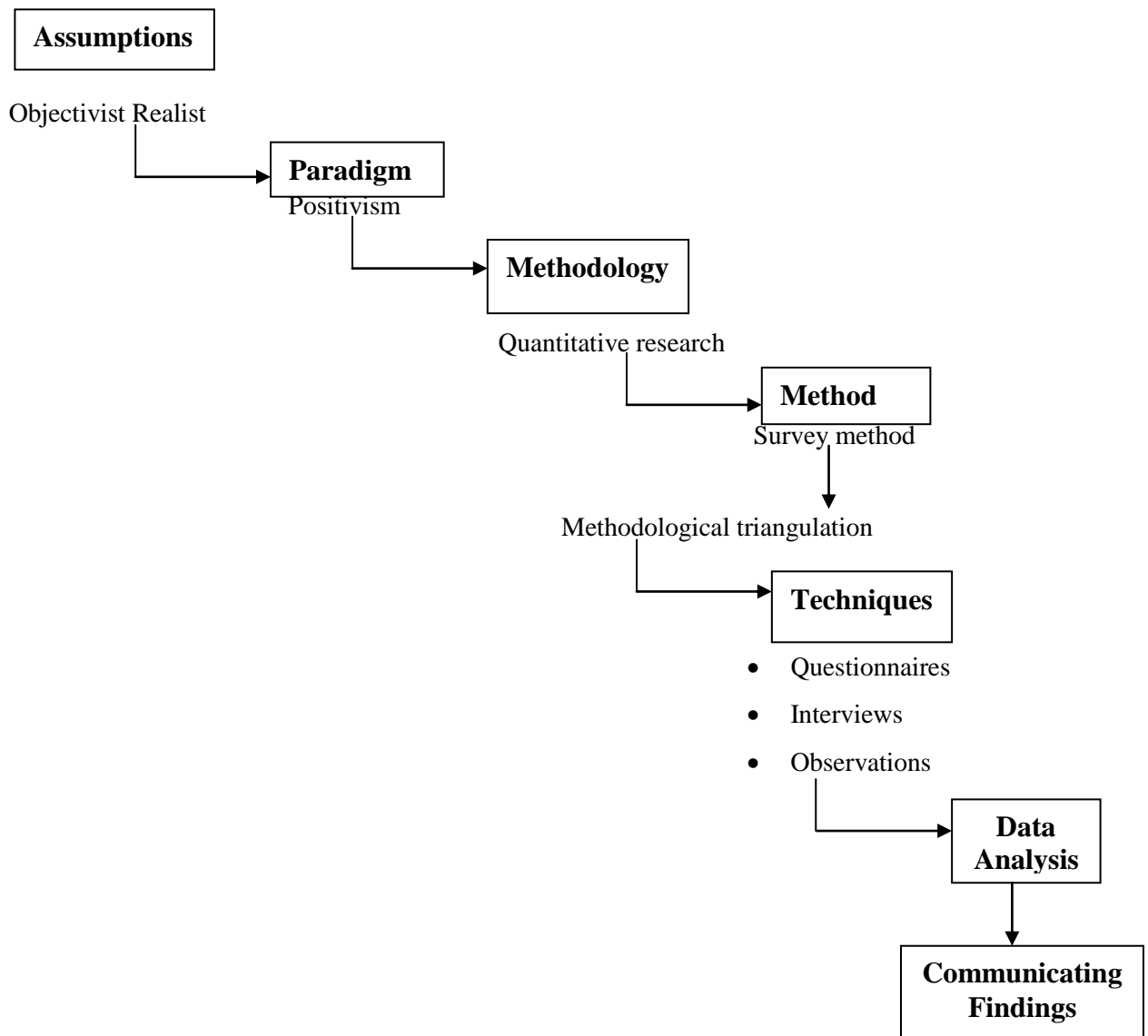


Figure 4.2:1 Research design for the study

There is also a confusion regarding the difference between research design and research method (Ngulube 2015). Creswell (2013), as well as Saunders, Lewis, and Thornhill (2009), use the term “research methods” to refer to techniques and procedures such as questionnaires, interviews, observation and document analysis. Following Creswell (2013), as well as Rule and John (2011,) use the term “research methods” to refer to techniques for gathering data, while research designs as ways of designing and conducting research. Generally, research methods are concerned with data collection techniques such as questionnaires, observations, interviews, document reviews and audio-visual materials.

### **4.3 Study population**

The study population comprises an entire group of people that the researcher desires to learn about (Stangor 2011:110). Population encompasses the total collection of all units of analysis about which the researcher wishes to make specific conclusions (Polit and Beck 2003; Welman, Kruger, and Mitchell 2005). To define the population, a researcher must specify the unit being sampled, the geographical location, and the temporal boundaries of the population (Neuman 2000).

Ngulube (2005) suggests that it is important to define the population of the study prior to collecting data as an appropriate sample size will reflect the population as precisely as possible. The unit of analysis for this study were academic libraries from various regions in Tanzania. Therefore, the library staff from the selected regions participated in this study and made the population of this study.

### **4.4 Sampling**

Babbie and Mouton (2001) define sampling as the process of selecting observations to be included in the study. According Leedy and Ormrod (2010), sampling is done to create a small group from a population that is as similar as possible to the larger population. Leedy and Ormrod (2010) add that it should be a little group that is like the big group, so the degree of resemblance and representativeness is very important.

Ngulube (2005:132) adds that “by studying the sample it is possible to draw valid conclusions about the larger group”. In this study, the population of library staff from public academic libraries which met the selected criteria were considered.

According to Creswell and Plano-Clark (2007), there are two types of sampling techniques which are probability and non-probability sampling techniques. Probability sampling techniques were used to select participants for quantitative data collection; while non-probability sampling techniques were used to select participants for qualitative data collection (Creswell and Plano-Clark 2007; Kombo and Tromp 2006). Some of the probability sampling techniques include random, stratified and cluster sampling and some of the non-probability sampling techniques include purposive, convenience and judgemental sampling (Creswell and Plano-Clark 2007; Kombo and Tromp 2006).



#### **4.4.1 Purposive sampling**

Purposive sampling is a non-probability form of sampling (Bryman 2006:418). In this study, purposive sampling was used to select participants for semi structured interviews (qualitative data collection). The goal of purposive sampling is to sample cases/participants in a strategic way so that those sampled are relevant to the research questions that are being asked.

Kumar (2005) adds that the use of purposive sampling is determined by the judgment of the researcher as to who can provide the best information to achieve the objectives of the study. This assertion by Kumar (2005) was corroborated by Leedy and Ormrod (2010) as well as by O'Sullivan, Rassel and Berner (2008) who all express their view that the use of purposive sampling depends on the researcher's judgment of who to include in a sample. Therefore, the sample of directors, heads of departments and senior staff were selected based on the researcher's knowledge of the population and objectives of the research, as suggested by (Powell 1997).

#### **4.4.2 Sample size**

Sample size refers to the number of items selected from the entire population to constitute a sample (Kothari 2004). The sample size was obtained from the total population to make the generalisation about the whole population (Kothari 2004). The size of the sample used in the study depended on the total number of participants researcher aimed to participate in a study. On the other side, the sample size is determined by how large of a sampling error an investigator is willing to accept, and the variability within the population from which the sample is drawn (O'Sullivan, Rassel, and Berner 2008).

Onwuegbuzie and Collins (2007) add that sample size should be informed by the research objective, research question, and research design. Kumar (2005) reported that the sample size is determined by three factors: the level of confidence the researcher wants to test the results, the degree of accuracy the researcher requires to estimate the population parameters and the estimated level of variation with respect to the main variable being studied. In this case, Creswell and Plano-Clark (2007:113) suggest that:-

If the quantitative research design is an experiment, investigators turn to power analysis formulas; if the study is a survey, sampling error formulas can help identify the appropriate size for the sample.

This study has used statistical power analysis software package known as The Sample Size Calculator of Creative Research System (Creative Research Systems 2003). The confidence level is usually of either

95% or 99%; this states that the probability of including the population mean within the confidence interval (Gray 2004). In this study, a confidence level was 95%. According to Gray (2004). In many studies, a confidence level of 95% is often deemed sufficient. Kothari (2004:155) also adds that:

If we take a confidence level of 95%, then we mean that there are 95 chances in 100 (Or.95 in 1 that the simple results represent the true condition of the population within specified precision range against 5 chances in 100 (or .05 in 1) that it does not.

The sample size for quantitative data is as presented in table 4.4.1.

Table 4.4:1 Sample size for library staff

SN	Academic Library	Population	Sample size	Contingency for non-responses? (10%)	Percentage
1	University of Dar-es-Salaam Library (UDSML)	81	67	74	28
2	Dodoma University (UDOM) Library	50	44	48	17
3	Mzumbe University (MU) Library	45	40	44	16
4	Sokoine University of Agriculture National Library (SNAL)	37	34	36	12
5	Open University of Tanzania (OUT) Library	22	21	22	8
6	Muhimbili University of Health and Allied Sciences (MUHAS) Library	20	19	20	7
7	Ardhi University (ARU) Library	20	19	20	7
8	State University of Zanzibar (SUZA) Library	14	14	14	5
	<b>Total</b>	<b>289</b>	<b>258</b>	<b>278</b>	<b>100</b>

The literature reviewed varies when it comes to defining a particular sample size for use in purposive sampling as follows: According to Onwuegbuzie and Collins (2007), 12 respondents can be included for interviewing. The sample size for qualitative survey ranged from 5 to 12 participants until the study reached the saturation information (that is when the study felt that there was no more new information about a particular study) (Kombo and Tromp 2006). Therefore, in this study, the researcher contended that the range of 6 to 12 respondents.

#### 4.5 Data collection techniques and instruments

Data collection refers to the actual process of gathering and recording data which are guided by the process of administering questionnaires, conducting an interview, presenting a test to individual respondents and recording their responses (Drew, Hardman, and Hosp 2008:53). On the other hand, data

collection technique is the strategies employed to collect data. Data collection technique is determined by the chosen research strategies. Survey strategy employs the administration of the interview and questionnaire, both of which are about getting answers to a set of questions in the data collection process (Kothari 2004). In this study, questionnaire, interview and observations were used as methods for data collection. The questionnaire was used to collect quantitative data; while interview and observation were used to collect qualitative data.

Questionnaire sets were developed and then distributed to all academic libraries and then distributed to respondents (Appendix 2). Interview guides/ protocols were also developed and employed (see Appendix 3) to guide the interviews based on research questions. Some of the interviews were recorded. Observations protocol (see Appendix 4) was developed and was used to guide the observation which was conducted for 40 days of two-hour sessions during the time that interviews and questionnaire data collection were also happening to view the situation from different times of the day and of the week. The events observed were categorised according to the issues raised in the research questions employed in this study.

Due to the fact that the selected academic libraries are geographically dispersed at a great distance, different methods were triangulated. Garaba (2010) adds that the triangulation of quantitative and qualitative methods ensured that the findings are valid and reliable. This study utilised methodological triangulation in the bounds of the survey approach. Therefore, the selected research instruments were a questionnaire, a semi-structured interview guide and observation checklist.

#### **4.5.1 Survey research**

Survey design can be defined as “a scientifically conducted study, or account of a study, in which data is systematically collected from a selected group of sources or informants, usually concerning general conditions, practices, habits, preferences, etc.” (Reitz 2004-2010). Tanner (2013) explains that this type of research involves the “collection of primary data from all or part of a population to determine incidence, distribution and interrelationships of certain variables within the population”. Abbott and McKinney (2013:206) further elaborate that survey research is:-

A non-experimental design that uses a series of written and verbal prompts items to quantify the personal opinions, beliefs and ideas from a group of respondents...the survey instrument (typical a questionnaire or interview schedule) translates order to observe patterns across a group of respondents.

Like any other research method, this type of research has its advantages and disadvantages. Surveys are popular as they allow the collection of large amount of data from the sizeable population in a highly economical way (Powell and Connaway 2004; Saunders, Lewis, and Thornhill 2009).

The survey strategy has been cited as the most reliable way of determining attitudes and knowledge of a particular group through directing interrogation by gathering facts and describing the current situation (Pelizzari 2003). Ndunguru (2007:76) adds that survey research strategy enables researchers “to develop and test theories, establish the cause-effect relationship among a set of phenomena being studied, and assess attributes of a population of subjects under the study.

The survey strategy also allows the generalisation of research results. Other advantages of survey research include cost effectiveness, rapid turnaround time, useful in describing huge populations and flexibility. Further, survey research is among the useful methods and it has been a widely used method in the field of Library and Information Science (LIS) research in the world (Kemoni 2007; Ngulube 2005; Tanner 2000). For example, Ngulube (2005:131) provides that out of 82 theses that were submitted and approved by the University of Natal during the period 1982 to 2002, the survey method accounted for 56 (69.14%) of the methods used. On the other hand, surveys hardly deal with the context of real life, are weak on validity and are not always flexible (Babbie 2011; Creswell 2009).

## **4.5.2 Research instruments**

The selected instruments used in this study were a questionnaire, self-administered interview guide and observation checklist.

### **4.5.2.1 Questionnaire**

The questionnaire is a data collection tool (Powell and Connaway 2004). Saunders, Lewis and Thornhill (2009:361) add that questionnaire is the most widely used data collection instrument within the survey research whereby respondents are asked to respond to the same set of questions. This study employed survey strategy in which questionnaire (see Appendix 2) was used to collect quantitative data. Dewah (2011), as well as Wamundila and Ngulube (2011), explain that most of KM-related case studies used questionnaire and interviews to collect data.

The questionnaire is data collection method/tool which is used to gather information in a wide geographical area; and it is also useful to identify trends or preferences across a large number of people

(Lankshear and Knobel 2004:36). The main reasons for employing questionnaire as a survey tool in this study include:-

- (a) It is an efficient data collection mechanism when the researcher knows exactly what is required and how to measure the variables of interest (Kripanont 2007);
- (b) The questionnaire is considered advantageous for administration of large numbers of individuals simultaneously to facilitate the collection of data in a relatively short period and thus less expensive and less time consuming (Kombo and Tromp 2006; Gray 2004); and
- (c) It is free of bias of the researcher. There is an evidence that different researchers obtain different answers because of different ways of asking questions (Kothari 2004; Gray 2004).

Abbott and McKinney (2013:206) assert that questionnaires are a cost-effective way to conduct research. Other advantages of questionnaire include that the fixed format of the tool which eliminates variation in the questioning process, it encourages open and reliable responses; as well as adequate time for participants to give well thought of their answers (Kothari 2004; Gray 2004). Babbie (2011:294) further explains that questionnaires are useful when it comes to describing phenomena, especially in situations where large population samples are involved.

On the other hand, questionnaire poses some drawbacks as presented by various authors as follows: Powell and Connaway (2004) mention that the absence of explanations to ambiguous questions, as well as a certain degree of non-responsiveness of respondents, might lead to wrong data/information. Further Creswell (1994) explains that responses bias might be caused by low response rate. Despite the drawbacks, some corrective measures were adopted to avoid such problems. The measures included the use of several data collection methods (semi-structured interview and non-participant observation). In addition, questionnaires were pre-tested during pilot study before the main survey as well as the proper design of the questionnaire. Thus, by using the questionnaire, interview and observation in data collection for this study, some of the weaknesses of the questionnaire were minimised.

#### **4.5.2.1.1 Questionnaire design**

Kumar (2005) explains that a well-designed questionnaire should make it easy for respondents to give the necessary information and for the interviewer to record the answer properly. Therefore, a well-designed questionnaire helps a researcher to meet the research objectives (Powell and Connaway 2004). Therefore to design a suitable and reliable questionnaire for data collection, the researcher need to focus on four

aspects of questionnaire design which include: focus, phraseology, sequence and the form of questions (Kothari 2004).

Ndunguru (2007:94) adds that a well-focused questionnaire is the one “whose asked questions cover adequately and in sufficient detail all the various aspects of the research problem”. In other words, the questions asked must be relevant to the research problem. Therefore, to ensure that a well-focused questionnaire was developed, this study used the research objectives, research questions (see Chapter One) and research models (see Chapter Three) to develop a reliable questionnaire design.

The study maintained a proper question sequence to ensure that the relation of one question to another was readily apparent to respondents. Questions that were easiest were put at the beginning to encourage participants to continue with the other questions. Kothari (2004:102) adds that “a proper sequence of questions reduces considerably the chances of individual questions being misunderstood”. In addition, in order to design a suitable and more reliable questionnaire, a researcher needs to consult relevant questions or items from previous studies to adopt as the inputs into the questionnaire design. In this study, some of the questions were developed and validated by other similar studies done by (Chua, Goh and Ang 2012; Jennex and Olfman 2004; Lwoga 2013; Masrek, Jamaludin, and Mukhtar 2010; Wu and Wang 2006).

#### **4.5.2.1.2 Structure of the questionnaire**

The structure of the questionnaire refers to the order and format of questions as used by the researcher. The questionnaire consists a number of questions printed or typed in a definite order on a form or set of forms (Flick 2011; Kothari 2004). The order of the questions must be presented in sequential order and they must have an impact on the accuracy of responses. Powell and Connaway (2004) suggest that questionnaires should start with more general questions, which have the effect of putting the respondent at ease, followed by the more specific ones. Therefore, a researcher needs to put much effort to have questions which respondents can easily answer.

Kothari (2004:102) adds that to make the questionnaire more effective and to ensure quality to the replies received, a researcher should pay attention to the question sequence when preparing the questionnaire. Generally, there are two principal forms of questions which are asked in the questionnaire which are closed-ended questions and open-ended questions (Kothari 2004). The following sections present closed ended and open-ended questions as employed in this study.

### *Closed-ended questions*

Closed-ended questions include questions which provide a number of alternative answers from which respondents were asked to select fixed responses or structured questions (Saunders, Lewis and Thornhill 2009:588). Responses to closed questions can be a single choice, multiple choice or rating scales (Powell 1997; Slater 1990). Questions constructed from closed questions must have two possible answers which are either a “yes” or “no” (Kothari 2004); while the second type is where multiple responses can be selected as required.

Slater (1990) puts emphasis on the fact that the researcher must have a clear definition of the research objectives before being able to ask the appropriate research questions; and these beg for transparency and accuracy in the questions that are used in the questionnaire. It was, therefore, important to construct a closed-ended questionnaire with the use of information from an open-ended one. Therefore, the presented study applied open-ended questions to collect qualitative data (see Appendix 3).

The use of closed-ended questions was to obtain quantitative-based results. Because people’s opinions were sought for, the type of scale used needed to be an effective one, such as the Likert scale (Leedy and Ormrod 2005). The design of the questionnaire as used in this study was based on a Likert scale type of frame, which is useful for measuring attitudes (Powell and Connaway 2004). Likert scale is used to indicate how strongly respondents agree or disagree with a statement (Saunders, Lewis and Thornhill 2009:594); therefore, the Likert scale was employed as an appropriate scale to be used in designing questionnaire used in this study.

Powell and Connaway (2004) the design of the questionnaire can be based on a Likert scale type of frame, because it is useful and more applicable for measuring attitudes (Powell and Connaway 2004). The Likert-type scale is also termed as summated scale, and it is developed by utilising the item analysis approach whereby a particular item is evaluated on the basis of how well it discriminates between those persons whose total score is high and those whose score is low (Kothari 2004).

The main purpose of the Likert scale was to develop “strategies for improvement of a service or intervention, or to formulate policy, eliciting attitudes on various aspects of the issue under study...” (Kumar 2005). Likert scale employed values based on a 5-point scale which rates attitudes such as “strongly agree”, “agree”, “neutral”, “disagree”, “strongly disagree” (Kothari 2004). All the variables were given similar values, and the weights of the choices were equal. This study employed Likert scale

which was based on 5 points scale as proposed by Kothari (2004) which involve the following rates attitudes: “strongly agree”, “agree”, “neutral”, “disagree” and “strongly disagree” (See appendix 1).

### ***Open-ended questions***

Open-ended questions which allow respondents to give answers according to their own words and according to what they think about the particular problem (Saunders, Lewis, and Thornhill 2009:597). This can help a researcher to get in-depth information and a clear picture from respondents concerning the study; thus a researcher can develop more research sub-questions based on the respondents’ views, ideas and opinions about the study (Ellis 2013).

Open-ended questions can also allow participants to use their own words in giving responses and to define and describe a particular situation or an event more precisely (Powel and Snellman 2004:128; Saunders, Lewis, and Thornhill 2009:337). O’Sullivan, Rassel, and Berner (2008) explain that open-ended questions minimise biases because they are accompanied by the list of responses which can initiate, provide rich information and provide detailed comments to help a researcher to identify a range of possible responses. Respondents can also have a chance to elaborate their responses clearly (O’Sullivan, Rassel, and Berner 2008). O’Sullivan, Rassel, and Berner (2008) explain that open-ended questions are important in the first stages of questionnaire design. The present study employed open-ended questions to collect qualitative data.

#### **4.5.2.2 Administering the questionnaire**

Questionnaires were addressed to participants from the selected academic libraries in Tanzania. They were presented physically by researcher/research assistants to the selected academic libraries respondents and then collected after one week. In order to avoid a low response rate, a short and advance notice letter was sent to all members informing them of the survey, significance and value of the research, and the advantages to participate or not to participate in the study (O’Leary 2004).

#### **4.5.2.3 Length of the questionnaires**

Powell (1997) explains that the questionnaire should be as short as possible to encourage complete responses. This assertion is supported by a study in the cabinet-making industry by Galesic and Bosnjak (2009:349) who found that “The longer the stated length, the fewer respondents started and completed the questionnaire”. Adams and Cox (2008:19) add that people’s attention spans mean that long questionnaires are completed less accurately as people rush to finish them. In addition, they go on and explain that long questions make participants avoid reading the questions thoroughly and, as a result, the tendency to give



inaccurate responses is high. In making the questions for the questionnaire items in this study, there was a deliberate avoidance of setting questions that would be unnecessarily long, and the questionnaire itself was short.

#### **4.5.2.4 Questionnaire distribution**

Questionnaires can be distributed by conventional mail, using the postal system, or electronically, using e-mail. Questionnaires can be distributed online, through postal or physical. According to Powell and Connaway (2004), online questionnaires facilitate the faster gathering of data because that data will be relatively easy to collect and analyse in a short space of time; however, it depends on the availability of the Internet to both research and participants.

Further, the postal questionnaire can take a time to reach respondents and they are costly in terms of postage charges and printing costs. However, the postal questionnaire can help a researcher to collect data from a large sample and diverse regions; there is no opportunity for respondents to ask for further information related to answers given (Kombo and Tromp 2006:89). Saunders, Lewis, and Thornhill (2009) mention factors that help to improve the response rate of postal questionnaires which include: having an introduction letter that explains the purpose of the questionnaire as well as emphasising the importance of the respondents. In this study, questionnaires handled physically to respondents and then collected after being filled.

#### **4.5.2.5 Interview**

The interview is a method of collecting qualitative data which involves conversation between people in which one person has a role of the researcher (Gray 2004). The interview is a method of data collection which involves the presentation of oral verbal stimuli which will be applied in terms of verbal responses (Kothari 2004; Saunders, Lewis, and Thornhill 2009). The interview is essentially a qualitative data gathering technique that finds the interviewer directing the interaction and inquiry in a very structured or unstructured manner, depending on the purpose of the interview (Denzin and Lincoln 1994:365). The use of interviews can help a researcher to gather valid and reliable data that are relevant to the research (Saunders, Lewis and Thornhill 2009:318). Interviews are in several forms; however, this study employed semi-structured interviews (Appendix 3).

#### **4.5.2.6 Semi-structured interviews**

Semi-structured interviews are used to collect data in a wide variety of research designs and are mostly associated with the collection of qualitative social data when the researcher is interested in people's experiences, behaviours and understandings (Matthews and Ross 2010:221). In semi-structured

interviews, the interviewer can adjust the questions according to respondent's level of knowledge. However all the respondents can be asked about the same themes, the interviewer may probe some of the questions, including the terminology to fit on the background and educational level of respondents (Welman et al. 2005; Patton 2002).

A researcher can follow certain themes or questions in greater depth and also address any new areas as they emerge during the interview (Glesne and Peshkin 1992:65), however, the order of questions may be varied depending on the flow of conversation and additional questions may be required to explore the research questions and research objectives (Saunders, Lewis, and Thornhill 2009:320).

Semi-structured interviews provide guidance to keep the interviews focused and facilitate cross-case analysis yet also provide room to explore new and relevant issues that emerge during the interview (Carson et al. 2001). This study employed an interview guide which includes a list of questions arranged according to research objectives. Welman et al. (2005:166) assert that an interview guide/protocol used in semi-structured interviews must comprise a list of themes or probe that has contained the research objectives/questions that the interviewer should use during the interview.

The semi-structured interview is more or less a guided conversation than a structured enquiry (Yin 2008). Using the descriptive framework allows for the probe questions to be more direct and effective, and helps the researcher to recognise when something important has been said (Carson et al. 2001). In addition, in semi-structured interviews, additional questions may be required to explore the research questions and objectives given the context or nature of events within a particular organisation. When, for example, a question has already been answered on the previous question, and if the researcher is satisfied with the answer(s) given, the same question might not be asked again.

On the other hand, the interviewer may pose emerging questions which were not listed in the interview guide to explore answers for clarification or to elicit more detail with respect to answers; however, it is recommended that the question needs to be within the scope of the research objectives. Saunders, Lewis and Thornhill (2009:320) report that a researcher can omit, add and edit some of the questions in particular interviews, given a specific organisational context that is encountered in relation to the research topic.

### *Advantages and disadvantages of semi-structured interviews*

A semi-structured interview is very flexible and it is likely to yield information that the researcher had not planned to ask for but which are useful for the study (Bryman 2004:321; Leedy and Ormrod 2005:137). Matthews and Ross (2010:224) mention the following advantages of semi-structured interviews: the use of an informal interview guide will enable the study respondents to talk about their experience in their own way; semi-structured interview format allows the researcher to talk to respondents in-depth and to explore specific issues related to a study, and face-to-face interviews which enable respondents to express their feeling about the research problem.

In addition, respondents need no special skills, and a longer session with more complex questions is possible without misunderstandings because the interviewer is physically present. This physical presence also permits recording of non-verbal signals and spontaneous reactions (Payne and Payne 2004:132) thus, conducting non-participant observation at the same time. The interviews can also be stimulating for respondents and so aid in recall (Fontana and Frey 2005:705).

Semi-structured interviews have several drawbacks. The researcher can receive different information from different respondents during interview sessions and may not be able to make comparisons among respondents; thus results obtained cannot be generalised (Leedy and Ormrod 2005:137). Interviews are costly (money and time) in terms of data compilation, reporting etc; this is due to open-ended questions (Creswell 2003:186; Patton 2002:306; Payne and Payne 2004:132). Despite the author being in control, fieldwork is hard to organise; thus, the researcher cannot know everything that goes on (Payne and Payne 2004:132-133).

Lack of skills and/or language barrier can also inhibit the interviewer for ask questions that evoke long narratives from respondents (Marshall and Rossman 1999:110). The interview's data are also subject to recall error, the reactivity of the interviewee to the interviewer, and self-serving responses (Patton 2002). Further, the respondents can provide indirect information which can mislead the researcher. A researcher's presence may bias responses, and thus people may not be equally articulate and perceptive (Creswell 2003). An interview guide was developed to guide this process. Mason (2002) asserts that an interview guide helps the researcher to align the questions with the objectives of the project.

### **4.5.3 Observation**

Observation is a data collection method which is conducted through watching, and which leads to data collection in a real life and everyday context (Lankshear and Knobel 2004). According to Gray

(2004:379), observation is the process of collecting qualitative data which involves the systematic viewing of people's actions to record, analyse and interpret their behaviours. Teddlie and Tashakkori (2009:219) explain that observation involves the recording of units of interaction occurring in a defined social situation based on visual assessment of that situation. Powell and Connaway (2004:157) state that:-

Observation means to watch attentively in a scientific manner. ...is one of the oldest forms of data collection, but, to qualify as a scientific observation, it should ... be systematic, objective, and free from bias; quantitative whenever possible; and strong in usability, reliability, and validity.

Observation gives a researcher an opportunity to watch and monitor respondents within a natural or structured environment (Johnson and Turner 2003:312). Observation involves the systematic observation, recording, description, analysis and interpretation of people's behaviour (Saunders, Lewis and Thornhill 2009:288). According to Baker (2006:173), the role of observation depends on the problem to be studied, on the insiders' willingness to be studied and on the researcher's prior knowledge of or involvement in the insiders' world.

Generally, observation is more reliable and free from the respondent's bias since data is obtained through observation of events as they normally occur (Sekaran 2003:253). A researcher can record information as it is revealed. Unusual aspects can also be noticed during the observation. Observation can be used to explore topics that may be uncomfortable for respondents to discuss (Creswell 2003). Kumar (2005:120) adds that observation is the best method to study the behaviour than the perceptions of individuals, or when the subjects are so involved in the interaction that they are unable to provide objective information about it. Kombo and Tromp (2006) add that field notes can be taken to record the observed things in the field. Fields notes include basically descriptive notes from the sessions observed, and reflective notes arranged chronologically, followed by a summary and conclusions about activities (Creswell 2007).

Powell and Connaway (2004) list the advantages of observational method which include: the possibility to record behaviour as it occurs; it allows a comparison between what people say and what they actually did; the possibility to observe behaviour or actions that people may not see as relevant or important and the possibility to study subjects who are not able to give verbal reports. Observation has drawbacks such as the researcher may become so emotionally as to lose the ability to assess the situation accurately (Leedy and Ormrod 2005:145). By the researcher's presence, one may alter what people say and do, and what significant events unfold (Creswell 2003; Johnson and Turner 2003; Leedy and Ormrod 2005). In

addition, observation is more expensive than other methods such as questionnaire (Johnson and Turner 2003; Sekaran 2003). Gray (2004) notes that observation allows data to be collected at the time they occur and does not have to rely on the recall of participants or their interpretation of events. However, an observer is not always able to anticipate events; this is because some activities or events are too private of nature to be observed. In addition, quantifying data obtained from observation is not easy.

There are various types of observation as identified by various authors. Saunders, Lewis and Thornhill (2009) mention two types of observation which are participant observation and structured observation. Gray (2004) also mentions two types of observation which are overt and covert observation. Kumar (2005:120) mentions two types of observation which are the participant and non-participant observation. This study has employed a non-participant observation.

#### **4.5.3.1 Non-participant observation**

Non-participant observation occurs whereby a researcher remains a passive observer, watching and listening to various activities and drawing conclusions from the activity (Kumar 2005:120). This study employed non-participant observation, in which role of non-participant observation was adopted. Kothari (2004:96) adds that in doing non-participant observation, the researcher is observing in such a manner that his/her presence may be unknown to people he/she is observing.

Non-participant observation helps a researcher to assist team building by observing activities without taking part in those activities in the same way as the real research subjects (Saunders, Lewis and Thornhill 2009:596). The advantages of non-participant observation include: the observer gains insights about the culture that could not be obtained in any other way (Leedy and Ormrod 2005:137; Johnson and Turner 2003:315); Helps to obtain firsthand experience with participants (Creswell 2003:186; Johnson and Turner 2003:315); and the researcher may discover recurring patterns of behaviour and relationships (Marshall and Rossman 1999:107).

Non-participant observation was employed in this study to observe the following: different KM practices; libraries' websites; activities which leads to the application of KM practices in academic libraries; knowledge sharing activities, Web 2.0 tools availability, The access and use of Web 2.0 tools to enhance library activities, the application of Web 2.0 tools to enhance KM practices (knowledge creation and sharing); and factors that hinder the effective application of Web 2.0 tools to enhance KM practices within academic libraries. The study also used field notes to record observation. According to Bailey (1996:80), field note is the backbone of the collecting and analysing field data.

Each observation session lasted for 60 minutes; this was also suggested in a study conducted in the United States (US) to observe classrooms by (Waxman and Padrón 2004). Therefore, there were 40 sessions at the rate of two hours per day 5 days in each academic library. Observation checklist (Appendix 4) was developed to enhance observation processes to take place.

#### **4.5.4 Triangulation**

Triangulation is the collection of materials by using as many different ways and from as many diverse sources as possible to assist a researcher to understand better a phenomenon by approaching it from several different angles (Kelle 2006). Neuman (2014:166) defines triangulation as a way of learning more about a phenomenon by observing it from multiple perspectives and not just one perspective.

Triangulation enables the collection of multiple data using different strategies, approaches, and methods in such a way that the resulting mixture or combination is likely to result in complementary strengths and non-overlapping weaknesses (Newman 2006; Patton 2002). Thus, by combining methods and investigators in the same study, observers can partially overcome the deficiencies that flow from one investigator or method (Creswell 1994). In addition, triangulation can allow researchers to be more confident of their results and it can also stimulate the creation of inventive methods and new ways of capturing problem to balance with conventional data collection methods (Creswell 2003; Creswell 2013; Gray 2004; Polit and Beck 2003).

Newman (2006) identifies four types of triangulation: triangulation of measures which occurs when researchers take multiple measures of the same phenomenon to see all aspects of it; triangulation of observers which making the use of multiple observers in a study thus adding alternative perspectives to reduce limitations, triangulation of theory occurs when the researcher uses multiple theoretical perspectives in planning the research or interpreting data and triangulation of method which means mixing qualitative and quantitative styles of research and data. Cohen, Manion, and Morrison (2007) outlined six different types of triangulation:-

- (a) Time triangulation employs cross-sectional and longitudinal designs.
- (b) Space triangulation uses comparative or cross-cultural approaches instead of researching one culture.
- (c) Combined levels of triangulation involve more than one level of analysis (individual level, group level and organisational level).

- (d) Theoretical triangulation uses multiple theories to explain research findings.
- (e) Investigator triangulation utilises more than one observer independent of the other.
- (f) Methodological triangulation entails multiple methods.

Triangulation has been used to refer to a variety of approaches employed in multiple methods (Waltz, Strickland and Lenz 2010:458). This multi-method approach is also known as triangulation. The multi-method research was employed in this study to bring together the strength of both data sets to compare, validate, confirm and corroborate quantitative results with qualitative findings (Creswell 2003). Further, the rationale of multi-method research is underpinned by the principles of triangulation, which implies that researchers should seek to ensure that they are not over-reliant on a single research method and should instead employ more than one measurement procedure when investigating a research problem (Bryman 2005); thus, the multi-method research enhances confidence in findings.

On the other hand, this study that used more than one technique of data collection only used methodological triangulation or what Patry (2013) refers to as critical multiplism, which is rooted in 'multi-trait, multi-method matrix'. In other words, this study employed methodological triangulation within the survey method. The dominant approach is quantitative while the qualitative approach served as a less dominant (Schulze 2003).

#### **4.5.4.1 Methodological triangulation**

Methodological triangulation is defined as the use of more than two methods in studying the same phenomenon under investigation (Denzin 1978). Methodological triangulation has been referred to as multi-method, mixed method and methods triangulation (Barbour 1998). Denzin (1970) explain that multi-method approach is the use of two or more research methods within a single methodology or worldview in the tradition of methodological triangulation. Hussein (2009) explains that methodological triangulation has been widely used in social sciences studies.

This study also employed methodological triangulation to obtain reliable data and valid results as well as to bring together the strength of both data sets so as to compare, validate, confirm and corroborate quantitative results and qualitative findings (Creswell 2003). According to Leedy and Ormrod (2005:100), many studies prefer methodological triangulation because it bridges issues of reliability and validity.

There are two types of methodological triangulation which are: between-method type and within-method type of methodological triangulation (Hussein 2009). The between-method triangulation (also known as cross-method triangulation) involves the combination and utilisation of both qualitative and quantitative methods in studying a single phenomenon (Hussein 1985). Hussein (2009) adds that between-method triangulation has been used for the aim of achieving convergent validity and testing degree of external validity. On the other hand, within- method triangulation involves the use of two or more data collection procedures from the same design method, that is qualitative or quantitative (Denzin 1978). Hussein (2009) adds that within-method is the multiple complementary methods within a given single paradigm which are used in data collection and analysis.

This study employed between-method triangulation whereby qualitative data was used to corroborate the findings of the quantitative data. The study employed it because it does not only add credibility of the obtained findings but also provides different perspectives on the same phenomenon as well. According to Denzin (1978), the study findings can be corroborated and any weaknesses in the data can be compensated for by the strengths of other data, thereby increasing the validity and reliability of the results. Thus in this study, data was collected by using questionnaires and then the evidence was corroborated by using interview and observation methods.

#### **4.6 Reliability and validity**

Validity and reliability are of primary concern for data quality control measures in research (Ndunguru 2007:89). Validity and reliability help a researcher to establish the truthfulness, credibility and believability of findings (Gray 2004; Neuman 2006). The following sections explain how validity and reliability were maintained in the present study.

##### **4.6.1 Reliability**

Reliability refers to the extent to which a measure gives consistent and stable results in a measurement process (Ndunguru 2007:89; Sekaran 2003:203). Sekaran (2003) adds that the reliability of measure indicates the extent to which it can occur without bias (error free), and hence ensures consistent measurement across the time and across various items in an instrument. Similar results would be found if the same research was to be repeated or carried out on the similar group of respondents in a similar context or conditions (however defined) (Babbie and Mouton 2001; Gray 2004; Newman 2006; Welman et al. 2005).



The reliability in quantitative approach is a synonym for dependability, consistency and replicability over time, over instruments and over groups of respondents (Cohen, Manion, and Morrison 2007; Leedy and Ormrod 2005). Reliability in quantitative also refers to the extent to which an experiment, test or measurement yields the same result or consistent measurement on repeated trials (Cohen, Manion, and Morrison 2007; Silverman 2006; Welman, Kruger, and Mitchell 2005).

Reliability of measures in quantitative research is achieved in four ways: clearly, conceptualise constructs; use of a precise level of measurement; use of multiple indicators; and use of pilot tests (Newman 2006). On the other hand, reliability in qualitative approach is attained through a range of data sources and use of multiple measurement methods (Newman 2006).

In relation to qualitative research, reliability is concerned with whether alternative researchers would reveal similar information or not (Silverman 2006). Reliability in qualitative approach is addressed in two ways: through the use of standardised methods to write field notes and prepare transcripts, and by comparing the analysis of the same data by several researchers in the case of interviews, and through textual studies (Silverman 2006).

#### **4.6.2 Validity**

Validity is the extent to which the research findings accurately represent what is really happening in the real situation (Leedy and Ormrod 2005; Saunders, Lewis and Thornhill 2009; Welman, Kruger and Mitchell 2005). Validity tests how well an instrument that is developed measures the particular content it is intended to measure (Gray 2004; Leedy and Ormrod 2005). Validity means truthfulness (Newman 2006).

Validity in quantitative research is more concerned with the measurement validity. Measurement validity refers to how well an empirical indicator and the conceptual definition of the construct that the indicator is supposed to measure fit together (Newman 2006:192). Validity in quantitative approach can be minimised through careful sampling, appropriate instrumentation and appropriate statistical treatments of data (Cohen, Manion and Morrison 2007:133).

Scholars proposed various ways to minimise validity in quantitative research (Cohen, Manion and Morrison 2007; Onwuegbuzie and Johnson 2006; Shadish, Cook, and Campbell 2001), for example, Onwuegbuzie (2003) proposed 50 different threats to internal and external validity that might occur at the research design/data collection, and data analysis stages of the quantitative research process. According to

Shadish, Cook, and Campbell (2001) validity is classified into four major steps: statistical conclusion validity, internal validity, constructs validity and eternal validity.

Onwuegbuzie and Leech (2007:233) indicate that “although the importance of validity has long been accepted among quantitative researchers, this concept has been an issue of contention among qualitative researchers”. However, Romm (2014) suggests that it is still meaningful to talk of validity in qualitative research, as long as the term is reworked to do justice to the distinctiveness of what is being offered in qualitative inquiry. Therefore because of the association with the quantitative conceptualization of the research process, the term validity has generally been replaced by the term “trustworthiness” (Onwuegbuzie and Johnson 2006:51) or “validation” within qualitative research (Creswell 2007:207).

Pickard (2007:139) asserts that trustworthiness is very important in qualitative research because it gives a researcher the investigation credibility in terms of problem-solving and solution testing. Therefore to prove trustworthiness, a researcher needs to be familiar with the environment in which the study will be conducted. Trustworthiness or goodness of the qualitative research drew from the natural and experimental sciences for directions (Marshall and Rossman 1999). Marshall and Rossman (1999) put forward alternative constructs used to capture trustworthiness of the qualitative research which includes credibility, dependability, conformability and transferability. The idea of trustworthiness in qualitative approach refers to a great extent on its ability to demonstrate both rigour (in the process of data collection) and the relevance of the outcomes of the study (the quality of the product) (Ellis 2013).

Marshall and Rossman (1999) report that trustworthiness in qualitative research can be achieved through prolonged engagement in the field, persistent observation, shared data and interpretations with participants (member checks), peer debriefing and using multiple theoretical lenses. Therefore, in this study, the researcher conducted semi-structured interviews to study the problem in depth and to share data and interpretations with participants. Various methods which were employed in this stud to ensure validity and reliability of the study findings Included: pre-testing of data collection tools, triangulation, sampling adequacy and saturation, and CFA for measurement model.

#### **4.6.3 Questionnaire, semi-structured interview guide and observation protocol pre-testing**

Pre-testing gives the researcher an opportunity to identify questionnaire or interview guidelines misunderstood by participants and that may inhibit the researcher from obtaining the needed information (Powell and Connaway 2007; Sekaran 2003). The purpose of pre-testing is to increase reliability, validity

and practicability of the instrument (Cohen, Manion, and Morrison 2007; Ngulube 2005; Powell and Connaway 2007).

Pretesting involves the use of a small number of participants to examine the appropriateness of the questions and their comprehension (Sekaran 2003:249). Essentially, it is not necessary that pre-test subjects comprise a representative sample, although the instrument used should at least be relevant to the participants (Babbie and Mouton 2001:244). Ideally, the use of a convenience sample to test a questionnaire is the most utilised approach because of the members' proximity and willingness to participate (Powell and Connaway 2007).

In this study, a questionnaire, a semi-structured interview guide and an observation protocol were prepared according to various guidelines (Cohen, Manion, and Morrison 2007; Bryman 2004; Leedy and Ormrod 2005; Newman 2006; Patton 2002; Welman, Kruger, and Mitchell 2005). The questionnaire, semi-structured interview guide and observation protocol were pretested at Moshi University College (MoCU) in Moshi, Kilimanjaro and NM-AIST in Arusha, Tanzania.

Pre-testing of the questionnaire was conducted between December 2014 and January 2015. Pre-testing data were collected from library staff working at MoCU and NM-AIST libraries. Respondents were conveniently sampled during pre-testing of the research instruments. Respondents suggested the following: adjustment of some of the question, deletion of some of the questions, the addition of the questions which explain more about the activities conducted by library staff under the SECI Model, and reduction of the length of the questionnaire. Despite the pre-testing, other attempts which were taken to ensure that the results were valid and reliable were:-

- (a) Heading (date, interviewer and interviewee) for all instruments used;
- (b) Instructions for the interviewer to follow so that standard procedures are used;
- (c) Well designed questions;
- (d) Probes for the questions;
- (e) Space between questions to record responses (for the interviews);
- (f) A final thank you statement to acknowledge the time the interviewee spent during the interview
- (g) Training for research assistants on how to collect data; and

- (h) Ensuring that data and computer programmes are secure, including the use of encrypting techniques to prevent unauthorised access so that no one can attempt with the data collected before and after the analysis.

#### **4.6.4 Confirmatory factor analysis (CFA)**

Confirmatory Factor Analysis (CFA) was conducted to examine the reliability and validity of the measurement model employed in this study (See Chapter Five). The measurement model was assessed by using three criteria: reliability, Composite Reliability (CR) and Average Extracted Variance (AVE). Convergent validity relates to the degree to which multiple methods of measuring variables provide the same results (Hair et al. 2010). Reliability according to Hair et al. (2010) is an assessment of the degree of consistency between multiple measurements of a variable. On the other side, the reliability of factors was conducted by assessing the Cronbach's alpha, and factor loadings from CFA. Therefore, in this study, the Cronbach's alpha and factor loadings from the CFA were assessed. As proposed by Fornell and Larcker (1981), indicator factors loadings should be significant and exceed 0.7 to ensure both reliability and convergent validity.

CR assessed the internal consistency of the model. The recommended criteria for composite reliability is 0.70 or above (Hair et al. 2010). In addition, AVE was used to assess the convergent validity (O'Leary-Kelly and Vokurka 1998:399). The recommended thresholds for CR could be 0.70 or above, and an AVE of more than 0.50, then construct internal consistency is evidenced (Hair et al. 2010).

Discriminant validity was also conducted in this study. Discriminant validity is the degree to which measures of different latent variables are unique (O'Leary-Kelly and Vokurka 1998:399). That is for a measure to be valid; the variance in the measure should reflect only variance attributable to its intended latent variable and not to other latent variables (O'Leary-Kelly and Vokurka 1998:399). Discriminant validity is used to assess the extent to which a concept and its indicators differ from another concept and its indicators (Bagozzi and Phillips 1991). Fornell and Larcker (1981) assert that when a square root of the AVE is greater than its correlations with all other constructs then discriminant validity has been established.

In addition, construct validity determination is an important step to be done before structural model assessment. In this study, the same set of goodness-of-fit indices was used to observe the Structural Equation Modeling (SEM). The standardised path coefficient indicates the strengths of the relationships

between the independent and dependent variables.  $R^2$  represents the percentage of variance of a dependent variable that was explained by its predictors.

## **4.7 Data analysis**

Data analysis in multi-methods research relates to the type of research strategy chosen for the procedure. This study made the use of both quantitative and qualitative approaches to collect data. Thus, quantitative and qualitative measures were used to analyse the data.

### **4.7.1 Quantitative data**

Quantitative data are obtained in numeric form (Chireshe 2015). Quantitative data refers to all such data which can be a product of all research strategies ranging from simple counts such as the frequency of occurrences to more complex data such as text scores (Saunders, Lewis and Thornhill 2009:414). For quantitative data to be more useful they need to be analysed and interpreted. Thus, the analyses of quantitative data follow the following stages:

#### **4.7.1.1 Organising quantitative data for analysis**

Kombo and Tromp (2006) add that organising quantitative data for analysis include: gathering data from questionnaires, checking for data incompleteness and accuracy, and ignoring or removing those data that do not make any sense. Creswell (2009:151) recommends the following research tips for data analysis process:-

- (a) Report information on the number of members of the sample who did and did not return the questionnaire;
- (b) Discuss the method by which respondents bias will be determined....that is the effect of non-responses on the survey estimates;
- (c) Discuss a plan to provide a descriptive analysis of data;
- (d) Identify the statistics and statistical computer programme for testing the major inferential research questions; and
- (e) Present the results in tables or figures.

Chireshe (2015:109) adds that this type of data analysis uses “statistical methods to describe, summarise, and compare data”. On the other hand, Fowler (2014:127) highlights that the analysis of quantitative data involves the following steps:-

- (a) Designing the code (the rules by which a respondent's answers will be assigned values that can be processed by machine);
- (b) Coding (the process of turning responses into standard categories);
- (c) Data entry (putting the data into computer readable form); and
- (d) Data cleaning (doing a final check on the data file for accuracy, completeness and consistency).

Two common errors that normally occur during this process are coding decision errors and transcription or entry or entry (Bryman 2012: Fowler 2014). Data obtained for this study was coded and organised into data files with the aid of the SPSS programme.

#### **4.7.1.2 Quantitative data analysis**

The quantitative data analysis is a process of using statistical methods to describe, summarise and compare data (Creswell and Plano-Clark 2011:206; Polit and Beck 2003:729). The main objective of the quantitative data analysis is either to describe, to predict, to test a theory or causal inferences (Ahlquist 2010). The scale used in this study was as follows: 1-strongly disagree; 2-disagree; 3-neutral/undecided; 4-agree; 5-strongly agree. The total mean scale was used to determine how the five-point scales explain the findings obtained. Tabulation (tables) and graphical (graphs) were used to present the summary of the quantitative data (Babbie and Mouton 2001:458). Both descriptive and multivariate analyses were employed to analyse the quantitative data in this study.

Two main techniques of data analysis namely descriptive and multivariate analysis were employed using SPSS version 21. Descriptive findings were analysed by using SPSS version 21; while multivariate findings were analysed by using AMOS version 23. The choice of this software was based on its high descriptive and multivariate statistical power for analysing quantitative data. SPSS enables the input of raw data, modification, and organisation of data to carry out a wide range of simple, statistical and multivariate analyses (Blaxter, Hughes, and Tight 2010). The software has been widely applied by many scholars specifically in technology acceptance and user studies (Pelizzari 2003), and therefore considered suitable for this study as well.

#### **4.7.1.3 Descriptive analysis**

In this study, descriptive data analysis was done to address the entire research objectives except for the sixth objective which was analysed by using multivariate analysis. The objectives of this study are presented in Chapter One, Sub-Section 1.5.1.

Kripanont (2007) adds that descriptive statistics have a number of benefits including describing the characteristics of the sample, checking variables for any violation of the assumptions underlying the statistical techniques used, and addressing specific objectives. The detailed results from the descriptive analysis are presented in Chapter Five.

#### **4.7.1.4 Multivariate analysis**

The term multivariate analysis refers to all statistical methods that simultaneously analyse multiple measurements on each individual item or object under investigation (Hedges 2009). Such kinds of methods are used for analysing a large amount of information in an integrated manner. According to Harlow (2006), using multivariate statistics allows rich and realistic research designs to enable researchers to understand the complex relations among the variables being studied.

The main limitation of the multivariate analysis is its requirement for large samples as compared to Univariate analysis (Harlow 2006). The multivariate analysis was adopted in this case to address the seventh objective of the study which was: to investigate the factors that affect the application of Web 2.0 tools in KM practices in academic libraries. Therefore, the choice for adoption of the multivariate statistics in this study was motivated by the nature of the model employed to guide this study.

There are various multivariate techniques such as the principal component and factor analysis, multiple regressions, multiple discriminant analysis, logistic regression, multivariate analysis of variance and covariance, conjoint analysis, canonical correlation, cluster analysis, multidimensional scaling, correspondence analysis, linear probability model and structural equation modelling (Kothari 2004). Different multivariate techniques could be employed depending on the type of data and the nature of analysis required. However, in this study, multiple regression, measurement model, CFA and SEM were employed. The following subsections elaborate on how the two multivariate techniques were used to analyse data in this study.

#### **4.7.1.5 Measurement model**

The measurement model is used to explain the relationships between measured items (variables) and latent variables and is assessed in terms of construct validity (Stoelting 2002). The KMS success model was measured to see if it fits this study. Six constructs were identified to be measured if they will enhance the intention to use the model to enhance KM practices in the selected academic libraries in Tanzania which include: system quality, knowledge quality, service quality, user satisfaction, intention to reuse and net benefits. AMOS 23 was used to test the measurement model.

The common six model-fit indices used to evaluate the overall goodness-of-fit were: the  $\chi^2$  normalization by degrees of freedom ( $\chi^2/df$ ); the adjusted goodness-of-fit index (AGFI); the non-normalised fit index (NNFI); the comparative fit index (CFI); the incremental fit index (IFI); and the root-mean square error of approximation (RMSEA).

#### **4.7.2 Qualitative data analysis**

Data analysis in qualitative research consists of preparing and organising the data (i.e. text data as manuscripts, or image data as in photographs) for analysis, then reducing the data into themes through a process of coding and condensing the codes, and finally representing the data in figures, tables or discussion (Creswell 2013).

Payne and Payne (2004) assert that normally the data collection, coding and data analysis often occurs concurrently in qualitative research. Before analysing the data all the information should be presented in a format that will ease the categorisation process; qualitative data which was collected by using audio tapes should be transcribed into verbatim written format. The text should then be read as a whole to contextualise the information, thereafter the classification and ordering should be commencing (Payne and Payne 2004:38). The interviews for this study were transcribed. Both audio and transcribed files were stored in a computer database. These were read and coded manually, keywords and themes emerged from the data were grouped or classified as guided by the research objectives. In this study, qualitative data was thematically analysed.

Thematic analysis is a widely used qualitative data analysis method. It is the most common form of analysis in qualitative research which emphasises pinpointing, examining, and recording patterns (or "themes") within data set (Kombo and Tromp 2006:119). According to Braun and Clarke (2006:79), it is a qualitative analytic method for "identifying, analysing and reporting patterns (themes) within data. It minimally organises and describes your data set in (rich) detail. However, frequently it goes further than this, and interprets various aspects of the research topic". It is also a process of "encoding qualitative information; thus the researcher needs to develop "codes", words or phrases that serves as labels for sections of data (Boyatzis 1998).

#### **4.8 Ethical considerations**

Ethics refers to a code of conduct or expected societal norm of behaviour when conducting a research (Sekaran 2003:17). Ethics define what is or is not legitimate to do, or what "moral" research procedure involves (Neuman 2006:129). Ethical issues are of importance to all kinds of social and behavioural research and of particular importance when human subjects are involved (Powell and Connaway 2004).



Many ethical issues involve a balance between two values: the pursuit of scientific knowledge and the rights of those being studied or of others in the society (Neuman 2006:129). Every research must employ a number of ethical issues. According to O’Leary (2004:43), a researcher needs to recognise that power can influence the research process. Both the integrity of the knowledge produced and the wellbeing of the researched are dependent on the ethical negotiation of power and power relationships. Negotiation of power involves accepting responsibility to:-

- (a) Recognise and appreciate your own reality as a researcher;
- (b) Be cognisant of how your worldview, assumptions and position can unwittingly influence the research process; and
- (c) Act ethically. Research should be conducted in a manner that balances the biases and subjectivities of the researcher and protects the dignity and welfare of the researched.

The ethical responsibilities of research include recognizing, understanding and balancing subjectivities, accurate reporting, acting within the law, developing the appropriate expertise and experience of the researcher, designing and conducting equitable research, ensuring respondents have given informed consent, ensuring no harm comes to respondents and ensuring confidentiality and if appropriate, anonymity (O’Leary 2004). Creswell (2003:63) further described that ethical issues arise when specifying the research problem, purpose statement and research questions, and collecting, analysing and writing up the results of data. These observations indicate that ethical issues need to be considered at every stage of the research process.

UNISA requires all researchers to seek ethical clearance through the departmental Higher Degrees Committee to ensure that the research procedures are ethically sound (UNISA 2010). This study obtained this clearance before the commencement of data collection. Therefore, this study adhered to the UNISA research ethics policy throughout the study (UNISA 2010).

The questionnaire included an introduction letter with information regarding the researcher, and details confirming that in line with UNISA’s policy on research ethics (UNISA 2010). The information collected was strictly for research purposes and would be kept confidential. Interviewees were also provided with the same information. Though permission to conduct the study was granted by the selected universities, participation in the study was voluntary (Fowler 2014). Participants were given the choice to declare their participation in the study. Interviewees were informed that the interviews were recorded and they gave consent to this before starting the interviews.

The researcher has ensured confidentiality and privacy whereby each participant was informed about what happens to data collected from them. Further, all sources used in the study were acknowledged to avoid plagiarism. The information provided about the study gave participants adequate information to make an informed choice about whether to participate in the study or not.

#### **4.9 Evaluation of the research methodology**

Research methods should be evaluated to explain what information was needed, how it was collected, and analysed (Ngulube 2005:139). According to Willig (2001), evaluation of research methods ensures that the research methods are appropriate to the research questions and compatible with the kind of knowledge the study is aiming to produce. In evaluating the research methodology, this study considered several issues including the appropriateness of the data collection methods, the successes and challenges faced during data collection, how the study overcame the challenges, and if the researcher recommended this methodology for future research in the same field.

The study used a multi-methods approach whereby both quantitative and qualitative data were collected. The survey was used to collect quantitative data whilst the interview guide/protocol and observation checklist were used to collect qualitative data. The use of multi-methods enabled the researcher to triangulate the methods (quantitative and qualitative) at data collection, resulting in rich data sets and thus improving reliability and validity of the research findings. As argued by Creswell (2009); Jupp (2006) and Neuman (2014), triangulation enables a researcher to make the best out of the strengths of the different research methods while minimising the weaknesses of the same research methods.

In addition, Romm and Ngulube (2014) state that multi-methods research as conceptualised by Creswell (2013) was designed to guarantee the reliability and validity of quantitative measures although they may be used in qualitative traditions. By using a multi-methods strategy, the researcher was able to collect data from different sources and provided explanations and meanings which would not have been possible had a single source been relied upon. Bryman (2006) suggests that multi-methods approach can allow for the limitations of each approach to be minimised while strengths are built upon; therefore providing stronger and more accurate inferences.

This study was conducted in eight academic libraries to explore library staff's knowledge and experiences on the application of Web 2.0 tools and enhancement of KM practices in academic libraries in Tanzania

to ensure transferability of the findings. The result of this study was expected to be applicable and used in other academic libraries (both private and public) in the country and outside the country.

The popularity of quantitative methods derives from the possibility of making the generalisation (Bryman 2004). This study employed questionnaire to collect quantitative data. Bryman (2004) mention two limitations; the number of question is always limited, not to mention their scope and some of the questions may be difficult to translate into “closed questions” especially if dealing with sensitive subjects, or when searching for meaning and understanding. These problems were minimised during the pre-testing of the questionnaires whereas all the complicated questions were clarified, simplified and corrected.

Flick (2011) adds that generalisation in qualitative research is the gradual transfer of the findings from cases studies and their context or more general and abstract relations. The expressiveness of such patterns can then specify how far different theoretical and methodological perspectives on the issue that have been triangulated. In this study, an attempt was made to provide thick descriptions of the qualitative study findings to maximise the transferability of the study findings and inferences to other similar cases.

The researcher physically visited all the research sites. Problems observed in some of the research sites were as follows: some of the respondents were reluctant to co-operate and to answer some of the questions asked, some of them were not in their offices during the visits and this made the researcher miss some significant data, and some of them claimed to be very busy for the interviews. Some of the interviews were conducted through telephones which sometimes were not clear due to the bad connection.

Despite the problems faced during data collection, this study recommends that questionnaire which was used to collect quantitative data should be supplemented with both semi-structured interview and observation. On the whole, the multi-method research design enabled the study to bring together a more comprehensive account of the area of inquiry where both quantitative and qualitative research methods were used. This study thus recommends that future researchers use multi-method research design when they are conducting studies investigating the application of Web 2.0 tools and KM practices’ enhancement in academic libraries.

#### **4.10 Chapter summary**

The aim of this chapter was to present and discuss the research methodology of the study. The chapter included research design, study population, sampling procedure, data collection procedure and instruments, data analysis, validity, reliability, research ethics and evaluation of the research

methodology. The purpose of the study was identified as a mainly descriptive and explanatory, employing multi-method research. The research design included discussions regarding target population and sampling procedures, research strategy, pre-testing of research instruments, pilot study and data analysis techniques. The survey, interview and observation were chosen for data collection.

Quantitative data analysis techniques using descriptive and multivariate methods were adopted in this study. Triangulation was revealed to be a multifaceted concept that can be explained from different stages in the research process. Issues of validity and reliability were importantly considered in ensuring the credibility and trustworthiness of the research findings. The triangulation of the research methods enabled the study to gather both qualitative and quantitative data and to check for the accuracy of the data gathered by each method. It was also important for the research to adhere to and address research ethical guidelines. Data collected in the study comprehensively addressed the research objectives and questions.

## CHAPTER FIVE

### PRESENTATION AND ANALYSIS OF DATA

#### 5.0 Introduction

The aim of this chapter was to report the outcome of data analysis which transformed the raw data obtained from the study into meaningful facts. A total of eight academic libraries from public universities were surveyed. The data presented in this study was obtained from the questionnaire, semi-structured interviews and non-participant observation.

This study collected both quantitative and qualitative data. Both the quantitative and qualitative data were analysed separately and then triangulated to form a complete whole. The quantitative data was analysed with the aid of SPSS version 21 and AMOS version 23. A number of tables and charts were developed to make the data easily comprehensible. On the other hand, qualitative data was thematically analysed and the emerging themes were used to substantiate the quantitative data. This information is presented in the form of narrative text.

Bryman (2012: 13) describes data analysis as the “management, analysis and interpretation of the data”. Bryman (2012:13) provides examples such as the statistical analysis of the quantitative data and thematic analysis of the qualitative data. The reasoning behind this is to enable the researcher to make sense of all the gathered information. Likewise, Creswell (2009:152) argues that analysed data helps the researcher to draw conclusions and therefore to answer the research questions.

#### 5.1 Data presentation

Any doctoral study involves the gathering of a significant amount of data, and if the data is not presented in an organised manner this can defeat the purpose of contributing to the field of knowledge and rather lead to confusion instead (Bryman 2012). Therefore, to avoid the confusion, the presentation of study findings was guided by research objectives (see section 5:2 of Chapter One) which aimed at the following objectives:-

1. To determine the level of KM awareness among library staff in academic libraries in Tanzania;
2. To assess the application and benefits of KM practices in academic libraries;

3. To examine the key KM enablers for the application of KM practices in academic libraries in Tanzania;
4. To examine knowledge creation and knowledge sharing practices in academic libraries;
5. To investigate the access and use of Web 2.0 tools in academic librarians in Tanzania;
6. To assess the application of Web 2.0 tools for KM implementation in academic libraries in Tanzania;
7. To investigate the factors that affect the application of Web 2.0 tools in KM practices in academic libraries; and
8. To determine the challenges that hinder the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania.

## 5.2 Response rate and background of respondents

Despite the fact that the background of respondents was not part of the study objectives, but they could partly explain the application of Web 2.0 tools and KM related activities in the sample under study. Different researchers have different views on what should be considered as an acceptable response rate. Babbie and Mouton (2009:261) explain that any response rate which is above 50% is adequate for analysis. In addition, Bryman (2012:235) asserts that a 50% relatively rate is barely acceptable, pointing out that a response rate that stood at 60-69% is more acceptable. Out of 278 questionnaires distributed to library staff, 254 were returned yielding a 91.36% response rate. Table 5.2:1 gives an overview of the distribution of questionnaires in each academic library.

Table 5.2:1 Distribution of questionnaire in academic libraries

Academic library	Questionnaire distribution (N=278)	Response rates (N=254)
University of Dar-of-Dar-es-Salaam Library	73(28%)	71(28%)
The University of Dodoma (UDOM) Library	48(17%)	45(17.7%)
Mzumbe University (MU) Library	44(16%)	40(15.7%)
Sokoine National Library (SNAL)	36(12%)	31(12.2%)
Open University of Tanzania (OUT) Library	22(8%)	20(7.9%)
Ardhi University (ARU) Library	20(7%)	18(7.1%)
Muhimbili University of Health and Allied Sciences (MUHAS) Library	20(7%)	15(5.9%)
The State University of Zanzibar (SUZA) Library	15(5%)	14(5.5%)

Respondents totalling to 129 (50.8%) were men and 119 (46.9%) respondents were female. Half of the respondents 119 (46.9%) were middle aged from 21 to 30 years. There were two major groups of

ranks/work position identified in this study: administrative staff and academic staff. Respondents 181(71.3%) were administrative staff and respondents 73(28.7%) were academic staff. Administrative staff includes library assistants, librarian, IT specialists, principal librarians, chief librarians, secretary and accountants: while academic staff includes: library professors, associate library professors, senior librarians, librarians and assistant librarians. Four departments were identified in this study: readers' services, collection development, library schools and information studies, and ICTs and e-resources. Half of respondents 132 (52.0%) were working at readers' service departments in selected academic libraries. Table 5.2:2 presents characteristics of respondents on surveys.

Table 5.2:2 Background of respondents: survey (questionnaire) (N=254)

		<b>Frequencies</b>	<b>Percentages</b>
Gender			
	Male	129	50.8
	Female	125	49.2
Age			
	21-30 years	119	46.9
	31-40 years	100	39.4
	41-50 years	27	10.6
	Above 51 years	8	3.1
Job location			
	ARU	18	7.1
	OUT	20	7.9
	MUHAS	15	5.9
	MU	40	15.7
	SUA	31	12.2
	SUZA	14	5.5
	UDSM	71	28.0
	UDOM	45	17.7
Rank			
	Administrative staff	181	71.3
	Academic staff	73	28.7
Working department			
	Readers' services	132	52.0
	Collection development	82	32.3
	ICT and E-resources	31	12.2
	Information studies	9	3.5

On the other hand, 69 senior library staff (library directors, heads of library departments and library managers) was approached for semi-structured interviews; 57 participants were interviewed in which

respondents 35 (61%) were men and 22 (39%) were female. This yielded 82.6 % response rate. The majority of the respondents in this category 38 (66%) were elderly of between 41 to 50 years. Table 5.2.3 indicates characteristics of respondents: semi-structured interviews.

Table 5.2:3 Background of respondents: semi-structured interview (N=57)

		Frequencies	Percentages
Gender	Male	35	61
	Female	22	39
Age	41-50	38	66
	51-60	10	18
	31-40	9	16
Job location	UDSM	11	19
	MU	10	18
	OUT	8	14
	UDOM	7	12
	SUA	7	12
	SUZA	5	9
	MUHAS	5	9
	ARU	4	7

### 5.3 KM awareness

The KM awareness is used to explain the level of understanding of the KM practices among library staff. One- third of the respondents 82 (32.3%) had adequate information about the KM concept. This indicated a low level of KM awareness among respondents. On the other hand, one third of the respondents 70 (27.6%) had never heard about the KM concept. Table 5.3:1 presents the level of KM awareness amongst library staff in the selected academic libraries.



Table 5.3:1 KM awareness among respondents

	Frequencies	Percentages
What is your level of awareness of the KM concept?		
Adequate information	82	32.3
Never heard	70	27.6
Heard but challenging	54	21.3
Heard but not sure	48	18.9

KM is a new concept and is among the hot topics which needed to be integrated into information studies' curriculum in Tanzania and Africa in general. Two respondents have reported that:

*I am sure that most of us (library staff) are not sure about the KM concept however it is indicated that most of what we do are KM practices; therefore I suggest more KM training and other KM activities be integrated in order to engage library staff on the KM concept.*

And

*There still is a misunderstanding between IM and KM and their application in academic libraries. Therefore a demarcation between information management and KM and their utilisation in academic libraries needs to be well explained and documented.*

### 5.3.1 KM training and KM training programme

KM training and KM training modules/programmes were identified and discussed. Half of respondents 142 (55.9%), had not obtained KM training. Among respondents, 112 (44.1%) had obtained KM training; two fifths of respondents, 45 (40.17%), obtained KM training through self studies (such as literature, libraries, audio and video programmes), 41 (36.60%) respondents obtained KM training through short courses (such as certificates programmes, workshops and seminars), 19 (16.98%) respondents obtained KM training through long courses such as degrees, and 7 (6.25%) respondents obtained KM training through long courses such as postgraduate programmes (master, PhD). Table 5.3:1.1 presents both KM training and KM training programmes among library staff.

### 5.3.1:1 Individual KM training and KM training programmes

	Frequencies	Percentages
Have you ever attended KM training?		
No	142	55.90
Yes	112	44.10
How did you get KM training (KM training programmes)?		
Self study	45	40.17
Short courses	41	36.60
Degree	19	16.98
Postgraduate	7	6.25

One the respondents who attended KM training reported that:

*I attended a KM training, for two weeks in India, but I think I need more training, I think KM is very important and it needs a full course programme such as diploma and/or degree.*

Another respondent who did not attend any KM training claimed that:

*I have not attended any KM training because most libraries in Tanzania do not take KM practices seriously as compared to other library activities, thus, even if a library staff attended a KM training no one will care. This is very discouraging; however, there is a need to have KM skills and to encourage other librarians to attend KM training.*

Concerning KM programmes attended, respondents have reported that:

*I lecture the information science course in two universities in our country, but I would like to admit that KM is not among the information studies' topics, thus, how can library staff and students understand the KM concept? KM must be incorporate in information studies subjects.*

And

*I admit that the KM concept is among the important topics in our school of library studies since we started a diploma course and we have already integrated KM concept in the coming degree programme, and probably by the next programme year, it could be implemented.*

The study did not observe any KM training conducted among the visited libraries. On the other side, no training programmes observed among the visited universities which conducting LIS training.

#### **5.4 Application and benefits of KM practices**

The application and benefits of KM practices need to be investigated. This section is divided into two sub-sections: KM application and the benefit of KM application in academic libraries.

##### **5.4.1 Application of KM practices**

One third of respondents, 83 (32.7%) reported on the application of KM practices in their libraries. Further, regression analysis was conducted to analyse the application of KM practices based on the background of respondents. The findings revealed that male respondents applied KM practices compared to female respondents. On the other hand, middle age group ranged between 41-50 years applied KM compared to other age groups. MUHAS Library showed the strongest effect ( $p < 0.001^{***}$ ) on the application and use of KM practices, followed by OUT Library ( $p < 0.014^{**}$ ) and then SUZA Library ( $p < 0.051^{*}$ ).

The findings have revealed that there was no statistically significant effect on the application of KM among ranks; however, administrative staff significantly applied KM practices compared to academic staff. Lastly, there was no statistically significant effect in working departments; however, ICT and e-resources departments show the positive effect on the application of KM practices as compared to other departments. Table 5.4:1.1 provides logistic regression for factors associated with KM application in academic libraries.

Table 5.4.1:1 Logistic regression for factors associated with KM application

Factors	N	S.E.	Sig.	Exp (B)	95% CI for EXP (B)	
					Lower	Upper
Male	129					
Female	125	0.309	0.923	0.971	0.530	1.778
Age						
21-30	119					
31-40	100	0.869	0.136	0.274	0.050	1.502
41-50	27	0.853	0.198	0.334	0.063	1.778
50+	8	0.911	0.189	0.302	0.051	1.801
Academic library						
ARU	18					
OUT	20	0.597	0.014	4.361	1.352	14.067
MUHAS	15	0.673	0.001	9.257	2.475	34.629
MU	40	1.100	0.105	0.169	0.020	1.455
SUA	31	0.521	0.984	1.010	0.364	2.806
SUZA	14	0.687	0.051	0.262	0.068	1.006
UDSM	71	0.674	0.633	1.380	0.368	5.172
UDOM	45	0.476	0.903	0.944	0.371	2.398
Rank						
Administrative staff	181					
Academic staff	73	0.375	0.381	0.720	0.346	1.502
Department						
General circulation	132					
Collection	82	0.479	0.257	0.581	0.227	1.487
Information studies	9	0.521	0.199	0.513	0.185	1.422
E-resources and ICT	31	0.991	0.405	0.438	0.063	3.052

\*=significant at 0.05; \*\*=significant at 0.01; \*\*\*=significant at 0.01<0.001

In the view of KM application in academic libraries, respondents have reported that:

*I think KM application needs expertise and as far as I know we have very few KM experts in the country; on the other side, I know that the application of KM practices needs time and money which are the major problems in most of our libraries.*

The study has observed the lack of KM application in most of the visited libraries especially in large academic libraries such as MUHAS, MU and UDSM Libraries. The study has also observed that sometimes library staff in the selected academic libraries was overwhelmed by congestion of library users which might limit them from applying KM practices effectively.

#### 5.4.2 The benefits of KM practices

The study, therefore, has determined the benefits of KM practices in academic libraries. Using a five-point Likert scale, the findings showed that the majority of the respondents applied KM practices to identify KM expertise (M=4.36), and to improve library services and productivity (M=4.36). In addition, majority of respondents applied KM practices to create knowledge repositories (M=4.25), and to enhance knowledge innovation (M=4.23). Further analysis has showed that among the benefits of KM practices in the academic libraries were to establish best practices, to manage information explosion, and to develop corporate memory. Table 5.4.2:1 indicates the benefits of applying KM practices in academic libraries.

Table 5.4.2:1 The benefits of KM practices in academic libraries (N=254)

Advantages of KM practices	Strongly Disagreed	Disagreed	Neutral/ undecided	Agreed	Strongly agreed	Mean
To identify KM expertise	5(2.0%)	6(2.4%)	21(8.3%)	75(29.5%)	147(57.9%)	4.36
To improve library services and productivity	6(2.4%)	4(1.6%)	23(9.1%)	96(37.8%)	125(49.2%)	4.36
To create knowledge repositories	4(1.6%)	8(3.1%)	13(5.1%)	96(37.8%)	133(52.4%)	4.25
To enhance knowledge innovation	4(1.6%)	5(2.0%)	15(5.9%)	109(42.9%)	121(47.6%)	4.23
To establish best practices	4(1.6%)	7(2.8%)	11(4.3%)	108(42.5%)	124(48.8%)	4.21
To manage information explosion	4(1.6%)	6(2.4%)	30(11.8%)	107(42.1%)	107(42.1%)	4.17
To develop corporate memory	8(3.1%)	2(0.8%)	15(5.9%)	107(42.1%)	122(48.0%)	4.13

Other benefits of KM practices described by among the visited academic libraries include: to facilitate the flow of knowledge within and outside the institution, to preserve the created knowledge for future use and to enhance various activities such as providing the right knowledge to the right user, to enhance information access and retrieval and, to facilitate the collection and development of library materials. Respondents believed that:

*Among the benefits of KM practices in our library is to utilise the knowledge created within the institution therefore to facilitate the effective use of such knowledge for the benefit of the whole community.*

And

*KM practices help academic libraries to expand their vision and missions so as to attract more library users. For example, through KM practices, academic libraries can increase the number of reading materials by identifying the knowledge needs of their users thus attracting more users to use such materials.*

However, the study did not observe KR among the visited libraries; the study also observed the availability of IR at MU, SUA and MUHAS Libraries to store theses, dissertations, research reports and other academic articles.

### **5.5 KM enablers for effective KM application in academic libraries**

Academic libraries need to employ KM enablers to facilitate the application of KM practices. Respondents were asked to mention KM enablers that they thought could be employed to facilitate the application of KM practices in their libraries. KM enablers refer to ways/means which could be integrated to enhance KM practices.

Using a five-point Likert scale, the findings have indicated that majority of respondents considered competencies and skills (M=4.64), and KM policy and guidelines (M=4.62). Other respondents considered organisational culture (M=4.59), and management support and leadership (M=4.58). Further analysis showed that respondents considered incentives (M=4.56), trust (M=4.55), KM training (M=4.55), and IT support (M=4.40). Table 5.5.1 indicates KM enablers for the application of KM practices in academic libraries.

Table 5.5:1 KM enablers for the application of KM practices

<b>KM enablers</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral/ undecided</b>	<b>Agree</b>	<b>Strongly agree</b>	<b>Mean Value (M)</b>
Competencies and skills are very important for effective application of KM practices	0(0.0%)	0(0.0%)	3(1.2%)	84(33.1%)	167(65.7%)	4.64
KM policy and guidelines are provided to enhance KM practices in my library	0(0.0%)	0(0.0%)	1(0.4%)	95(37.3%)	158(62.4%)	4.62
Organisational culture is provided to support KM practices	0(0.0%)	0(0.0%)	3(1.2%)	99(39.0%)	152(59.8%)	4.59
Management support and leadership are provided to enhance KM practices	0(0.0%)	0(0.0%)	3(1.2%)	98(38.6%)	153(60.2%)	4.58
Organisation provides incentives for members participated in KM practices in the library	0(0.0%)	0(0.0%)	5(2.0%)	101(39.8%)	148(58.3%)	4.56
Organisation provides enough trust to staff to join KM practices	0(0.0%)	1(0.4%)	3(1.2%)	103(40.6%)	147(57.9%)	4.55
KM training and education are usually conducted to impart staff with various KM techniques	0(0.0%)	0(0.0%)	1(0.4%)	111(43.7%)	142(55.9%)	4.55
IT facilities and support are available to enhance KM practices	0(0.0%)	0(0.0%)	6(2.4%)	140(55.1%)	108(42.5%)	4.40

Most of the respondents have reported the importance of KM enablers to enhance KM practices. Respondents mentioned the advantages of IT as follows:

*Nowadays, IT makes things easy and there is no need for people to meet face to face or to travel very far in order to look for knowledge, all these can be facilitated by the application of IT. Therefore, libraries need to have IT in order to improve their services.*

Other respondents have reported the advantages of training as follows:

*We need to be trained in order to participate fully in KM practices because most of us do not have required skills.*

And

*Training is very important for effective KM practice and application in academic libraries.*

Respondents have reported the advantages of rewards as follows:

*I suggest that rewards such as; training, promotion and allowances are very important in encouraging library staff to employ the use of KM practices.*

And

*Libraries need to provide support such as; training, recognition, and promotion in order to encourage their staff to apply KM practices.*

And

*Motivation is the only way of making things run smoothly in any organisations. Motivation can be in the way of monetary or non-monetary form; one wonders why academic libraries are not motivating their staff. They can establish ways of motivating staff by the use of non-monetary which may include a letter of recognition or appreciation and day off from work.*

And

*Incentives and rewards need to be awarded to those who participate in KM application so as to encourage others to join the wheel.*

Another respondent has reported the advantage of organisational culture as follows:

*Academic institutions need to have a culture which will facilitate the implementation of KM practices.*

In addition, other respondents have reported the advantages of management support as follows:

*I think management support is very important since it deals with staff affairs however; most of the human resource departments always discourage people when it comes to their rights to share knowledge.*

And

*Management support is like an organ which could support all the activities which are conducted in an organisation. Management support could ensure availability of resources and conducive environment for the KM practices.*



And

*As far as I understand, we need to get support from management. The present state of affairs seems to suggest that they are not aware that their libraries need to start applying KM practices. Therefore, in my opinion, the application of KM practices in most academic libraries needs to be supported by their parent organisation/management. Full support from the management will be highly appreciated for the effective application of KM practices in our libraries.*

Respondents have recommended the establishment of KM policy as follows:

*Senior library staff in collaboration with policy makers needs to make KM expectations clear by explicitly starting with what needs to be done in the application of KM practices and by whom.*

And

*KM policy must include all the necessary issues which need to be implemented in order to implement KM practices such as motivation to employees who participate in KM practices must be well defined.*

The study has observed management support towards individual library staff whereby the majority of the staff attended LIS schools under the management support for them to acquire more knowledge to improve library services. IT support was observed in most of the visited libraries whereby the researcher noted the availability of IT specialists working in such libraries. The study has also observed a number of ICTs infrastructures such as internet connection, Wi-Fi devices, computers (Laptop and desktop), printers, photocopiers and the like.

The study findings did not observe direct KM enablers in most of the visited libraries. The study observed the availability of library policies in ARU, MUHAS and SUA Libraries. In addition, the study observed MUIR Policy. KM policy was not observed in any of the visited libraries. Lack of trust among library staff was observed; however, teamwork and collaboration existed among library staff in some of the visited libraries.

## **5.6 KM practices through SECI processes**

Respondents were asked to select various activities which could be performed under SECI processes to ensure KM practices (knowledge creation and sharing) in academic libraries. Therefore, the following

subsections explain each of the SECI processes to enhance knowledge creation and sharing practices in academic libraries.

### 5.6.1 Socialisation process

Socialisation is used to determine the degree to which individuals in the organisation are involved in various socialisation processes to enhance knowledge creation and sharing activities. Using a five-point Likert scale the findings showed that the majority of respondents gathered information from various library activities (M=4.17), and others shared experiences with library staff and library users (M=4.17). Further analysis showed that the academic libraries needed to select a permanent room for socialising and sharing information (M=4.12). Table 5.6:1 indicates knowledge creation and sharing under the socialisation process.

Table 5.6:1 Knowledge creation and sharing practices under socialisation process

Knowledge creation and sharing practices through socialisation process	Strongly Disagreed	Disagreed	Neutral/ undecided	Agreed	Strongly agreed	Mean value (M)
Gather knowledge from various library activities	3(1.2%)	10(3.9%)	22(8.9%)	126(49.6%)	96(36.6%)	4.17
Share experiences with library staff and library users	1(0.4%)	11(4.3%)	19(7.5%)	137(53.9%)	86(33.9%)	4.17
Have a social place for creation and sharing of knowledge	2(0.8%)	12(4.7%)	33(13.0%)	114(44.9%)	93(36.6%)	4.12
Have a culture to create and share new knowledge	0(0.0%)	14(5.5%)	38(13.0%)	116(45.7%)	86(33.9%)	4.08
Interact and conduct departmental meeting with external experts	2(0.8%)	11(4.3%)	48(18.9%)	113(44.5%)	80(31.5%)	4.00
Find new strategies and opportunities inside the library	7(2.8%)	9(3.5%)	36(14.2%)	134(52.8%)	68(26.8%)	3.88
Develop network outside the library to library management	5(2.0%)	12(4.7%)	54(21.3%)	120(47.2%)	63(24.8%)	3.97

Generally, socialisation depicts few points because most of the respondents argued that knowledge cannot be created and/or shared through socialising because there is no connection between social issues and knowledge. Respondents have reported the following under socialisation.

*People can never be serious when they are socialising because it is a time when people relax and share ideas about their social issues.*

And

*Through socialisation I don't think you can get something critical, I think that is not a good process of creating and sharing knowledge especially in higher learning institutions.*

And

*The library could set apart a room for socialising among library staff...I concur with my colleague who is in the USA because he always took me to a meeting room during tea break where people were discussing critical points which were useful. And you may find people with pen and paper noting...yes, I think through socialising, we can get something good which one can use to build an idea.*

And

*A library can select or build a room which contains Television Set and magazines where people can go and discuss important issues and share news and necessary information from Television and magazine. Soft drinks such as coffee and water can be provided if possible.*

The study has observed few social events conducted in most of the visited libraries. The study has also observed special rooms in three of the visited academic libraries which were used by the staff during tea break; however, such rooms had few and out of date newspapers in one of the rooms. In respect to sharing of experiences and skills, this study observed few senior staff guiding junior staff on how to perform library duties such as how to conduct reference service and information retrieval.

### **5.6.2 Externalisation process**

Externalisation explains the degree to which the individuals in the organisation intended to be involved in externalisation process. Using a five-point Likert scale, the findings showed that the majority of respondents participated in current awareness services (CAS) (M=4.20), exchanged the academic information, ideas, and opinions with colleagues (M= 4.04). Further analysis showed that majority of respondents collected knowledge from both inside and outside the library (M=4.02). Table 5.6.2 shows knowledge creation and sharing under the externalisation process.

Table 5.6:2 Knowledge creation and sharing practices through externalisation process

<b>Knowledge creation and sharing practices through externalisation process</b>	<b>Strongly Disagreed</b>	<b>Disagreed</b>	<b>Neutral/ undecided</b>	<b>Agreed</b>	<b>Strongly agreed</b>	<b>Mean value (M)</b>
Conduct CAS.	2(0.8%)	6(2.4%)	26(10.2%)	125(49.0%)	96(37.6%)	4.20
Exchange ideas and opinions with colleagues	6(2.4%)	7(2.87%)	44(17.3%)	115(45.3%)	82(32.3%)	4.04
Collect knowledge from inside the library such as manuals and reports	2(0.8%)	13(5.1%)	38(14.9%)	122(47.8%)	79(31.0%)	4.03
Collect knowledge from outside the library such as policies/strategies	3(1.2%)	12(4.7%)	39(15.3%)	122(47.8%)	79(31.0%)	4.03
Participate in writing and documenting minutes in a meeting	1(0.4%)	9(3.5%)	41(16.1%)	130(51.2%)	73(28.7%)	4.02
Engage in library various groups and become among the members	7(2.87%)	12(4.7%)	42(16.5%)	108(42.5%)	85(33.5%)	3.99
Develop and disseminate brochures, leaflets, and posters	7(2.87%)	12(4.7%)	32(12.6%)	133(52.4%)	70(27.6%)	3.97

Respondents have reported on how they created and shared knowledge under externalisation process. The majority of the respondents mentioned various activities such as: to exchange ideas with colleagues, collect information from and outside the library, and to participate in meetings and to send alerts to inform the community on the arrival of new materials in the library. One respondent suggested that:

*I think attending meetings will help librarians to gain views and insights on KM application, thus, libraries need to conduct meetings to enhance the creation and sharing of knowledge under externalisation; however, it depends on the activities someone is doing in the library.*

This study has observed a number of brochures and posters providing information and news about various events and the new materials which are recently received in SUZA and UDOM Libraries' notice boards. The study also observed that most of such information and announcements explain about the usage of the library, ongoing and coming workshops and seminars and new arrivals to such libraries. The study also observed departmental meeting conducted within the selected academic libraries.

### 5.6.3 Combination process

The combination process involves the degree to which the individuals in the organisation intended to be involved in combination process. Using a five-point Likert scale the findings showed that majority of respondents facilitated the acquisition and integration of knowledge (M=4.26), and developed and created training materials and then disseminated them to library users (M= 4.14). Further analysis showed that respondents collected external knowledge (M=4.09), and participated in writing library guidelines, reports and policies (M=4.08), and participated in writing strategic planning and operations (M=4.04). Table 5.6.3 indicates knowledge creation and sharing practices under the combination process.

Table 5.6:3 Knowledge creation and sharing practices under combination process

<b>Knowledge creation and sharing practices through combination process</b>	<b>Strongly Disagreed</b>	<b>Disagreed</b>	<b>Neutral/ undecided</b>	<b>Agreed</b>	<b>Strongly agreed</b>	<b>Mean value (M)</b>
Facilitate acquisition and integration of knowledge.	2(0.8%)	4(1.6%)	18(7.1%)	132(51.8%)	99(38.8%)	4.26
Develop and create training materials and disseminate them to library users	3(1.2%)	7(2.7%)	31(12.2%)	125(49.0%)	89(33.1%)	4.14
Collect external knowledge such as manuals/reports/ policies/strategies	3(1.2%)	15(5.9%)	29(11.4%)	118(46.3%)	90(35.3%)	4.09
Participate in writing guidelines, reports, literatures, policies/strategies etc.	5(2.0%)	9(3.5%)	37(14.5%)	113(44.3%)	91(35.7%)	4.08
Participate in writing strategic planning and operations.	6(2.4%)	11(4.3%)	33(12.9%)	120(47.2%)	84(32.9%)	4.04
Create databases on knowledge and services	5(2.0%)	32(12.5%)	29(11.4%)	116(45.5%)	73(28.6%)	3.86

Other activities which are conducted under the combination process which includes writing library annual reports, exchanging knowledge and ideas among library staff, conducting training for library users on how to utilise library resources, and classifying and cataloguing library materials and making them available for library users. Respondents reported on the following activities:

*We are always participating in various discussions whereby staff exchanges knowledge and ideas on emerging issues which need attention from staff members.*

And

*We are always teaching our library users how to utilise library resources.*

And

*Cataloguing and classification of library materials are always conducted in order to ensure library receives new materials to help library users to find their needed knowledge.*

And

*Most of our books and other reading materials are well catalogued and classified and we are using the library of congress classification scheme (LCCS).*

And

*We always train our users on how to do reference, bibliography and how to do the literature search, but this training is for postgraduate students only and not formal.*

The study has observed library policies at the MUHAS, MU and ARU Libraries which are used to guide the access and use of such libraries and their resources; however, these were no KM policy observed in any of the visited libraries. There are various activities which were included in the policies observed explaining the activities which fall under SECI processes that help in the creation and sharing of knowledge within such libraries. For example, collection development components such as selection of library materials, acquiring of those materials and weeding processes are included. In addition to collection development activities, the study observed library staff cataloguing and classifying new books. Resource sharing procedures were observed in the library policies.

#### **5.6.4 Internalisation process**

The internalisation process involves the degree to which the individuals in the organisation intend to be involved in the internalisation process. Using a five-point Likert scale, the findings showed that the majority of the respondents participated in learning and training activities (M=4.15), and asking questions during meetings and presentations (M= 4.11). Further analysis has indicated that respondents conducted selective dissemination of information (SDI) services (M=4.09), and conducted surveys and then shared results with colleagues and library users (M=4.06). Table 5.6.4 indicates knowledge creation and sharing practices under the internalisation process.

Table 5.6:4 Knowledge creation and sharing practices under internalisation process

<b>Knowledge creation and sharing practices through internalisation process</b>	<b>Strongly Disagreed</b>	<b>Disagreed</b>	<b>Neutral/ undecided</b>	<b>Agreed</b>	<b>Strongly agreed</b>	<b>Mean value (M)</b>
Participate in learning and training activities within the library/institution	5(2.0%)	9(3.5%)	28(11.0%)	114(44.7%)	99(38.8%)	4.15
Asking questions during meetings or during presentations	2(0.8%)	6(2.4%)	42(16.5%)	116(45.5%)	89(34.9%)	4.11
Participate in selective dissemination of information e.g. sending new arrival to specific department/individual	6(2.4%)	10(3.9%)	38(14.9%)	101(39.6%)	100(39.2%)	4.09
Participate in conducting surveys and share results in the library	2(0.8%)	12(4.7%)	39(15.3%)	117(45.9%)	85(33.3%)	4.06
Present papers in conferences	6(2.4%)	9(3.5%)	41(16.1%)	117(45.9%)	82(32.2%)	4.02
Participate in research groups discussions	4(1.6%)	13(5.1%)	41(16.1%)	117(45.9%)	80(31.4%)	4.00

Respondents have reported how they are creating and sharing knowledge through internalisation through the following activities present papers in various conferences both within and outside the country, participate in creative and essential dialogue, and learning by observing and doing various library activities within and outside the country. Some of the respondents' responses were as follows:

*I participated in various training and workshops, such as the workshop on the use of OJS and IFLA conferences and I learned different things for libraries. I also participated in teaching information literacy to undergraduate students in the campus.*

And

*I presented three papers in the past three years in various conferences.*

And

*We always present papers in departmental meetings before the final presentation to the conference in order to allow staff to comment and share in order to improve the presentation.*

And

*We write many papers and present them at various conferences; however, sometimes we fail to attend conferences due to budget constraints.*

The study has observed information literacy learning and/user orientation programmes in most of the visited libraries. The main purpose of these training was to familiarise library users with the various activities offered by such libraries such as how to access, retrieve and use the library resources. The study also observed an information literacy programme at MUHAS Library. The study has observed library schools among the selected academic libraries which are conducted by the library staff; for example, MU and SUA Libraries which offers certificates, diploma and degree in library field.

In addition, the study has observed a lack of knowledge sharing culture among the selected libraries. Most of the library staff was busy with other library activities and personal issues; there was no sharing of knowledge observed. Lack of motivation and encouragement to make library staff participate in knowledge creation and sharing practices were observed among the selected libraries. There was the lack of KM enablers in most of the selected libraries. The study also observed the lack of trust among library staff.

## **5.7 The access and use of Web 2.0 tools in academic libraries**

In order to access and use Web 2.00 tools to facilitate academic libraries services, this section is divided into the following sub-sections:

### **5.7.1 Web 2.0 tools awareness and Web 2.0 accounts**

Prior to investigating the access and use of Web 2.0 tools in academic libraries, it was deemed necessary to find out the level of awareness and use of Web 2.0 tools among respondents. The study findings indicated that most of respondents 230 (90.6%) were aware of the Web 2.0 tools and they had used different types of Web 2.0 tools available on the internet. Further analysis has showed that most of the respondents had a personal account on various Web 2.0 tools as follows: Facebook were 233 (91.7%), WhatsApp were 206 (81.1%) and, Twitter were 190, (74.8%). Table 5.6.5 indicates respondents' personal accounts in the various Web 2.0 tools.



Table 5.6:5 Respondents' personal accounts in Web 2.0 tools

Web 2.0 tools	Frequencies	Percentage
Facebook	233	91.7
WhatsApp	206	81.1
Twitter	190	74.8
GoogleDrive	152	59.8
Blogs	135	53.1
Skype	128	50.4
LinkedIn	111	43.7
YouTube	110	43.3
Dropbox	108	42.5
Google+	90	35.4
Wikis	77	30.3
RSS Feeds	58	22.8
Slideshare	50	19.7
MySpace	46	18.1
Delicious	42	16.5
LibraryThing	38	15.0
Flickr	36	14.2
Podcasts	31	12.2
SecondLife	22	8.7
CiteULike	18	7.1

**Note:** *Multiple responses were allowed*

Few respondents have addressed the complications they are facing in accessing and using various Web 2.0 tools. Others reported that some of the Web 2.0 tools were not user-friendly and assistance was needed to use them. Some of the respondents have admitted using Web 2.0 accounts for their own benefit, not of the library or other work-related programmes they were involved in. Responses were as follows:-

*I agree that majority of us have Web 2.0 accounts especially on simple Web 2.0 tools such as Facebook and WhatsApp however, I think most of us are using them for private issues and most of these accounts are installed or located on our mobile phone.*

And

*I use Web 2.0 tools for chatting and sending videos and photos to friends, but I am also using them to communicate official issues such as training and meeting with my colleagues.*

The study has observed that the majority of the respondents were using mobile devices such as laptop computers, mobile phones (smart phone), iPads and Tablets connected to the various Web 2.0 tools. The study also observed the use of personal Web 2.0 tools such as Facebook and WhatsApp in most of respondents' mobile phones and ipads.

The study has observed few respondents using professional Web 2.0 tools (LinkedIn and Academia .edu) in their official desktop computers. The study observed the availability of official computers connected to the Internet in most of the selected libraries and some of them were located in respondents' offices. The study found computers which were not working. However, they appeared as if they were working.

#### **5.7.2 Websites and Web 2.0 tools in academic libraries**

Respondents were further requested to state if their library had a website and Web 2.0 tools. The study findings showed that most of the respondents, 228 (89.9%) indicated that their library had a website. On the other hand, a quarter of respondents, 72 (28.3%) indicated that their library had at least one type of Web 2.0 tools. Respondents were also asked to indicate if they had used their library's website and the frequency of using the website. The study findings indicated that respondents were not frequent users of their library's website, whereas more than a quarter of the respondents, 81 (31.9%) had used their library's website. Based on the usage of libraries' websites, respondents 27 (16.1%) used their library's website daily. Table 5.6:6 indicates the access of Web 2.0 tools in academic libraries.

Table 5.6:6 Access of Web 2.0 tools in academic libraries

		Frequencies	Percentages
Does your library have a website?			
	Yes	228	89.7
	No	22	8.7
	I do not know	4	1.6
Have you ever used the library website?			
	No	173	68.1
	Yes	81	31.9
How often do you use your library website?			
	Once in a while	27	33.3
	Weekly	25	30.9
	Daily	20	24.7
	Monthly	9	11.1
Does your library have Web 2.0 tools?			
	No	182	71.7
	Yes	72	28.3

The study has observed the availability of websites in some of the selected libraries; however, most of them were not updated for ages. The study observed Web 2.0 tools such as Facebook, Blogs, Social bookmarking, Tagging and Wikis in MUHAS, OUT, SUA and MU Website.

### 5.7.3 The uses of Web 2.0 tools in academic libraries

Respondents were asked to mention the uses of Web 2.0 tools in their libraries. The majority of the respondents, 202 (79.5%) reported using Web 2.0 tools to enhance online communication and sharing, respondents, 194(76.4%) collaboration and participation, and respondents, 176 (69.3%) sharing of research findings. Table 5.6.7 presents the uses of Web 2.0 in academic libraries as mentioned by respondents.

Table 5.6:7 The uses of Web 2.0 tools in the academic libraries

<b>Functionalities</b>	<b>Frequencies</b>	<b>Percentages</b>
Online communication and sharing	202	79.5
Collaboration and participation	194	76.4
Reference services	181	71.3
Scholarly communication	176	69.3
Sharing research findings	175	68.9
Marketing and promotion	174	68.5
Social scholarship	173	68.1
Meet users' information needs	169	66.5
Information literacy training	166	65.4
Knowledge and information sharing	160	63.0
Interaction with users	158	62.2
Cataloguing and classification	154	60.6
Referencing and citations	153	60.2

**Note:** *Multiple responses were allowed*

Further, logistic regression has conducted to determine the access and use of Web 2.0 tools based on the background of respondents. Male respondents were the main user of Web 2.0 tools as compared to female respondents. Both MU and SUZA libraries showed the strongest significant effect ( $p < 0.000^{***}$ ) on the access and use of Web 2.0 tools, followed by UDSM Library ( $p < 0.002^{***}$ ). On the other hand UDOM and SUA libraries showed the strongest access and use of Web 2.0 tools; however, statistically did not show that. Further analysis indicated that administrators showed the strongest significant effect on the access and use of Web 2.0 tools as compared to academicians. Lastly, E-resources and ICT departments were the frequent users of Web 2.0 tools as compared to other departments followed by general circulation department. Table 5.6:8 depicts logistic regression for factors associated with the access and use of Web 2.0 tools in academic libraries.

Table 5.6:8 Logistic regression for factors associated with Web 2.0 access and use

Factors	N	S.E.	Sig.	Exp (B)	95% CI for EXP (B)	
					Lower	Upper
Male	129					
Female	125	0.290	0.819	1.069	0.605	1.888
Age						
21-30	119					
31-40	100	0.899	0.975	0.972	0.167	5.659
41-50	27	0.888	0.709	0.718	0.126	4.094
50+	8	0.943	0.307	0.382	0.060	2.422
Academic library						
ARU	18					
OUT	20	0.610	0.215	2.131	0.645	7.047
MUHAS	15	0.602	0.067	3.010	0.926	9.789
MU	40	0.754	0.000	15.437	3.519	67.712
SUA	31	0.520	0.118	2.256	0.815	6.248
SUZA	14	0.644	0.000	19.648	5.561	69.420
UDSM	71	0.714	0.002	8.960	2.210	36.330
UDOM	45	0.475	0.991	4.470	1.761	11.345
Rank						
Administrators	181					
Academicians	73	0.358	0.991	1.004	0.498	2.024
Department						
General circulation	132					
Collection	82	0.473	0.623	0.792	0.313	2.004
Information studies	9	0.502	0.454	0.686	0.256	1.838
E-resources and ICT	31	0.926	0.431	0.482	0.079	2.965

\*=significant at 0.05; \*\*=significant at 0.01; \*\*\*=significant at 0.01<0.001

On the other hand, only a few academic libraries have reported using Web 2.0 tools for innovative service delivery in their libraries. For example, OUT Library is using Blogs, Twitter and Facebook for marketing and promoting their services and sometimes to communicate with their users. A respondent from OUT reported that:

*This is a distance learning university and most of our users are scattered all over the country thus, the only means of communicating with our users is through Web 2.0 tools.*

And

*Web 2.0 tools are very applicable here because of not only the library which is benefited by them but also the entire university. Our university depends mostly on this Web 2.0 tools to promote their services. We believe that through Web 2.0 tools, information can spread so fast and reach many people within a short time.*

MUHAS Library reported using Social Bookmarking and Tagging, Blogs and Mashups, RSS Feeds, Social networking (Facebook) and Wiki. Respondents from MUHAS Library provide the following responses:

*We are using Wikis to provide information literacy learning in order to familiarise our library users on how to access, retrieve and use library information resources. This is through online training in which we provide links to various topics, online searching strategies, citations and referencing.*

And

*MUHAS Blogs are used to deliver health content, to post announcements such as conferences and training; to market and promote library services such as new arrivals and the likes. In our library, Facebook is used to communicate with our users both socially and academically.*

UDSM Library has reported using only Google Site which is active for the moment. They are having a Facebook account which was not active. Respondents reported that:

*We use a Google Site which we think is enough for the moment to give the update about the library, such as new arrivals, the available e-resources and so on, mainly as awareness on various issues and so on. However, this does not happen in the library as of late.*

And

*I think the purpose of employing Google Site was to enhance communication among users and the library. I cannot fathom the purpose of employing Facebook in this regard.*

SUA Library has reported using Web 2.0 tools to enhance library services. They acknowledged the advantages of various Web 2.0 tools in their libraries, however, they are using Facebook and Google Docs thus far. Respondents from SUA reported that:

*So far we are using Facebook for promotional purposes and Google Docs for sharing information within the library.*

And

*We also created a SNAL Whatsapp group for quick communication among library staff, this is the individual effort and some of the staffs are not in this group due to various reasons including having mobile phones which do not support the application.*

There are few libraries which do not have any Web 2.0 tool; the study found strong notes which prohibit the usage and access of Web 2.0 tools in few of the visited libraries.

## **5.8 The application of Web 2.0 tools for KM implementation**

Web 2.0 Driven SECI Model has employed to support the creation and sharing of knowledge in academic libraries. Thus, respondents were required to state if their libraries apply various types of Web 2.0 tools to enhance KM practices. More than a quarter of the respondents, 41(16.1%) reported on the application of Web 2.0 tools to enhance KM practices in their libraries. Prior to the application of Web 2.0 tools to enhance KM practices in academic libraries, the following sub sections provide the categories of Web 2.0 tools to enhance KM practices through the application of Web 2.0 Driven SECI Model.

### **5.8.1 Categories of Web 2.0 tools to enhance KM practices**

There are various categories of Web 2.0 tools to be utilised to enhance KM practices in academic libraries. Therefore the study findings indicated that half of the respondents, 142 (55.9%) selected Video and audio sharing tools such as YouTube, half of respondents, 135 (53.15%) selected social networking tools such as Facebook, Twitter and MySpace, and one third of respondents, 80(31.49%) selected authorising tools such as Wikis, content management system and content sharing. Table 5.8:1 indicates categories of Web 2.0 tools to enhance KM practices in the academic libraries.

Table 5.8:1 Categories of Web 2.0 tools to enhance KM practices (N=254)

Categories of Web 2.0 tools	Frequencies	Percentages
Video and audio sharing (e.g. YouTube and BBC Player)	142	55.90
Social networking (e.g. Facebook, Twitter and MySpace)	135	53.15
Authoring tools (e.g. Blogs, Wikis, Content sharing and Content Management System)	80	31.49
Personal Networks (e.g. LinkedIn, Academia and Xing)	52	20.47
Audio sharing (e.g. Podcasts)	43	16.92
Social bookmarking (e.g. Google Bookmarks, Delicious and CiteULike)	41	16.14
Productivity applications (RSS Feeds and Tagging)	32	12.59
Image sharing (e.g. Picasa and Flickr)	29	11.41
Interpersonal tools (e.g. Meebo, Apple iChat, Google Talk and Skype)	16	6.29
Sharing Sites (SlideShare, Dropbox and GoogleDocs)	12	4.72
Mashups (e.g. LibraryThing and Google Maps)	08	3.15
Virtual worlds (e.g. Second Life and World of Warcraft)	02	0.78

**Note:** *Multiple responses were allowed*

The application of Web 2.0 tools to enhance KM practices in the majority of academic libraries is still slow and unplanned. None of the respondents interviewed reported on the application of Web 2.0 tools to KM practices in their libraries. However, respondents acknowledged the use of Web 2.0 tools in facilitating KM practices, especially in knowledge sharing. Respondents' responses were as follows:

*Web 2.0 tools such as YouTube is very important in enhancing KM practices because people are able to watch how other people create and share knowledge and therefore be motivated to utilise YouTube for sharing knowledge among others.*

And

*It seems a useful idea but we need training and a lot of workshops to learn how and which Web 2.0 tools can be utilised to enhance KM practices in higher learning institutions.*

And

*Through Web 2.0 tools; professionals can create individual profiles and invite others to contribute; this can help such individuals to know who knows what and therefore put such information in order for other users to update their understanding of the information.*

And



*Web 2.0 tools such as Facebook and Twitter can facilitate knowledge sharing practices within academic communities by connecting people within their departments and institution, and to enhance individual to search for related knowledge for the department or for the institution and provide links which assist individual to retrieve, access and use information.*

## **5.8.2 Knowledge creation and sharing practices through Web 2.0 Driven SECI Model**

The study has employed Web 2.0 Driven SECI Model to explain various activities which could be conducted by library staff to enhance knowledge creation and sharing practices through the application of Web 2.0 Driven SECI Model. Web 2.0 Driven SECI Model is the model which combines SECI processes and Web 2.0 tools such as Facebook, Wikis, Blogs and YouTube.

### **5.8.2.1 Socialisation process**

On Web 2.0 platform, socialisation is conducted when individuals or group share methods, understanding, experience and skills through imitation, practice and participation in different social communities. Using a five-point Likert scale, the findings showed that majority of respondents share methods, understanding, experience and skills through the use of Skype and Wikis (M=4.13), and communicate through VoIP or phone through Google Talk and Skype (M= 4.12). Table 5.8:2 presents knowledge creation and sharing practices under socialisation process.

Table 5.8:2 Knowledge creation and sharing practices under socialisation

<b>Knowledge creation and sharing practices through combination process</b>	<b>Strongly Disagreed</b>	<b>Disagreed</b>	<b>Neutral/ undecided</b>	<b>Agreed</b>	<b>Strongly agreed</b>	<b>Mean value (M)</b>
Sharing methods, understanding, experience and skills through web 2.0 tools e.g. wikis and Skype	7(2.8%)	15(5.9%)	41(16.1%)	125(49.2%)	66(26.0%)	4.13
Communicating through VoIP or phone through web 2.0 technologies e.g. Google talk, Skype etc.	4(1.6%)	13(5.1%)	46(18.1%)	115(45.3%)	76(29.9%)	4.12
Writing and sharing knowledge e.g.by using Skype and Blogs	3(1.2%)	15(5.9%)	52(20.5%)	105(41.3%)	79(31.1%)	3.95
Participating in group discussion in web 2.0 environment e.g. Face book and Blogs	2(0.8%)	13(5.1%)	26(10.2%)	121(47.6%)	92(36.2%)	3.83

Respondents have agreed that they could participate in sharing skills, knowledge and understandings with others through the use of Web 2.0 tools such as Google Docs. They have recommended the establishment of groups which could be registered to Web 2.0 tools (such as Facebook and Google Doc) for sharing and communicating.

### **5.8.2.2 Externalisation process**

The application of Web 2.0 tools facilitates the development of explicit concepts from the tacit knowledge through several modes of representation, including spoken or written words, images, video, and music. Web 2.0 tools such as tagging and instant messaging can be used to support knowledge creation and sharing practices through dialogues and discussions to capture context-rich knowledge when it is being created. Using a five-point Likert scale, the findings showed that majority of respondents capture personal knowledge through Blogs and Wikis (M=4.18), and write and share knowledge by using Skype, Blogs and Wikis (M= 4.05). Table 5.8:3 presents knowledge creation and sharing practices under externalisation process.

Table 5.8:3 Knowledge creation and sharing practices through externalisation process

Knowledge creation and sharing practices through combination process	Strongly Disagreed	Disagreed	Neutral/ undecided	Agreed	Strongly agreed	Mean value (M)
Capturing personal knowledge through web 2.0 tools e.g. Blogs and Wikis	6(2.4%)	15(5.9%)	52(20.5%)	124(48.8%)	57(22.4%)	4.18
Writing and sharing knowledge by using Skype, Blogs and Wikis	1(0.4%)	9(3.5%)	54(21.3%)	121(47.6%)	69(27.2%)	4.05
Recording and watching knowledge discussion through web 2.0 tools e.g. YouTube	0(0.0%)	11(4.3%)	49(19.3%)	110(43.3%)	84(33.1%)	3.98
Organising knowledge and provide a note through Tagging	1(0.4%)	10(3.9%)	45(17.7%)	124(48.8%)	74(29.1%)	3.83

### 5.8.2.3 Combination process

The use of Web 2.0 tools such as Folksonomies and Mashups are good examples of combining and remixing knowledge to form new knowledge for the community. Using a five-point Likert scale, the findings showed that the majority of the respondents make up content through Mashups (combination of more than one Web 2.0 tools such as Blogs and Google Docs) (M=3.87), manage collaborative tags through Folksonomies (M=3.81). Further analysis showed that respondents create and share knowledge resources by RSS Feeds (M= 3.78). Table 5.8:4 presents knowledge creation and sharing practices under combination process.

Table 5.8:4 Knowledge creation and sharing practices under combination process

<b>Knowledge creation and sharing practices through combination process</b>	<b>Strongly Disagreed</b>	<b>Disagreed</b>	<b>Neutral/ undecided</b>	<b>Agreed</b>	<b>Strongly agreed</b>	<b>Mean value (M)</b>
Making up content through Mashups (i.e. combining more than one web 2.0 tools e.g. Blogs and Google Drive)	7(2.8%)	12(4.7%)	56(22.0%)	111(43.7%)	68(26.8%)	3.87
Managing collaboratively tags through Folksonomies	8(3.1%)	12(4.7%)	68(26.8%)	97(38.2%)	69(27.2%)	3.81
Sharing knowledge resources through RSS feeds	7(2.8%)	15(5.9%)	60(23.6%)	116(45.7%)	56(22.0%)	3.78

#### 5.8.2.4 Internalisation process

Web 2.0 tools such as Facebook, Blogs, Tagging and YouTube can be used to facilitate simulation and sharing of best practices, sharing feedback through interaction between people and learning by doing through content editor and co-development. Using a five-point Likert scale, the findings showed that majority of respondents have reported to receive users' feedback through Wikis and Blogs (M=4.05), and to share best practices through Facebook, Skype and Twitter (M=4.01). Further analysis shows that respondents learnt by doing through content editor and co-development through Wikis (M= 3.96). Table 5.8.5 presents knowledge creation and sharing practices under internalisation process.

Table 5.8:5 Knowledge creation and sharing practices under internalisation process

<b>Knowledge creation and sharing practices through combination process</b>	<b>Strongly Disagreed</b>	<b>Disagreed</b>	<b>Neutral/ undecided</b>	<b>Agreed</b>	<b>Strongly agreed</b>	<b>Mean value (M)</b>
Receiving users' feedback through interaction between users by using Wikis and Blogs	5(2.0%)	7(2.8%)	47(18.5%)	107(42.1%)	88(34.6%)	4.05
Reflecting Web 2.0 contents on strategy implement through sharing of best practices through Facebook, Skype and Twitter	6(2.4%)	9(3.5%)	36(14.2%)	128(50.4%)	75(29.5%)	4.01
Learning by doing through content editor and co-development through Wikis	7(2.8%)	11(4.3%)	40(15.7%)	124(48.8%)	72(28.3%)	3.96

## **5.9 Factors that affect the application of Web 2.0 tools to enhance KM practices**

There are several factors which could affect the application of Web 2.0 tools to enhance KM practices. This study employed KMS Success Model to identify those factors. In this study, Web 2.0 tools were regarded as KMS. Therefore, the findings were provided under the following stages.

### **5.9.1 Data screening and examination**

Exploratory Factor Analysis (EFA) was used for data screening and examination. EFA was employed to condense a group of empirical indicators into a small set of factors (latent variables) with a minimum loss of information. In this regard, 254 datasets which were employed in this study was coded and analysed by using SPSS version 21. Z score (standardisation of values) was used to check the presence of outliers whereby 7 items were deleted leaving the final 247 datasets to be analysed.

Correlation of items from visual analysis found that most of the items were highly correlated. Further, Bartlett's test obtained was significant below 0.05. KMO was also calculated whereby the result was 0.84 which is above the limit of 0.6 as according to Hair et al. (2010). Thus, KMO indicated that the items (in 247 datasets) were appropriate for CFA.

### **5.9.2 Measurement model**

The measurement model was employed to represent how measured variables come together to represent constructs. Figure 5.9:1 presents the measurement model as employed in this study.

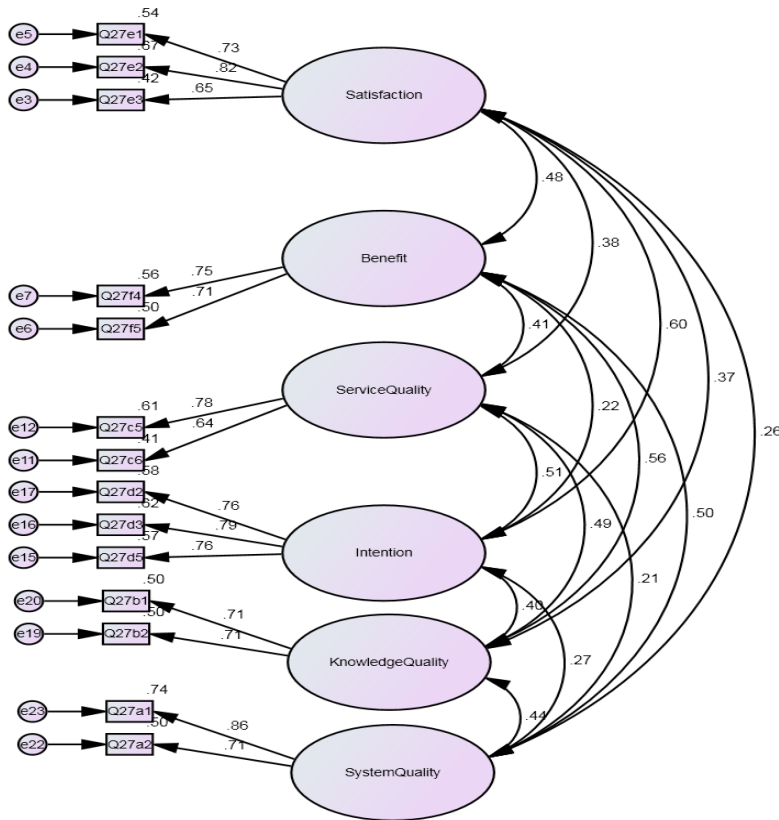


Figure 5.9:1 Measurement model

The first-order CFA was conducted by using AMOS version 23 to test the measurement model. The common six model-fit indices were used to evaluate the overall goodness-of-fit which included chi-squared normalisation by degrees of freedom ( $\chi^2/df$ ); the adjusted goodness-of-fit index (AGFI); the non-normalised fit index (NNFI); the comparative fit index (CFI), the incremental fit index (IFI) and root mean square error of approximation (RMSEA). Table 5.9:1 presents the model fit indices for the measurement model.

Table 5.9:1 Model fit indices for the measurement model

Model fit indices	Recommended values	Measurement model
$\chi^2/df$	$\leq 3.0$	0.946
AGFI	$\geq 0.8$	0.946
NNFI (TLI)	$\geq 0.9$	1.005
CFI	$\geq 0.9$	1.000
RMSEA	$\leq 0.05$	0.000
GFI	$\geq 0.9$	0.968

The measurement model was further assessed for convergent validity of scale items by using reliability, CR and AVE. Reliability of factors was estimated by assessing the Cronbach's alpha and factor loadings from the confirmatory factor analysis. Thus, the Cronbach's alpha coefficients of the all six constructs were 0.6 to 0.8 which indicates that the measurement model used for the study was highly reliable.

Convergent validity was further evaluated by examining the factor loadings from the confirmatory factor analysis. Convergent validity was evaluated by examining the factor loadings from the CFA. In this study, all the factor loadings of the items in the confirmatory factor analysis for the measurement model were greater than 0.5. Thus, all the factors in the measurement model had adequate reliability and convergent validity. Table 5.9:2 presents the result of CFA for the measurement model.

Table 5.9:2 CFA results for measurement model

Item description	M	SD	Factor loadings	$\alpha$
<b>System quality</b>				<b>0.763</b>
23-Web 2.0 tools are easy to use (Usability)	4.30	0.754	0.858	
22-Web 2.0 tools are easy to learn and adapt (adaptability)	4.28	0.742	0.709	
<b>Knowledge quality</b>				<b>0.680</b>
20-Web 2.0 tools provide accurate knowledge for managing library services (accuracy)	4.07	0.754	0.709	
19-Web 2.0 tools provide reliable knowledge for managing library services (reliable)	4.13	0.741	0.707	
<b>Service quality</b>				<b>0.666</b>
12-Web 2.0 tools inspire trust and confidence (assurance) to users	4.09	0.826	0.781	
11-Library provides reliable technical support personnel	4.14	0.760	0.637	
<b>Intention to Use</b>				<b>0.817</b>
17- I will use web 2.0 tools to help me record my knowledge	3.77	0.911	0.762	
16- I will use web 2.0 tools to communicate knowledge with colleagues	3.83	0.959	0.786	
15- I will use web 2.0 tools to create my specific knowledge	3.87	0.901	0.757	
<b>User satisfaction</b>				<b>0.777</b>
5-I am satisfied with Web 2.0 tools efficiency	4.06	0.794	0.733	
4- I am satisfied with Web 2.0 tools effectiveness	4.07	0.796	0.818	
3- I am satisfied that Web 2.0 tools meet my knowledge processing needs	4.12	0.780	0.648	
<b>Net benefits</b>				<b>0.706</b>
7- My performance on the job is enhanced by web 2.0 tools	4.43	0.652	0.749	
6-My performance on the job is enhanced by web 2.0 tools	4.49	0.680	0.705	

Further, the CR and AVE which were also indicators of the convergent validity were conducted. CR was measured by assessing the internal consistency of the measurement model. Table 5.3:21 presents the results of the convergent validity by using CFA.

Discriminant validity was conducted to assess the extent to which a concept and its indicators differ from another concept and its indicators. The study findings indicated that the square root of the AVE was greater than its correlations with all other constructs. Therefore, discriminant validity has been established. The findings also showed that the CR has ranged between 0.6 and 0.8 which shows that the research model can be considered and it had acceptable convergent validity. On the other hand, all the six constructs indicated the AVE of 0.5 and 0.6; therefore, the measurement model in this study had an acceptable AVE. All diagonal values exceeded the inter-construct correlations, and thus, the results confirm that the research instrument had satisfactory construct validity. In addition, CFA measurement



model had adequate reliability, convergent validity and discriminant validity. Therefore Table 5.9:3 presents CR, AVE, and discriminant validity of constructs.

Table 5.9:3 Composite Reliability (CR), Average Variance Extracted and Discriminant Validity of constructs

	<b>CR</b>	<b>AVE</b>	<b>Knowledge Quality</b>	<b>Satisfaction</b>	<b>Benefit</b>	<b>Service Quality</b>	<b>Intention</b>	<b>System Quality</b>
<b>Knowledge Quality</b>	0.668	0.501	0.708					
<b>Satisfaction</b>	0.779	0.542	0.374	0.736				
<b>Benefit</b>	0.692	0.529	0.564	0.477	0.727			
<b>Service Quality</b>	0.671	0.508	0.489	0.383	0.406	0.713		
<b>Intention</b>	0.812	0.590	0.403	0.599	0.224	0.510	0.768	
<b>System Quality</b>	0.763	0.619	0.440	0.259	0.502	0.213	0.272	0.787

### 5.9.2.1 Structural Equation Modelling (SEM)

SEM was employed in this study to explain relationships among multiple variables. Figure 5.9:2 presents the structural model used in this study.

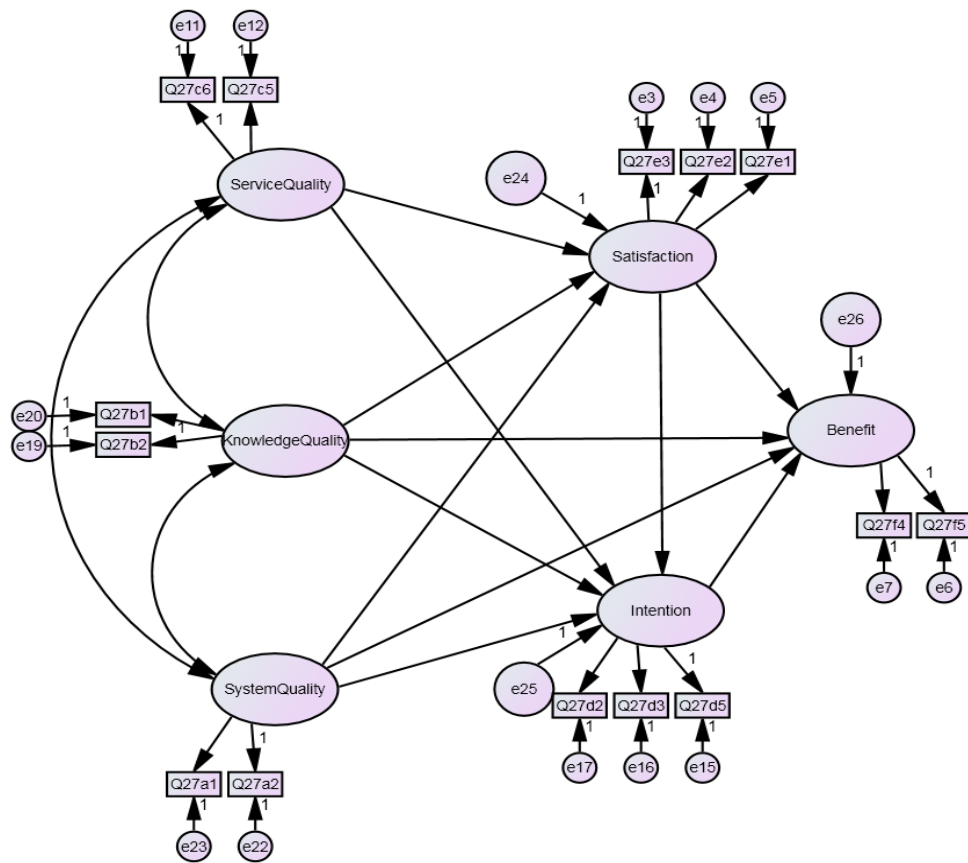


Figure 5.9:2 Structural model

The same set of goodness-of-fit indices was used to observe the structural model. Therefore, Table 5.9:4 indicates the results for the model fit indices for structural model.

Table 5.9:4 Model fit indices for the structural model

Model fit indices	Recommended values	Structural model
$X^2/df$	$\leq 3.0$	1.569
AGFI	$\geq 0.8$	0.915
NNFI (TLI)	$\geq 0.9$	0.949
CFI	$\geq 0.9$	0.964
RMSEA	$\leq 0.05$	0.048
GFI	$\geq 0.9$	0.947

The findings have revealed that there is a large difference between model fit indices of CFA and SEM models; therefore, the model respecification was done basing on the assessment of the modification indices and standard residuals.

#### *Assessment of residual value*

Residual values of above 2.5 were noted. For instance, Q 27f4 – Q27a1 has 4.902. Q 27f4 has values of above 2.5 with other variables. Again Q27f5 also have values of above 2.5 with other items.

#### *Assessment of modification indices*

According to the assessment of net benefits – knowledge quality has a modification indices of 19.9 followed by net benefits – system quality which has the modification indices of 17.05 and net benefits – service quality which has the modification indices of 7.726. Therefore, there is a relationship between net benefits – system quality, net benefits –knowledge quality and net benefits –service quality that may further improve the model. After adding the relationship, SEM the researcher run SEM again to get the fit indices for modified SEM. Figure 5.9:3 presents the modified SEM.

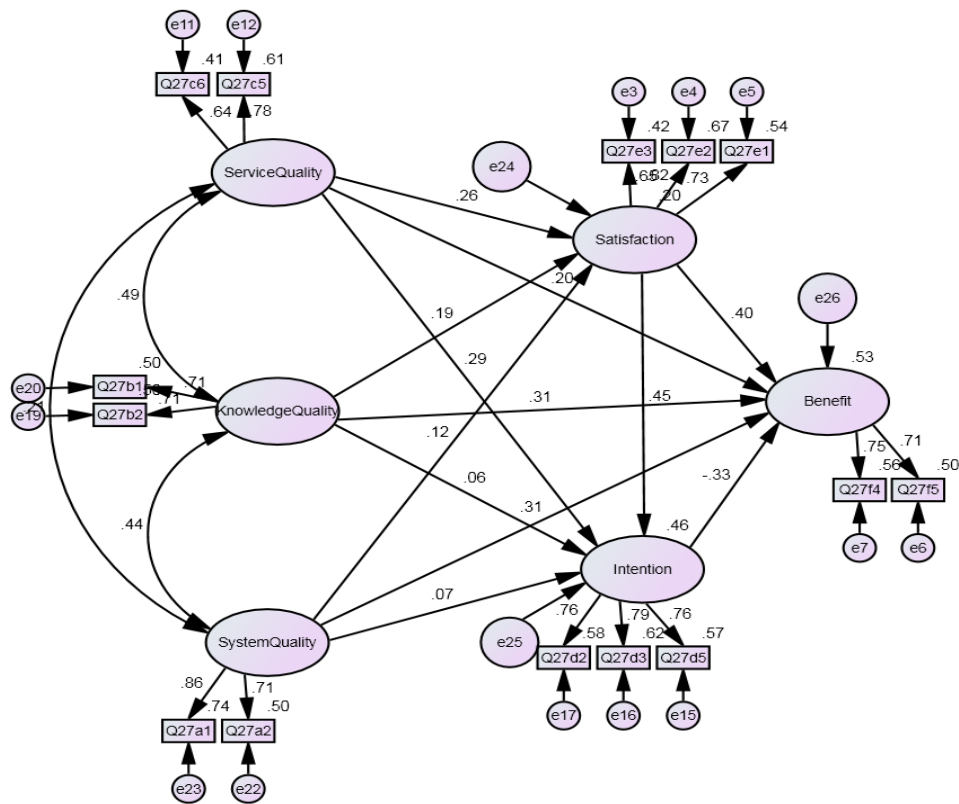


Figure 5.9:3 Modified SEM

On the other hand, the same goodness-of-fit indices were used to observe the modified SEM. Table 5.9:5 presents fit indices for the modified structural model.

Table 5.9:5 Model fit indices for the modified structural model

Model fit indices	recommended values	modified structural model
$X^2/df$	$\leq 3.0$	0.946
AGFI	$\geq 0.8$	0.946
NNFI (TLI)	$\geq 0.9$	1.000
CFI	$\geq 0.9$	1.000
RMSEA	$\leq 0.05$	0.000
GFI	$\geq 0.9$	0.968

When compared the modified SEM and CFA models, the results showed no significant difference between the modified SEM and CFA models. This means that the modified SEM had an excellent model fit as compared to the original model. Thus, the researcher decided to continue with the modified model.

Figure 5.9.3 indicates the SEM results after modification and it showed standardised path coefficients, their significance for the structural model, and the coefficients of determinants ( $R^2$ ) for each endogenous construct. The standardised path coefficient indicated the strengths of the relationships between the independent and dependent variables. In addition, the new relations (H10, H11, and H12) which were suggested by the validated model were assessed. Therefore, in this study, out of twelve hypotheses, seven of them were found significant.

First, service quality had the strongest direct effect on user satisfaction and intention to reuse Web 2.0 tools. Therefore, the hypotheses H1, H4 were supported ( $p < 0.014$  and  $p < 0.003$ ). Further, the study showed that service quality had no significant effect on net benefits. Therefore, hypothesis H10 was not supported ( $P > 0.079$ ).

Second, knowledge quality had no significant effect on user satisfaction and intention to reuse Web 2.0 tools. Therefore, hypotheses H2, H5 were not supported ( $p > 0.105$  and  $p > 0.543$ ). Further, knowledge quality had significant positive influence on net benefits. Therefore, hypothesis H11 was supported ( $p < 0.012$ ).

Third, system quality had no significant effect on user satisfaction and intention to reuse Web 2.0 tools. Thus, hypotheses H3, H6 were not supported ( $p > 0.194$  and  $p > 0.413$ ). Further, the study findings showed that system quality showed the strongest direct effect on net benefits. Therefore, hypothesis H12 was supported ( $p < 0.001$ ).

Fourth, user satisfaction had a significant positive effect on intention to reuse the system (Web 2.0 tools) and net benefits. Therefore, hypotheses H7,H8 were supported ( $p<0.000$ ) and ( $p<0.000$ ).

Lastly, the study findings showed that the intention to reuse Web 2.0 tools had a significant effect on net benefits. Thus, the hypothesis H9 was supported ( $p<0.006$ ). Table 5.9:6 indicates hypotheses testing results.

Table 5.9:6 Hypotheses testing results

Hypotheses	Path	P value	Decision
H1	Service quality → Uses satisfaction	.014	SUPPORTED
H2	Knowledge quality → Uses satisfaction	.105	NOT SUPPORTED
H3	System quality → Uses satisfaction	.194	NOT SUPPORTED
H4	Service quality → Intention to reuse	.003	SUPPORTED
H5	Knowledge quality → Intention to reuse	.543	NOT SUPPORTED
H6	System quality → Intention to reuse	.413	NOT SUPPORTED
H7	User satisfaction → Intention to reuse	.000	SUPPORTED
H8	User satisfaction → Net benefits	.000	SUPPORTED
H9	Intention to reuse → Net benefits	.006	SUPPORTED
H10	Service quality → Net benefits	.079	NOT SUPPORTED
H11	Knowledge quality → Net benefits	.012	SUPPORTED
H12	System quality → Net benefits	.001	SUPPORTED

### 5.9.3 The direct, indirect and total effect of the variables depicted

The direct, indirect and total effect of system quality, knowledge quality and service quality on user satisfaction, intention to reuse and net benefits were conducted. The findings revealed that user satisfaction had the strongest direct effect on intention to reuse Web 2.0 tools in academic libraries. Among the three quality-related constructs, service quality had the strongest total effect on intention to reuse Web 2.0 tools. Further, service quality had the strongest effect on net benefits, whereas knowledge quality had the largest effect on net benefits. Table 5.9:7 depicts the direct, indirect and total effects of the variables.

Table 5.9:7 The direct, indirect and total effect of the variables depicted

	Direct effect			Indirect effect			Total effects		
	User satisfaction	Intention to use	Net benefit	User satisfaction	Intention to use	Net benefit	User satisfaction	Intention to use	Net benefit
System									
Quality	0.235	0.473	0.068		0.202	0.605	0.235	0.187	0.055
Knowledge									
Quality	0.146	0.607	0.034		0.214	0.453	0.146	0.244	0.020
Service									
quality	0.008	0.006	0.095		0.010	0.949	0.008	0.000	0.109
User									
satisfaction		0.001	0.007					0.023	0.008
Intention									
to use			0.008						
Net									
benefit									

### 5.10 Challenges that hinder the application of Web 2.0 tools to enhance KM practices

There are many challenges which face the academic communities these days. Among them, there are those that hinder the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania and in Africa in general. The following sub-sections present challenges that hinder the application of KM practices, as well as those that hinder the application of Web 2.0 tools to enhance KM practices in academic libraries.

#### 5.10.1 Challenges that hinder the application of KM practices in academic libraries

Respondents were required to indicate the challenges that hinder the application of KM practices in academic libraries. Using a five-point Likert scale, the findings showed that majority of the respondents lacked management support (M=4.37). Further analysis has showed that library staff and their libraries lack the time and some of them ignored the KM practices movements in their libraries (M=4.33), lack of KM policy and procedure manual (M=4.33), and lack organisation culture and sufficient funds (M=4.31). Table 5.10:1 indicates the challenges that hinder the application of KM practices.

Table 5.10:1 Challenges that hinder the application of KM practices in academic libraries

Challenge	Strongly Disagree	Disagree	Neutral/ undecided	Agree	Strongly agree	Mean value (M)
Lack of management support	2(0.8%)	7(2.8%)	25(9.8%)	99(39.6%)	121(47.6%)	4.37
Lack of time and ignorance	7(2.8%)	17(6.7%)	32(12.6%)	115(45.3%)	82(32.3%)	4.33
Lack of KM policy and guidelines	0(0.0%)	6(2.4%)	19(7.5%)	104(40.9%)	125(49.2%)	4.33
Lack of organisational culture	3(1.2%)	4(1.6%)	19(7.5%)	109(42.9%)	119(46.9%)	4.31
Lack of insufficient fund	3(1.2%)	6(2.4%)	24(9.4%)	92(36.2%)	129(50.8%)	4.30
Lack of motivations	1(0.4%)	8(3.1%)	20(7.9%)	108(42.5%)	117(46.1%)	4.28
Lack of skills and knowledge	5(2.0%)	10(3.9%)	18(7.1%)	96(37.8%)	125(49.2%)	3.37

### 5.10.2 Challenges that hinder the application of Web 2.0 tools to enhance KM practices

Respondents were also required to indicate the challenges that hinder the application of Web 2.0 tools to enhance KM practices in academic libraries. Using a five-point Likert scale, the findings showed that majority of the respondents were not awareness of the KM practices (M=4.40), and unreliable internet connection (M=4.39). Further analysis showed that the majority of the respondents reported the lack of security and privacy in most of Web 2.0 tools (M=4.38), inability to master technology-same old excuse (M=4.37), and poor ICT infrastructure (M=4.28). Table 5.10:2 presents challenges that hinder the application of Web 2.0 tools to enhance KM practices in academic libraries.



Table 5.10:2 Challenges that hinder the application of Web 2.0 tools to enhance KM practices

Challenge	Strongly Disagree	Disagree	Neutral/ undecided	Agree	Strongly agree	Mean value (M)
Lack of awareness of the values of the usage of Web 2.0 tools in academic activities	2(0.8%)	4(1.6%)	18(7.1%)	97(38.2%)	133(52.4%)	4.40
Unstable internet connection	3(1.2%)	4(1.6%)	15(5.9%)	105(41.3%)	127(50.0%)	4.39
Lack of security and privacy	5(2.0%)	9(3.5%)	34(13.4%)	102(40.2%)	104(40.9%)	4.38
Inability to master technology – “same old excuse”	1(0.4%)	8(3.1%)	21(8.3%)	113(44.5%)	111(43.7%)	4.37
Poor ICT infrastructure	0(0.0%)	6(2.4%)	16(6.3%)	99(39.0.7%)	133(52.4%)	4.28
Lack of reliable power sources	2(0.8%)	7(2.8%)	18(7.1%)	91(35.8%)	136(53.5%)	4.21
Ignorance	6(2.4%)	11(4.3%)	30(11.8%)	104(40.9%)	103(40.6%)	4.14
Learning new tools not given priority	3(1.2%)	9(3.5%)	21(8.3%)	120(47.2%)	101(39.8%)	4.13

Few respondents have reported insufficient funds for the proper application of KM practices, ignorance and lack of motivation to participate in KM practices being the challenges. They also reported on the lack of knowledge repositories to minimise the loss of knowledge and lack of KM systems to enhance the flow of knowledge from one place. Respondents also reported on the lack of time, fund and expertise to facilitate the application of KM practices in the academic libraries.

*I guess it could be due to lack of time to manage such services although expertise may not be a problem now since the majority of the librarians are aware of such tools.*

And

*The use of Web 2.0 tools such as Facebook and Blogs are strictly forbidden here, no one is allowed to use any of Web 2.0 tools for whatever purposes.*

And

*Lack of skills and knowledge is the main problem for many of us, therefore we need to attend training and workshops regularly on how to apply and use Web 2.0 tools in order to facilitate the application of KM practices in our libraries.*

And

*Lack of management was reported as among the critical problem facing most of the academic libraries. I think the first thing to ensure before the proper commencement of KM practices is to seek for management support.*

And

*The challenge which is facing most academic libraries is where and how they can get knowledge managers and/or knowledge experts who can apply KM practices in such libraries. It is also not clear on how libraries can shift from information management to knowledge management. Lack of KM tools and KMS to enhance KM practices was also observed in the majority of the academic libraries in Africa. Therefore, KM application process might take time if such challenges could not be addressed.*

And

*The problem which most academic libraries here in Tanzania have is the lack of policy and budget for implementing KM concepts. Therefore we need to work up to make sure that these two issues are in place before thinking of KM application in our academic libraries.*

Respondents also report that people might not be aware if Web 2.0 tools could be used to enhance KM practices. They think Web 2.0 tools are only for socialising and are made for young people. Although the majority of respondents were of opinion that Web 2.0 tools would be very useful in their libraries, it was very interesting to note the reasons provided by some respondents who stated that Web 2.0 tools could never be applied in academic libraries. Other respondents reported that the application of Web 2.0 tools in academic libraries is very slow.

There are few libraries which do not have any Web 2.0 tool. This study observed strong notes which prohibit the usage and access of Web 2.0 tools in few of the visited libraries. The study also observed the

use of personal Web 2.0 tools' accounts such as Facebook and WhatsApp among respondents through their mobile phones and ipads. In addition, the study observed few respondents who were using professional Web 2.0 tools such as LinkedIn and Academia .edu through their official desktop computers.

In addition, the study has observed a number of challenges on the application of Web 2.0 tools to enhance KM practices. The study observed the lack of electricity in most of the selected libraries, and the majority of such libraries do not have standby generators. The study has observed low Internet connectivity in the majority of the selected libraries.

### **5.11 Chapter summary**

Chapter Five have dealt with the analysis and interpretation of the results. The findings have presented according to the research objectives. During the analysis and interpretation of results, the researcher made constant reference to Chapter Three on literature review and Chapter Four on research methodology. The overall results indicated that respondents were aware of KM practices; however, the application of KM practices in the majority of academic libraries was still low. Despite the benefits of KM practices in the majority of academic libraries, KM enablers have to be employed to facilitate the application of KM practices. Among the KM enablers mentioned, competencies and skills were selected by the majority of respondents.

The majority of the respondents have reported that they had more than one Web 2.0 accounts. However, the access and use of Web 2.0 tools in the majority of the selected libraries are still low and unplanned. Knowledge Creation Model (SECI processes) was used to explain the creation and sharing of knowledge. On the other hand, Web 2.0 Driven SECI Model was used to explain the creation and sharing of knowledge under the light of Web 2.0 tools. KMS Success Model was used to investigate factors affecting the application of Web 2.0 tools to enhance KM practices. Six constructs: service quality, system quality, knowledge quality, intention to reuse, user satisfaction and net benefits were integrated to explain the application of KMS Success Model in this study. Among the critical challenges mentioned that hinder the application of Web 2.0 tools to enhance KM practices include unreliable power supply, low internet connectivity, insufficient funds, inadequate ICT infrastructure and lack of training and low motivation to library staff.

## **CHAPTER SIX**

### **INTERPRETATION AND DISCUSSION OF RESEARCH FINDINGS**

#### **6.0 Introduction**

Chapter Six interprets and discusses the findings that are presented in Chapter Five. Creswell (2009:153) asserts that this section of the thesis enables the researcher to report on how the results answered the research questions. Relevant literature and other similar study findings obtained were used to interpret and discuss these findings. Leedy and Ormrod (2001) present the following steps to be followed during interpretation and discussion of the study findings:-

- (a) Tying the findings to the rationale of the research, that is, the questions and objectives;
- (b) Tying the findings to what is already known, for example, what was discussed in the literature review, to either confirm or deny this common knowledge;
- (c) Establishing the practical value and/or usefulness of the research and its findings; and
- (d) Establishing the limitations or weaknesses of the study.

As explained in section 1.5 of Chapter One, the overall aim of this study was to investigate the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania. Therefore, the study findings are presented according to the specific objectives of the study as outlined in Chapter One Sub-Section 1.5.1.

#### **6.1 Background of respondents**

Background of the respondents was provided to get some information about the respondents participated in this study. However, the background of the respondents was not among the specific objectives but is relevant for interpreting and discussing the study findings. According to Lwehabura (2007), the background of the respondents proves the confidence on the part of the researcher regarding the reliability of their responses. In this study, the background of respondents includes gender, age, job location, rank and department were considered. Age was considered among the factors that influence the application of Web 2.0 tools and KM practices (Mtega et al. 2014). Half of the respondents participated in the survey were aged between 21 and 30 years; while those who participated in semi-structured interviews were between 41 and 50 years.

The first group of between 21 and 30 years was more supportive due to the fact that they were born after the onset of computer technology, hence making them technology savvy; therefore, they could easily access and use Web 2.0 tools for their daily duties. On the other hand, the second group of between 41 and 50 years were considered as decision makers; therefore, they could facilitate the application of Web 2.0 tools to enhance KM practices in academic libraries. This category has relatively middle-aged or elderly people who could suggest various on the ways of integrating and utilising Web 2.0 tools in academic libraries, as well as, decide on the measures to be employed to enhance the application of Web 2.0 tools in the academic environment.

Gender of respondents has been included to ensure that both genders participated in this study, and also to note group is behind the other on using Web 2.0 tools to facilitate KM practices. This will also help such group to be motivated to employ Web 2.0 tools for KM practices. Further, the gender of respondents may result in different knowledge and ideas about the access and use of Web 2.0 tools and application of KM practices in academic libraries (Mtega et al. 2014). More male respondents participated in this study. The similar findings were obtained from a study conducted by Mtega et al. (2014). Therefore, female respondents need to be encouraged to access and use Web 2.0 tools to enhance KM practices as well as to improve their daily activities.

Job location was used to indicate which academic library and/or departments' the respondent is working. Respondents were also required to indicate their professional positions/ranks to help a researcher to determine the activities conducted by each respondent. Therefore, the use of background of respondents provides a bottom for investigating the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania at the different horizon.

## **6.2 KM awareness among respondents**

One-third of respondents 82 (32.3%) were aware of KM concepts. KM awareness among library staff working in the academic libraries is still low due to various reasons. Islam, Agarwal, and Ikeda (2014) suggest that the majority of the library staff had heard KM concept in some forms; however, they did not take them seriously. The study findings observed that the majority of the academic libraries are practising some components of KM in one way or another, knowingly or unknowingly. Nazim and Mukherjee (2011) assert that the term 'KM' is familiar to the most of the librarians but the ways of knowing and degrees of their understanding are varied.

The study findings have provided the need for KM training and KM training programmes/modules to increase the level of KM awareness and understanding among library staff. Despite the low level of KM awareness among library staff, 112 (44.1%) respondents reported having obtained some forms of KM training. Out of 112 (44.1%) respondents who obtained KM training, two-fifths 45(40.17%) respondents obtained KM training through self-studies such as literature, library resources, audio, and video programmes. Siddike and Islam (2011) indicate that 93% of respondents have heard KM from KM literature. Islam, Agarwal, and Ikeda (2014) suggest that a self-study is among the good efforts of obtaining KM skills; however, it might be among the reasons for low uptake of KM in academic libraries.

On the other hand, KM formal training programmes such as certificates, degrees, masters, and PhD need to be introduced to increase the level of KM awareness among library staff worldwide. Library staff could also be encouraged to attend various KM seminars, training, and workshops on a regular basis. This will help them to gain more skills and knowledge to deal with KM practices in their libraries. Wen (2005) reports that KM concept is a very new concept especially for library staff who attended LIS before 1990s, therefore, KM seminars, training, and workshop could help them to obtain more KM skills and knowledge. Mostofa and Mezbah-ul-islam (2015:51) add that professional education and training programs, the community of practices, IT skills, and knowledge sharing should also be considered among the important tools for KM application in academic libraries. Additionally, KM training could also be obtained online through Web 2.0 tools, social media tools, Google search, and blended learning.

### **6.3 The application and benefits of KM practices in academic libraries**

The application and benefits of KM practices in academic libraries are still slow and unplanned as indicated by literature. The study findings have indicated that only one third (1/3), that is, 83 (32.7%) respondents were applying KM practices in their libraries. Similar observation was noted from a study done by Jain (2013) which reveals that 60% of the libraries she investigated were applying KM; however, some of them did not seem to be practising KM fully.

Logistic regression findings have indicated that male respondents were applying KM practices. Despite the big number of female respondents observed in the majority of the visited libraries, they were busy with other library duties; while male respondents were observed doing KM activities such as cataloguing and classification, CAS, SDI, attending users' queries and borrowing and returning of books were KM practices. On the other hand, the study findings have observed that the majority of male respondents managing managerial positions/posts such as directors and heads of libraries departments/section. This

might indicate that male respondents seem to be more educated than female respondents in the academic libraries.

Further, administrative staff showed the highest level of KM application in the majority of the academic libraries. This is due to the fact that most of the KM activities are performed by administrative staff; while academic staff participating in the creation and sharing of knowledge through teaching, learning, research, and innovation. On the other hand, ICTs and e-resources departments showed the highest level in applying KM practices in the most of the visited academic libraries. This is observed that such departments could lead and facilitate the application of Web 2.0 tools to enhance KM practices in the majority of academic libraries. Thus, it is believed that ICTs and e-resources departments need to be empowered to support the installation and utilisation of Web 2.0 tools in academic libraries worldwide.

Lack of the knowledge on what KM practices bring to the academic community continues to affect the majority of the academic libraries worldwide. Therefore, the benefits and values of KM practices in the academic libraries need to be identified and documented. Academic libraries need to identify knowledge expertise existing within individuals working in academic institutions. Knowledge expertise in this study is defined as the specialised skills in specific subjects existing among individuals.

Further, libraries' effectiveness and efficiency, productivity, and profitability could be enhanced through knowledge expertise among employees, and then shared for the benefit of the entire academic community. The importance of knowledge expertise is to store intellectual assets for employees and make the effective use of such assets for the benefit of the entire academic community. Lee (2000) asserts that knowledge expertise among the library staff needs to be treated as intellectual assets. Daneshgar and Bosanquet (2010) add that there is a vast amount of knowledge existing within librarians which can be used to help library users to solve their academic problems. Such knowledge needs to be identified and preserved to solve library users' needs.

Academic libraries also need to employ systems to identify expertise in the academic libraries and institutions. Identification of knowledge expertise helps academic libraries to position their staff to appropriate workstations based on their specialities. When employees are positioned in the sections or divisions which are not in accordance to their best potential, they may not perform up to their optimum competence. For example, knowledge expertise in cataloguing may not be immediately intuitive in archiving or referencing section and vice versa (Townley 2001).

In addition, Raja, Ahmad, and Sinha (2009) suggest different types of knowledge expertise existing among library staff as follows:-

- (a) Knowledge about library's information sources for assets, products and services;
- (b) Knowledge about where these sources are stored and their usage;
- (c) Knowledge about users including teaching staff, researchers, students and any other stakeholders;
- (d) Knowledge about what is the current usage of these sources and how to increase their usage;
- (e) Creativity and ability to learn and adapt new technologies to provide better services and ability to create, share, harness and utilise knowledge;
- (f) Understanding of the knowledge creation process and impact of knowledge;
- (g) Information literacy skills, creating, finding, sharing and using information and knowledge; and
- (h) Understanding of the principles of organisation of knowledge and how to manage it for better flow and utilisation.

KM practices help academic libraries to improve their services and productivity. Studies done by Jantz (2001), Jain (2012), Jain (2015), Mavodza and Ngulube (2012), Maponya (2003), Mostofa and Mezbah-ul-islam (2015), and Townley (2001), provide information regarding the benefits of KM practices are in to improve library services to better serve the library users. Indeed KM practices help academic libraries to improve their services such as assisting users in information/knowledge needs, ensuring proper arrangement of library materials, and enhancing capacity building among library staff (Jain 2015; Mostofa and Mezbah-ul-islam 2015).

Townley (2001) adds that KM practices help academic libraries to develop and apply the organisational knowledge needed to improve operations and ultimately library effectiveness. The study done by Mavodza and Ngulube (2012) found out that Metropolitan College of New York (MCNY) Library activities were not deliberately informed by KM principles, but were amenable to KM principles. In addition, academic libraries need to ensure the application of KM practices to improve the quality of their services to satisfy the users' information needs.

KM practices help academic libraries to establish Knowledge Repositories (KR) to captures, organise as well as to categorise knowledge-based information. KR is defined as a progressive knowledge database system which is generated within a library from the interaction between library staff, library users and library systems to capture, organise and categorise knowledge to enhance easy access, retrieve and use (Hislop 2013; Jain 2009; Jain 2012; White 2004).



The study has observed a lack of KR in the majority of the visited libraries. Instead, the study observed the availability of Institutional Repositories (IR) in the following libraries: MUHAS Library which has an IR to store theses, dissertations, conference papers and research reports, MU Library has an IR known as Mzumbe University Institutional Repository (MUIR) used to store theses, dissertations and published articles. OUT has an IR which is used to store theses, dissertation and other reports. SUA Library has two repositories which are Sokoine University of Agriculture Institutional Repository (SUAIR) is used to store dissertations, theses and published articles and TacciRe, a special IR to store climate change articles.

The study has provided that academic libraries should differentiate the functionalities of KR and IR. KR and IR are not the same in terms of functionalities. The study done by Jain (2013) found few academic libraries with central KR, while others have online systems LibStats system, intranet, DSpace and IR to capture the internal knowledge of their staff. The main aim of establishing KR is to store and maintain knowledge within the organisation, as well as, to enhance the flow of knowledge from one point to another.

KR is also considered as a benchmark of digital scholarship (Jain 2009). KR is very important for academic libraries which apply KM practices especially knowledge creation process (Rowley 2000). KR is used to store explicit knowledge within the institution. This is because such knowledge can easily be documented and organised for access and thus minimise the loss of knowledge through downsizing and/or turnover (Hislop 2013). Academic librarians have the mandate to establish KR to store the knowledge created within the academic institutions. Despite the fact that IT expertise is needed to configure and install IR; librarians are more responsible for ensuring KR is working well in terms of adding knowledge as well as accessing, retrieving and using such knowledge. Townley (2001) adds that librarians are familiar with the creation and maintenance of the KR as well as to train their users on how to access, retrieve and the use of the knowledge in the KR. Further, White (2009) suggests that library staff must be a part of the implementation of KR within their institutions.

KM practices facilitate the establishment and enhancement of knowledge innovation within the academic libraries. Herkema (2003) defined knowledge innovation as a process which knowledge is acquired, shared and assimilated with the aim of creating new knowledge. In this study knowledge innovation comprises the processes used to create and share knowledge within the academic institutions.

Gloet and Terziovski (2004), as well as Roknuzzaman and Umemoto (2009), provide a link between KM and innovation which describes KM as a process that is used to identify the knowledge that creates new capabilities to enable superior performance, encourages innovation, and enhances customer experience. A number of studies provide the advantages of KM practices in enhancing innovation and organisational performance (Darroch and McNaughton 2002; Adams and Lamont 2003; Du Plessis 2007), and in academic libraries setting (Scupola and Nicolajsen 2010; Sheng and Sun 2007; White 2001). Further, KM practices enhance knowledge innovation in academic libraries through generating new ideas, exploiting organisation's thinking power, and capturing insight and experience among employees (Darroch and McNaughton 2002; Adams and Lamont 2003; Du Plessis 2007).

KM is not solely focused on knowledge innovation, but it creates an environment conducive for such innovation to take place (Cavusgil, Calantone, and Zhao 2003; Du Plessis 2007). Cavusgil, Calantone, and Zhao (2003), and Du Plessis (2007), add that among the major drivers of knowledge innovation in KM practices is to enhance codification and sharing of tacit knowledge. KM practices assist in converting tacit knowledge to explicit knowledge by providing platforms as well as processes for capturing and ensuring that tacit knowledge becomes explicit (Cavusgil, Calantone, and Zhao 2003; Du Plessis 2007). Codification is regarded as among the products of knowledge innovation which facilitate the transfer of knowledge from people to documents (Hislop 2013:57). Codification process is currently facilitated by the application of technological tools such as Web 2.0 tools and social media tools. Other examples of codification platforms include discussion databases and online collaborative communities of practice.

On the other hand, KM practices assist organisations to create an environment which enhances the creation, sharing and leverage of tacit knowledge. For example, the creation of communities of practice that require attention from the organisation (Du Pless 2007). Knowledge innovation also provides other platforms and processes for tacit knowledge sharing such as breakfast briefings through the electronic forms where the knowledge can be organised and retrieved for later use (Pearson and Saunders 2009). In addition, the tacit knowledge could also be transferred and communicated through mentoring or apprenticeship programs (Pearson and Saunders 2009).

Knowledge innovation enhances the creation and storage of the explicit knowledge within the academic institutions. Du Plessis (2007) adds that explicit knowledge features are quite strong in the research and development process with a rich exchange of tacit knowledge. It is, therefore, important for academic institutions to build resources and capabilities that will allow them to capture and codify knowledge, as well as, product development routinely to ensure knowledge exchange and transfer (Cardinal, Allesandri,

and Turner 2001; Scarbrough 2003). According to Du Plessis (2007), KM practices play a significant role in making explicit knowledge available for recombination into new and innovative ideas which include the following:-

- (a) KM practices provide tools, processes and platforms to ensure knowledge availability and accessibility through structuring of the knowledge base;
- (b) KM practices ensure that explicit knowledge (which can be used as input to the innovation process), is gathered internally and externally; and
- (c) KM practices provide the means to ensure the leverage of knowledge and to determine the gaps in the explicit knowledge base of an organisation that could potentially negatively impact the organisation's innovation program.

Knowledge innovation is also used to facilitate collaboration under the umbrella of KM practices. According to Du Plessis (2007), collaboration is used to foster knowledge innovation through the provision of technological platforms and tools to support knowledge sharing in academic institutions. Hislop (2013:155) adds that collaboration facilitates the establishment of communities of practice which is associated with the practice-based perspective on knowledge. Additionally, the knowledge which people have is embedded in and inseparable from the (collectively based) activities that they carry out (Hislop 2013).

KM practices help academic libraries to establish best practices. Best practices in this study include all the activities which are conducted to ensure library users are satisfied with the quality of services offered in such libraries. Thus, academic libraries should continuously look for best practices to serve the needs of the entire academic community. The best practices are time and cost-effective; thus, academic libraries need to provide operational excellence so as to enhance performance and competitive advantage. However, there is no practice which is best for everyone, and there is no best practice which remains best forever (Jain 2013; White 2004).

In addition, best practices could be performed if there is teamwork among library staff. Senior library staff needs to work closely with senior library staff and users to ensure best practices are performed. Through teamwork, library staff should deliver more appropriate and timely services towards users' satisfaction. Hayes (2004) adds that "librarians are seeing their roles as working with faculty and students, technologists and learning and teaching specialists to create new service models and new ways of all working in a KM environment a role, which we are eminently qualified to fulfil".

Jain (2015) asserts that KM provides academic libraries with numerous opportunities to rise from stereotype status and change their service delivery approach by establishing new alliances with students, academic staff, and researchers to create a customer-centred environment. Academic libraries, therefore, need to restructure their functions and expand their roles and responsibilities to effectively contribute to a large and diverse university community (Mostofa and Mezbah-ul-islam 2015).

KM practices support the management of information overloads in academic libraries. Information overload is defined as the rapidly increasing amount of information and consequently availability of more information/knowledge to everyone (Jain 2013; Mostofa and Mezbah-ul-islam 2015). Mostofa and Mezbah-ul-islam (2015) suggest that managing information explosion is among the benefits of KM in libraries. Therefore, KM practices help academic libraries to manage and to organise information to allow easy retrieve, access and use of information.

Jain (2013) adds that academic institutions create new knowledge daily through teaching, learning, research and innovation. On the other hand, most of the academic libraries are currently in a state of information overload and decay of existing knowledge, which is continuously replaced by new knowledge created every hour. It is also reported that information overload in the most of the academic libraries creates difficulties for library users to locate, retrieve and use information to solve their academic problems (Jain 2013). New information and knowledge are generated faster than ever before in higher learning institutions especially in this age of science and technology (Mosha, Holmner, and Penzhorn (2015).

In addition, Jain (2013) provides that human knowledge in higher learning institutions is doubled in every thirty two hours. This means that there is more information created every day and therefore its management might be difficult due to lack of KM practices in place. On the other side, library staff will not be able to digest reliable information for their library users; and the situation might be worsened by limited financial resources; only the application of KM practices could solve the problem. Jain (2013) suggests that the core of the most of the academic libraries is to ensure information repackaging and information customisation so as to manage information explosion. Therefore, there is a need for academic libraries to ensure that reliable information is selected and stored in a good way which will allow its access, retrieve and use.

KM practices help academic libraries to develop corporate memory. The similar finding was obtained by the studies done by Abram (1997), Cates (2001), Choo (2000), Hayes (2004), Perez (2002), Todd and Southon (2001), and Townley (2001) which provide that KM practices facilitate the development of corporate memory within higher learning institutions. The concept of corporate memory refers to the collection of both tacit and explicit knowledge (processes and products) in the organisation, which are worth sharing and preserving for later re-use (Abram 1997; Choo 2000; Hayes 2004; Koina 2003; Perez 2002; Todd and Southon 2001; Townley 2001).

Hayes (2004), as well as Koina (2003), mention the roles of library staff to ensure the corporate memory in academic libraries which are:-

- (a) To conduct an information and knowledge audit which involve an identification of information and knowledge needs of the organisation and the resources and services currently provided to meet these needs; mapping of information flows within the organisation and between an organisation and its external environment; analysis of gaps, duplications, inefficiencies and areas of over-provision which enables the identification where changes are needed;
- (b) To develop information and knowledge databases such as expert databases and KR; and
- (c) To utilise a combination of technologies such as the intranet and groupware for speedy information access and dissemination.

Abram (1997) adds that corporate memory refers to the transformation of librarianship that involves creating and enhancing knowledge within the environment. It is, therefore, reported that each organisation's corporate memory is unique (Todd and Southon 2001; Townley 2001). Therefore, academic libraries need to have structures to organise and retrieve knowledge from the corporate knowledge base, so as to provide a unique context to each particular organisational knowledge base (Cates 2001; Hayes 2004; Koina 2003; Perez 2002).

#### **6.4 KM enablers for the application of KM practices**

KM enablers such as competencies and skills, organisational culture, IT supports, management supports, incentives, and trust are very critical for the application of KM practices in the academic libraries. KM enablers are mechanisms employed to help an organisation to develop its knowledge, as well as, to stimulate the creation and sharing of knowledge (Grotenhuis and Weggeman 2002; Hall 2002; Lee and Choi 2003; Yeh, Lai and Ho 2006). On the other hand, KM enablers motivate employees to participate in KM practices within their organisations.

The study findings have reported the importance of competencies and skills to enhance the application of KM practices among respondents. Mosha, Holmner, and Penzhorn (2015) explain the importance of competencies and skills to enhance KM and KS in higher learning institutions. On the other hand, Morris (2001) adds that LIS professionals have the essential theoretical and practical skills to work with KM practices. Thus, library staff needs to be encouraged to obtain skills and knowledge required for the application of KM practices in their academic libraries. Chandra (2005) suggests the following competencies and skills which library staff needs to obtain for the application of KM practices:-

- (a) An understanding of organisational culture and group dynamics and how organisational behaviours such as trust and respect might affect knowledge exchange in the workplace;
- (b) An ability to manage the changes necessary to move towards a more knowledge-aware organisation culture;
- (c) Superior communication skills and ability to lead, influence and empower;
- (d) An understanding of the capabilities and limitations of information technology and telecommunications as tools for knowledge exchange and collaboration;
- (e) An understanding of knowledge-seeking behaviours and the ways people convert information into knowledge; and
- (f) An understanding of how best to support learning at work.

KM policy and guidelines are among the KM enablers for the application of KM practices in academic libraries. The study findings have revealed the lack of KM policy and guidelines among the visited academic libraries. Similar findings were obtained from the studies done by Jain (2007), Parirokh, Daneshgar, and Fattahi (2008), and Nawe (2003), which add the lack of the KM policy in the majority of the academic libraries worldwide. Maponya (2004) adds that most of the academic libraries lack the written KM policy. Despite the fact that KM policy and procedures are used to guide the implementation of KM practices in the academic libraries, the library staff efforts to ensure such and implementation are still very low and unplanned (Jain 2007; Parirokh, Daneshgar, and Fattahi 2008; Nawe 2003). This study has reported that the absence of KM policy might hinder the application of KM practices in academic libraries.

Jain (2007) adds that KM policy is regarded as an indicator to guide library staff to perform their duties effectively and efficiently. Despite the lack of KM policy in the most of the visited academic libraries; the study has observed the existence of library policies in ARU and MUHAS Libraries, as well as, MUIR

policy in MU Library. The study has indicated that KM policy could be integrated into the general library policy like other supportive policies created to support various library activities such as collection development policy and resource sharing policy. Further, Jain (2007) adds some contents which might be included in the KM policy are such as cataloguing, inter-library loans, acquisition, photocopying, library usage, computer usage, circulation, library strategic plan, external borrowers, and personal development policy. Therefore, academic libraries need to ensure the availability of KM policy for the application of KM practices.

The study findings have demonstrated the impact of organisational culture which ensures the application of KM practices in academic libraries needs to be considered. Organisational culture is among the essential KM enablers for the implementation of KM practices (Nold 2011). In other words, KM application is influenced by a well-established organisational culture (Erwee, Skadiang, and Roxas 2012). Good and direct organisational culture may encourage or inhibit KM practices within the organisation (Gold, Malhotra, and Segars 2001; Nonaka and Takeuchi 1995). Researchers have found that organisational culture is an important aspect for the success of KM practices. For example, in a survey of knowledge-based enterprises in Canada, the majority of the respondents agreed that their organisation had a culture that encourages and provides opportunities for communicating ideas, knowledge and experience internally (Ford and Chan 2003).

Academic libraries need to adopt the leadership that empowers individuals and ensure an organisational culture that appreciates all the forms of the knowledge are well maintained and communicated (Kaane 2009; Mostofa and Mezbah-ul-islam 2015). Wong and Aspinwall (2004) add that the most important part of the building block of the KM practices needs to be guided by the organisation culture. Therefore, as a result of the rapid environmental changes, academic libraries need to rethink about the organisational culture which enhances the application of KM practices. The study has observed the lack of the organisation culture that supports the application of KM practices among the visited academic libraries.

The study has reported the role of management support and leadership for the application of KM practices in the academic libraries. Studies conducted by Alazmi and Zairi (2003), Artail (2006), Davenport, DeLong, and Beers (1998), Hasanali (2002), and Jain (2013) provide the role of management to support the application of KM practices in academic libraries. Artail (2006), as well as Riege (2005), report that management support can influence other KM enablers such as organisational culture, trust, and motivation to facilitate the application of KM practices within the organisation. On the other hand, Jain

(2015), as well as Hasanali (2002) add that a well established management support and leadership can introduce the means of motivating to participate in the KM practices.

Incentives and rewards have also indicated among the KM enablers for the application of KM practices in the academic libraries. The study findings have indicated the importance of incentives and rewards to employees who participate in KM practices. The study has also observed the lack of rewarding systems to encourage library staff to participate in KM practices in the visited libraries. The rewarding system is one of influencing factors of organisational structure towards knowledge sharing behaviour (Kim and Lee 2006). Both financial and nonfinancial rewards are often suggested as means of encouraging employees to participate in KM efforts (Davenport, DeLong, and Beers 1998; Wong 2005). Smith and Mckeen (2003) add that bonus, incentives, and promotion could be used to strengthen one's motivation to do KM practices. The existence of organisational reward is seen as important in supporting KM practices as well as knowledge sharing (Lin 2007). In addition, some of the respondents reported the lack of any type of motivating factors in their libraries to make them share or hoard their knowledge.

Trust among library staff and users and/or the management members' needs to be established and encouraged to facilitate the application of KM practices in academic libraries. Trust is one of the fundamental cultures which supports KM practices and knowledge sharing (Al-Alawi, Al-Marzooqi, and Mohammed 2007; Ching-Lin 2003; Huang, Davison, and Cresswell 2008; Zhang, Faerman, and Cresswell 2006). Trust is used to encourage team members to gather new knowledge to develop useful decisions to solve problems (Politis 2003).

This study did not observe the direct trust among library staff in the visited the libraries; this is due to the fact that sometimes it might be difficult to observe trust. However, this study has observed library staff working in teams, eating, and laughing together which is the indicative of the existence of trust among library staff which could lead them however they might not indicate the existence of trust in sharing knowledge as well. Therefore, academic libraries need to encourage trust among library staff to ensure the application of KM practices. Wong (2005) suggests that without high mutual trust, people would be sceptical towards others' intentions and attitudes; they will, therefore, tend to keep or hoard their knowledge. Further, academic libraries need to provide an environment which encourages trust towards its members for the creation and sharing of knowledge, experiences, and understanding (Coakes and Clarke 2006).



The study findings have reported the role of KM training as among the KM enablers for the application of KM practices. Smith, Campbell, and Sbramanian (2001) discover that KM educational training among employees and the alignment of consensus are among the key factors for KM success. There is various KM training and training programmes which could be leveraged to ensure employees are getting reliable skills and knowledge for the application of KM practices. Despite the existence of LIS schools among the visited libraries, this study has observed the lack of the KM training programmes conducted in those LIS schools. Jain (2013) adds that only 20% (5) of the libraries had a provision for KM training.

This study has provided the need for regular KM training to library staff and other employees in the academic institutions. Alazmi and Zairi (2003), as well as of Artail (2006), provide the role of ongoing KM training and education for successfully KM application. The study findings indicate that training opportunities need to be provided based on the identified skills gaps under the personal development plan within the university. Further, KM training program, as well as, ongoing KM training and KM education should consider equipping library staff with KM skills and knowledge.

The study findings have provided the need for KM training for the better understanding of the KM practices and their benefits to the entire academic environment. Wong (2005) suggests that KM training could help library staff to improve their day-to-day tasks by means of engaging them in the KM practices. In addition, KM training and development are the essence for the creation and sharing of knowledge within academic libraries and the transfer of knowledge from one point to another. The changing role of academic librarians as knowledge managers emphasises the need to acquire new skills and knowledge to remain relevant in today's library environment (Shanhong 2000).

The study findings have considered the importance of IT to support the application of KM practices in the academic libraries. IT is used to support the application of KM practices in academic libraries and to ensure the flow of knowledge from one point to another. Smith, Campbell, and Sbramanian (2001) discover that IT allows the sharing and transfer of data over different platforms. Hendriks (1999) asserts that IT is used to motivate the sharing of the knowledge because it can execute four different functions which eliminate hindrances, provide channels to obtain information, correct the flow of processes, and identify the location of knowledge carrier and knowledge seeker. Thus, IT can be referred to as the hygiene factor, since without it; knowledge created and shared can be obstructed. Davenport, DeLong, and Beers (1998) believe that in the building of KM practices into the fundamental building of IT creates a common controllable environment so that knowledge can be created and shared within the organisation.

On the other hand, the study finding has observed the number of ICT infrastructures such as computers, printers and photocopy machines in the majority of the libraries visited; however, most of them were out of date. Riege (2005) adds that ICT infrastructure is shifting from a focus on the collection and codification of knowledge to enable library staff to connect directly to users and employers. Alazmi and Zairi (2003) identify 15 recent studies that examined the critical factors for ICT infrastructures to the success of KM and found that ICT infrastructure was the second most frequently mentioned in KM practices. Further, Davenport, DeLong, and Beers (1998) conclude that KM initiatives have the best chance for success when IT infrastructure is already in place, is robust and is diversified enough to suit the differing needs of multiple audiences within the organisation. Consequently, the collaborative and communicative capabilities of ICT infrastructure have become much more critical to the success of KM initiatives.

### **6.5 Knowledge creation and sharing practices through Knowledge Creation (SECI) Model**

This study has examined the creation and sharing of knowledge through the application of Knowledge Creation (SECI) Model. Maponya (2004) adds that knowledge in the context of academic libraries can be created through the understanding of library users' needs and their requirements. Therefore, there is a need for "knowledge creation" in higher learning institutions, thus library staff need to be encouraged to collaborate with other specialities and faculties to provide the necessary knowledge, technology, information, and services (Gayton 2008; MacWhinnie 2003).

Knowledge Creation (SECI) Model was adopted in this study to explain the activities conducted to ensure the creation and sharing of knowledge in academic libraries. These activities are examined under SECI processes. Becerra-Fernandez and Sabherwal (2001) add that SECI processes of Nonaka et al. (1994) could be used to describe ways in which knowledge is created and shared through the interaction between tacit and explicit knowledge. Therefore, SECI processes are used to facilitate knowledge creation practices (discovery and capture) (Becerra-Fernandez, Gonzalez, and Sabherwal 2004) and knowledge sharing (Becerra-Fernandez, Gonzalez, and Sabherwal 2004; Jennex and Zyngier 2007).

The study findings have revealed that much of the knowledge created and shared by the majority of academic libraries is not well identified, known, and/or used. Parirokh, Daneshgar, and Fattahi (2008) add that knowledge sharing has not been institutionalised in the majority of academic libraries. The study findings present a number of activities to enhance knowledge creation and sharing practices under SECI processes as follows:

### **6.5.1 Socialisation process**

Socialisation process includes the activities which mixing socially with other activities to support knowledge creation and knowledge sharing (Becerra-Fernandez, Gonzalez, and Sabherwal 2004). The study has identified several activities which could be performed under socialisation process such as gather knowledge from various library activities, share experiences among library staff, and conduct departmental meeting. For example, sharing of experiences and skills among library staff will probably increase work performance and the quality of their work. This will also provide a chance for the library staff to learn from each other and, therefore, to increase their working experiences. Nonaka et al. (1994) add that experience is the key to acquire more knowledge. Sharing experiences and gathering information are very important to enhance the creation and sharing of knowledge in academic libraries (Karim, Razi, and Mohamed 2012:783). In addition, Kim and Lee (2005), as well as Teerajetgul and Charoenngam (2006), explain that sharing knowledge and experiences enhance the creation of new knowledge and improves the effectiveness of the organisation' performance.

Academic libraries need to select/have a special place/room within or outside the library for socialising, discussing, and sharing of knowledge. Such room needs to have entertainment equipments such as Television (TV) Set, computers, posters, and magazines for the member to read and share ideas among library staff and between their users. Academic libraries on the other hand need to employ a knowledge culture to facilitate and guide the creation and sharing of knowledge. Berry (2014) adds that knowledge sharing culture can be a scary proposition for KM teams to participate in the traditional of knowledge creation and sharing activities. A "knowledge-sharing culture" is believed to facilitate the growth of intellectual capital within the organisations, and also creates the need for effective KM practices in academic libraries (Gupta and Govindarajan 2000).

Staff and departmental meetings can also be used to facilitate the creataion and sharing of knowledge. During such meetings, library staff could be encouraged to present and to share matters and issues concerning the development of their libraries. Staff and departmental meetings need to be conducted on a regular basis to ensure that library staff contributes well to the progress of their libraries. On the other hand, academic libraries could invite external experts to impart academic librarians with the new insights on the improvement of library services as well as to enhance KM practices. The study has observed departmental meetings in the most of the visited academic libraries.

Knowledge creation and sharing can also be obtained through finding new strategies and opportunities inside the library. There are various new strategies such as developing new ways of sharing knowledge and organising library materials. New strategies and opportunities help library staff to gain new skills to create and share knowledge. Library staff also needs to be engaged in developing the network to various stakeholders outside the library. Due to the fact that information environment has become increasingly networked, academic libraries are required to form new partnerships with other libraries to develop and improve services and products that support users to their information/knowledge needs (Jain 2007).

Building networks especially knowledge networks helps academic libraries to create, manage and share tacit knowledge (Nonaka and Takeuchi 1995). Developing networks is an important way to build the strong partnership with other libraries and help library staff to learn from other libraries. A strong partnership is very important in academic libraries' environments whereby most of the academic libraries face countless challenges that are so complex and interrelated that no single library can cope to address them alone. Jain (2007) adds that strong partnership with other libraries is an external form of sharing and exchanging of information and knowledge.

### **6.5.2 Externalisation process**

The study has identified several activities which are conducted under externalisation process to enhance knowledge creation and sharing. Some of such activities include current awareness services (CAS), exchange of ideas and opinion, develop and disseminate brochures, leaflets, and posters, and collect knowledge from inside and outside the library. CAS is employed to inform library users on the arrival of new materials and resources within the library. Despite the number of new books observed in the majority of the visited academic libraries, this study did not observe CAS services in such libraries.

Exchange of ideas and opinions with colleagues and stakeholders were also reported in this study. Tang (1998) adds that from the library's perceptions, knowledge creation implies participating in user's reading and studying by exchange of ideas and skills; and also identifies information needs among library users. Thus, to succeed, academic libraries need to link their services with the university's academic programme or curricula to identify critical areas which library users can to be able to access, retrieve and use information.

Library staff needs to participate in teaching, learning, research and innovation activities of the university (Maponya 2004). The study has observed a number of library staff teaching in the library schools available among the three academic libraries visited. School libraries are central to learning and play a

key role as a place to encourage knowledge creation and sharing practices, innovation and problem-solving. Thus through teaching and learning activities, knowledge is created and shared within the academic environment. Librarians need to ensure that knowledge created are documented, shared and retrieved to be reused.

Library staff could also participate in knowledge creation and sharing by collecting knowledge from inside the library. Such knowledge can be obtained from manuals and reports and such knowledge could be used to create new knowledge. There are a number of reports which are created within academic libraries every day which contain knowledge for the benefit of the entire academic community. Examples of such report are annual report and library progress report. Academic libraries could also obtain knowledge from outside the library. Such reports include policies and strategies. The study finding provides that academic libraries should receive and store those reports and arrange them according to library's classification system in use. The study has observed a number of reports in the majority of the visited academic libraries.

Library staff should participate in writing and documenting minutes in departmental meetings to learn and develop their skills on writing minutes. This will help them to have a clear focus on what is needed for their libraries. Library staff could also facilitate discussions in their libraries where they can collect and record them and then store them safely for future reference. Librarians also participate in groups created by library users and become the members in such groups where they can be able to learn and identify the knowledge needs of their users and direct them to the reliable sources. This also could lead to the creation and sharing of knowledge within the library.

According to Teerajetgul and Charoenngam (2006:592) engaging in dialogue with customers will help library staff to develop their skills and understanding in various subject matters as they serve the users. In addition, library staff could get a chance to learn about information needs and information seeking behaviour of library users to assist them perfectly. Teerajetgul and Charoenngam (2006:592) explain that engagement in dialogue with customers (library users) or brainstorm sessions could enhance sharing experiences and ideas. However, this study did not observe such kinds of discussion among the visited academic libraries.

Academic libraries need to create and disseminate brochures which include all the activities and other necessary information which library users need to know. Library staff could also create posters and leaflets with include information about the resources available and the services offered by such libraries.

Generally, libraries create brochures about the activities conducted in the library and sometimes they can create leaflets which have maps or guides to direct users to various sections within the library. Leaflets and brochures could also be distributed to library users and visitors to learn more about the activities and services offered by such libraries. In addition, Nonaka and Konno (1998) add that externalisation can be achieved by writing a description of work processes, through debates or self-reflections. Cataloguing and classification are among the activities performed in academic libraries to ensure the creation and sharing of knowledge. The study has observed ongoing classification and cataloguing activities in few of the libraries visited.

### **6.5.3 Combination process**

Combination process aids the creation of new explicit knowledge through systematisation of explicit knowledge (Becerra-Fernandez, Gonzalez, and Sabherwal 2004). The new explicit knowledge can be disseminated among the members of the organisation using computerised communication networks and large-scale databases (Nonaka and Toyama 2003). In order to ensure proper creation and sharing of knowledge through combination, library staff needs to facilitate the acquisition and integration of knowledge in the academic libraries. Knowledge acquisition is the process of getting hold of knowledge from human experts, books, documents, sensors or computer files.

The study has identified the following activities under combination process: strategic planning and operations preparation, guidelines, reports, literature, policies/strategies preparation, develop and create training materials, and create databases of knowledge and services. Individuals can exchange and combine knowledge through communication and integration (Nonaka et al. 1994). In order to acquire and integrate knowledge, academic libraries must adopt various activities such as teaching and learning, research, scholarly communication, and cataloguing and classification. Library staff needs to participate in writing guidelines, reports, literature, policies/strategies under combination process. The study has observed library policies at ARU, MUHAS and SUA Libraries. In addition, the study has observed MUIR Policy at MU Library. The application of databases within academic libraries leads to the creation and sharing of knowledge among staff. Library staff must develop and create training materials and disseminate them to their users. This activity will help library staff to create more knowledge.

In most cases, library staff needs to participate in formulating and developing the strategic plan which predict the activities which could be performed yearly. The strategic plan is used to guide the implementation of various activities in a certain period of time. Strategic plan for libraries may range from five to fifteen years. Establishment and creation of databases help academic libraries to store data,

information, and reports. KR is an example of a database which is used to store knowledge within the organisation. The study has observed an IR at MU, MUHAS and SUA Libraries, as well as, the special IR, TacciRe at SUA Library to store climate change documents.

Nonaka and Takeuchi (1995) suggest that KR helps the organisation to connect people with information and knowledge via online searchable libraries, discussion forums and other online mechanisms. Combination process provides a form of KR that serves as a resource to continue within the KM cycle (Chou et al. 2010). Chou et al. (2010) suggest other activities which could be performed under combination process which include integrating best practices, communicating with other members, disseminating information and ideas from members, and providing the systematic approach for analysing and evaluating information.

#### **6.5.4 Internalisation process**

Internalisation process represents the traditional notion of learning, as the individual acquiring the knowledge can re-experience what others have gone through (Becerra-Fernandez, Gonzalez, and Sabherwal 2004) that eventually become one's own knowledge (Nonaka and Toyama 2003). It includes activities such as teaching and learning activities, preparing lessons, conducting lectures, communicating and sharing ideas, and asking questions during the presentation. This study had reported that library staff should participate in teaching and learning activities under internalisation process. Academic libraries should encourage and conduct hybrid learning, as well as collaborative learning activities. Teaching and learning activities involve cooperative/collaborative learning underpinned by the constructivist paradigm (Penzhorn 2013). Constructivist teaching is based on the belief that learning occurs as learners are actively involved in the process of meaning and knowledge construction rather than passively receiving information. Learners are the makers of meaning and knowledge.

Constructivist teaching fosters critical thinking and creates motivated and independent learners. Further, constructivism is a view of learning based on the belief that knowledge isn't a thing that can be simply given by the teacher at the front of the room to students in their desks. The study has observed library schools at MU and SUA Libraries which offer LIS studies to librarians all over the world. The study has also observed information literacy training (ILT) programmes at MUHAS, as well as, library orientation programmes in the majority of the libraries visited.

Discussion and facilitation during meetings, workshops and seminars are also used to facilitate the creation and sharing of knowledge. Library staff facilitates knowledge and sharing practices through

conducting surveys and sharing results within the entire library. SDI is used to inform library users about the arrival of new materials based on their subject/knowledge need. SDI includes sending new arrival to specific department/individual. In this activity, library staff communicates with individual library users, learns their information/knowledge needs, and then links them within the library.

Librarians need to participate in various research activities. Librarians have required to present papers in the various conferences within and outside the country to facilitate knowledge creation and sharing. There are various conferences, associations and workshops conducted all over the world about library issues. For example International Federation of Library Associations and Institutions (IFLA) World Library Conference, and Standing Conference of Eastern, Central and South Africa (SCECSAL) aim to develop libraries. In addition, there are two major library associations in the country which were originated from and maintained by librarians and libraries in Tanzania. These are the Tanzania Library Association (TLA) and the Consortium of Tanzanian Universities and Research Libraries (COTUL).

The TLA was established in 1973, aims to unite all libraries and librarians in Tanzania (TLA 2003). This was after the dissolution of the East African Library Association (EALA). The head office of TLA is Maktaba House in Tanzania (TLA 2003). COTUL came from the need to effectively and efficiently addressing some deficiencies in the provision of adequate study resources through capacity building in information provision (COTUL 2011). Each region in Tanzania has a regional library which is automatically a permanent member of the TLA. Private libraries, academic libraries, school libraries and research libraries are also members, but their membership is not automatic. The majority of the respondents reported attending workshops and training organised by COTUL and TLA. However, few of them reported attending workshops organised by IFLA and SCECSAL.

## **6.6 The access and use of Web 2.0 tools in academic libraries**

Academic libraries provide knowledge to library users on a daily basis. Thus, the access and use of Web 2.0 tools in academic libraries is among the efforts to effectively meet the emerging and diversifying needs of their users in an increasingly networked information sphere. The following sub-sections provide the discussion on access and use of Web 2.0 tools in academic libraries.

### **6.6.1 Web 2.0 tools awareness and Web 2.0 tools accounts**

Prior to the access and use of Web 2.0 tools in academic libraries, it was deemed necessary to establish the level of awareness and usage of Web 2.0 tools among individual library staff. On the other hand, the majority of the respondents acknowledged that they had used at least one of the Web 2.0 tool available on the Internet. This indicates the highest level of the access and use of Web 2.0 tools among library staff.



The majority of respondents reported having more than one account on Facebook, WhatsApp and Twitter. Lwoga (2013) adds that the majority of the respondents had personal account on various social networking tools such as the Facebook.

Logistic regression finding has indicated that male respondents reported using Web 2.0 tools. A similar finding was reported by Mtega et al. (2014) on their study on the awareness and use of Web 2.0 technologies in sharing of agricultural knowledge in Tanzania which indicate that the majority of the respondents were male. A study conducted by Muneja and Abungu (2012) indicate that male respondents were frequent users of Web 2.0 tools in academic libraries. On the other hand, Collins and Hide (2010) conduct a study which involved 12,000 researchers in the United Kingdom and they found that more males than females used the Web 2.0 tools. Collins and Hide (2010) further elaborate that gender has also an influence on the rate of adoption and usage of Web 2.0 tools in academic institutions.

The study findings present the evidence that the majority of respondents fall under the age group of 21-30 years. This concluded that younger people participated in this study. The study findings have added that young generation is more competent in using Web 2.0 tools. A similar finding was obtained from a study done by Mtega et al. (2014), as well as, Redden (2010) indicate that the main users of Web 2.0 tools in the academic libraries belong to the young generation. Collins and Hide (2010) also indicate that younger researchers adopted and used Web 2.0 tools more than the older ones due to the fact that old researchers already had some networks and rarely needed Web 2.0 tools for making one. Procter et al. (2010) also support that teenagers adopt and use Web 2.0 tools than adults who are contributed to by their eagerness to learn new technologies. Additionally, young people belong to the new generation or the Google generation which includes people born after the emergency of the computers.

Prensky (2010) supports the viewpoint that the Google generation is a group of digital natives who grew up with computers and web-based technologies and who believed to be more technologically savvy and perhaps more technologically dependent than any preceding generation. This generation is using technology at higher rates than any previous generation, and appears to be embracing a new or second generation of Web applications that facilitate sharing, interaction and collaboration (Prensky 2010). Collectively, we call these technologies Web 2.0 (O'Reilly 2005). Further, Redden (2010) adds that while librarians are accustomed to consulting traditional library resources such as a catalogue, a database or even a book, younger generations including Generation Xers and Millennials assume any information they need is available somewhere on the Web.

### **6.6.2 The uses of Web 2.0 tools in academic libraries**

The majority of academic libraries visited have websites. However, the study findings have revealed the low level of using such websites among respondents. On the other hand, most of such websites were out of date and few of them were not updated in ages. The study has observed and viewed the MUHAS, OUT, MU and SUA's Websites. The study reports that the availability of websites in academic libraries presents the visibility of such libraries worldwide. Han and Liu (2010) add that library websites act as information/knowledge dissemination spaces used to provide information services to library users and act as library promotional mechanism (Han and Liu 2010). Liu (2008) also support by adding that "Academic library websites are libraries' virtual presentation to the world". Thus, academic libraries need to update their websites to inform their users about the new information and issues added recently in such libraries. Dynamic or interactive websites should encourage user participation and collaboration to various library services (Liu 2008).

Respondents 72(28.3%) reported using Web 2.0 tools to access library services and resources. The study findings have indicated the low access and use of Web 2.0 tools in the most of the academic libraries in Tanzania. A similar finding was obtained from the study of Xu, Ouyang, and Chu (2009) which concludes that out of 81 academic libraries surveyed in New York State, only 34 (42%) were using Web 2.0 tools to improve library services. On the other hand, Linh (2008) provides that among the visited Australasian University Libraries (AUL), only two-thirds of AUL reported using one or more Web 2.0 technologies, however, the average of these indexes were reported low. Further, studies conducted in African countries on the access and use of Web 2.0 tools in academic libraries indicate low access and use of Web 2.0 tools (Lwoga 2013; Penzhorn 2013; Muneja and Abungu 2012). Clearly, the adoption rate within libraries of the elite universities in Africa was found to be far below that of the developed world (Woldofa 2014).

Woldofa (2014) argues that although the use of the Internet in Africa has shown significant growth; the adoption of Web 2.0 technologies by academic libraries in Sub-Saharan Africa is still at an early stage. However, libraries in South Africa and some in East Africa are currently using Web 2.0 tools for innovative service delivery. Logistic regression findings have indicated that both MU and SUZA Libraries have shown the strongest significant effects on the access and use of Web 2.0 tools. UDSM Library has also shown the highest level of using Web 2.0 tools. Despite the fact that MUHAS Library has a big number of Web 2.0 tools as compared to the other visited libraries. The study findings have indicated the low level of using Web 2.0 tools at MUHAS Library.

Administrators have shown significant effect towards the application and the using of Web 2.0 tools in academic libraries. Administrators seem to be more familiar with various processes used in the application and integration of Web 2.0 tools; therefore, they are more likely to use Web 2.0 tools. On the other hand, academicians seem to be busy in teaching, learning, research and innovation activities. Aharony (2009) supports the argument by adding that library managers are more aware of technological developments, application, integration and their impact on their libraries and their users. In addition, library managers apply new technologies and possibly include them as new services to their libraries (Aharony 2009).

E-resources and ICTs departments have shown the significant effect on using Web 2.0 tools in academic libraries. The study findings have revealed that E-resources and ICTs departments showed the strongest effect of the application of KM practices, as well as on the access and uses of Web 2.0 tools in academic libraries. Thus, such departments need to be motivated and they can lead other departments on the application of Web 2.0 tools to enhance KM practices in academic libraries.

Despite the fact that respondents were not asked to mention types of Web 2.0 tools available in their libraries, the study has observed the availability of Web 2.0 tools in the following academic libraries: MUHAS- Facebook, Social Bookmarking, Tagging, Blogs, Mashups, RSS Feeds and twitter; SUA- Facebook and Twitter; MU- Facebook, Blog, Twitter, Google+ and LinkedIn; OUT- Facebook, Blog and Twitter; UDSM- Facebook and Google+. Additionally, the study has observed that Web 2.0 tools available at UDSM Library are invisible; you cannot see the icon on their website as it is shown in other libraries' websites. You can find the following information "UDSM Library Facebook Page" and when you click in that message it leads you to that Facebook page. This is indicated that the UDSM Library Facebook Page is used for library accessibility and updates only and not for other activities like the other Facebook pages visited.

The study findings also indicate that Facebook is the most popular Web 2.0 tools as compared to other Web 2.0 tools. This is due to the fact that the majority of respondents reported having the individual Facebook account; and on the other side, the study observed Facebook accounts in the majority of the visited libraries. Similar observations were obtained from the following studies: Muneja and Abungu (2012) on their study about the application of Web 2.0 tools in delivering library services in the selected academic libraries in Tanzania indicate the availability Web 2.0 tools accounts as follows: Facebook (94.4%), followed by Twitter and weblogs (66.7%), and Google docs (50%). Boateng and Liu (2014) provide the Web 2.0 applications' usage trends from the top 100 US academic library website which

indicate that SNS specifically Facebook and Twitter were found to be the most popular Web 2.0 tools in such libraries. Again Charnigo and Barnett-Ellis (2013) provide useful insights that revealed that academic librarians have been using Facebook as a tool in delivering library and information services to the patrons.

### **6.6.3 The uses of various Web 2.0 tools in academic libraries**

Respondents provide various uses of Web 2.0 tools in their libraries. The majority of the respondents reported the following uses of Web 2.0 tools in academic libraries: online communication and sharing of information, collaboration and participation, enhance reference services, scholarly information, and sharing of research findings.

Pienaar and Smith (2007) assert that the UP Library in South Africa employed Web 2.0 tools to communicate with their users so as to receive feedback from them on where and how to improve the library services. Xu, Ouyang, and Chu (2009) add that through online communication and sharing of information within the library, library users can ask library staff questions in real time and regardless of the where they are. For example, a library can create a Blog to enhance internal and external online communication to improve library services.

Online communication and sharing information helps academic libraries to receive feedback from library users and other stakeholders towards the improvement of library services. Penzhorn and Pienaar (2009) add that Web 2.0 tools aim to facilitate online collaboration and information sharing in higher learning organisations. Online communication and information sharing through the application of Web 2.0 tools have become an integral part of people's everyday lives (Akeriwa, Penzhorn, and Holmner 2014). Woldofa (2014) supports that Facebook and Twitter are the most popular tools for communicating and sharing library news and announcements, creating awareness on library services and resources, directing users to online databases and freely available e-resources, promoting new or existing services, and interacting with users on library-related issues. For example, some libraries integrate WorldCat and JSTOR search boxes on their SNSs.

The Facebook page provides opportunities for libraries to communicate better with their users. Facebook is a platform for interaction and a source of receiving feedback from users on library services (Penzhorn 2013). Libraries gain insights into what their users want and need through Facebook. Ultimately they can understand their users better. Academic libraries which are using the Facebook page must address the consistency and timeliness of the service. Users will expect timely responses to any enquiries sent through

the Facebook page. They are unlikely to return to a Facebook page for library assistance if librarians do not respond quickly to their enquiries. Charnigo and Barnett-Ellis (2007) explain that Facebook is used by the US academic librarians to provide useful insights with revealed that academic librarians have been using Facebook as a tool for delivering library and information services to the patrons.

Web 2.0 tools are also used to enhance collaboration and participation between library staff and library users. Web 2.0 tools help academic libraries to conduct and facilitate online participation and collaboration between academic libraries and library users; whereas, library users can have the ability to respond and provide feedback to the library; and at the same time, academic libraries increase their understanding of their users and also to respond to users' needs (Ponelis and Africa 2013:232). Miller (2005) adds that "Participatory" is the main change in the context of Web 2.0 tools. Web 2.0 tools are therefore, used to facilitate collaboration among researchers by opening up new forms of collaboration and participation that are not so bound by time, place and access (Penzhorn 2013).

Through collaboration and participation, library users express their feelings and opinions towards services offered by the libraries (Arya and Mishra 2012; Veletsianos 2013). Ponelis (2013:233) suggests that Web 2.0 tools in academic libraries allow library to a patron (L2P) or library to the library (L2L) collaboration on various library issues. Procter et al. (2010) also add that the extent to which researchers are engaged in collaborative research activities can also influence the rate of adoption and usage of Web 2.0 tools.

In the academic library setting, My Library or My Research is a good example for collaboration and participation functionalities. For example, University of Oklahoma Library stored My Library to allow users to personalise their library homepage by adding features and links that are most useful to them for quick and easy access to the information they need. Wiki is also used to enhance collaboration in the academic libraries. Bejune (2007) adds that 45.7% of the surveyed libraries have used Wikis for collaboration and participation, 31% among library staff, 14.3% among library staff and patrons, and only 8.6% among patrons.

CiteULike is used to enhance online collaboration among researchers especially on sharing and saving citation (Mosh, Holmner, and Penzhorn 2015). CiteULike allows the individual researcher to have their own page which they can use for various research activities. CiteULike is also known as everyone's library, whereas any authorised library user can tag and route references, import and share scientific references from desktop reference, and store and manage academic references including original texts.

The emergence of Web 2.0 tools facilitates reference librarians works by enhancing communication with library users through such tools. In other words, reference librarians can respond to library users' queries through the application of various Web 2.0 tools. There are various Web 2.0 tools which could be employed to facilitate reference services in the academic libraries. According to Xu, Ouyang, and Chu (2009) Instant messaging is regarded as among the useful Web 2.0 tool which can be used as an alternative communication channel in reference services between librarians and library users or among library users. Instant messaging is used to share text messages and multimedia resources such as photos and videos among users (Harinarayana and Raju 2010). Bradley (2007:137) adds that:

Instant messaging provides faster access to information in most cases, allows both parties to see the reference-related questions, and having this service available to patrons gives an academic library's reference services the ability to have a constant presence on their website and within their patron's chat software, if the patron chooses to add the reference services to their address book.

Reference librarians can also use Wikis to respond to reference questions (Lankes 2008).Penzhorn and Pienaar (2009) assert UP Library conducts reference interview through the application of various Web 2.0 tools including Wikis. According to Penzhorn and Pienaar (2009), the interview schedule with reference consisted a set of questions guiding reference librarians on how to respond to users' queries. Some of such questions include questions on the information sought and searching behavior of their users, whether they had any idea of the number of other library users using Web 2.0 tools, and whether they have conducted any formal information needs studies/analysis of their users. Currently, UP Library is using Web 2.0 applications such as RSS Feeds from the catalog and book covers sourced from Amazon.com integrated with the catalog, email notification via FeedBlitz when the library's web page is updated, Blogs and Wikis as communication tools, and a list of web tools on the library's web page as a reference for users (Munatsi 2010).

Web 2.0 tools facilitate scholarly communication, social scholarship and sharing research findings. These activities have an impact on the library users than library staff to discuss their studies and research findings through the use of Web 2.0 tools. Library users can formulate various groups according to their specialities and discuss their studies, as well as, their research works through various Web 2.0 tools. Wiki is regarded as one of the important tools to support scholarly communication tool especially within a group-authored publication (Cohen 2007). Borgman and Furner (2002) suggest that scholarly communication is the process of sharing and publishing research works and outcomes.

Scholarly communication is among the critical services in academic libraries which require users' participation and collaboration. Thus, libraries need to create a good environment whereby teachers and students can interact and participate in online communication, collaboration and sharing of information/knowledge. Gu and Widen-Wulff (2011) add that Web 2.0 tools give opportunities and tools for new communication channels to enhance scholarly communication. In other words, scholarly communication involves the use and disseminate of information through formal and informal channels (Penzhorn 2013).

Social scholarship, on the other hand, is the practice of scholarship in which Web 2.0 tools are used to enhance dynamic collaboration, communication, participation and sharing of knowledge, information and ideas to enhance research activities and publishing process (Penzhorn and Pienaar 2009). In other words, the social scholarship is the practice of scholarship in which the use of Web 2.0 tools is an integral part of the research and publishing process. The social scholarship is also regarded as a place where social scholars discuss different activities such as research findings, progressive information and so on through social media tools such as Blogs, Wikis, and RSS Feeds (Penzhorn 2013). The social scholarship helps researchers to make their work available in the open access and contribute to conversations about their research by discussing their research works with other researchers through Web 2.0 tools such as Blog and Wikis (Penzhorn and Pienaar 2009:1).

Web 2.0 tools facilitate marketing and promotion of library services to the world. Web 2.0 has become a popular and trendy marketing tool (Harinarayana and Raju 2010; Mahmood and Richardson 2012). Jain (2013) adds that "social media is integral to market library services and products among inline users". Marketing, branding and promoting activities are very crucial to non profit institutions such as academic libraries as for profit companies. Most of the libraries are not-for profit institutions, but they need to improve their visibility and image to attract more users to utilise their materials and services (Xia 2009:469).

Gambles and Schuster (2003:364) mention reasons for marketing and promoting library services which are: creating, developing, and promoting the opportunities for long learning, promoting reading as essential life skills and as a source of pleasure and enjoyment, and to contributing to the development of ICT within learning communities. On the other hand, it is not easy for library users to know all the services offered in a library; it is, therefore, the responsibility of the library itself to make sure all the services and activities are well known to the public to have more users use their libraries. Schmidt

(2007:340) adds that “many libraries have wonderful services and products but users are unaware of their availability.” Therefore through marketing and promoting library services through Web 2.0 tools, the entire universe will be informed of the services and be able to visit and the use of library services.

Web 2.0 tools such as IM, RSS, Blogs, Google+ and Facebook help academic libraries to market and promote information services to the public. Wen (2005) suggests that libraries should be more proactive in marketing their services to their users. For example, Google+ can also be employed to help the library to update its services to keep library users in touch (Schmidt 2007). Blogs can be used to market and promote library services (Mosha, Holmner, and Penzhorn 2015). This study has observed MUHAS and OUT Libraries marketing their services through Facebook and Blogs.

Further, interaction was also identified as among the application of Web 2.0 tools. According to Xia (2009), the interaction will make librarians to advertise and promote various library services to the library users. Academic librarians need to interact with individual followers who usually follow library services and updates (Xia 2009). For example, the application of social networking sites such as Twitter can allow followers to “re-tweet” or “re-post” comments made by others (library users) about the library services being promoted; therefore through repeating the message, other library users who are connected can be able to see the message (Carscaddon and Chapman 2013; Xia 2009). In addition, SNS acts as a word of mouth in marketing and promoting library services whereby library users can be able to post reviews, rate customer services and ask questions (Penzhorn 2013).

Web 2.0 tools facilitate Inter-Library Training (ILT) or Inter-Library Literacy (ILL) programme whereby library users learn how to locate, retrieve and use the information through Web 2.0 tools. Web 2.0 tools such as Wikis and Blogs are more applicable to facilitate ILL activities within academic libraries. Wiki is regarded as a tool for improving ILL within academic libraries (Hsu and Lin 2008). The study findings have reported that ILL is used to teach library users to find, to locate, and to use information within the library. Among the widely accepted definition of ILL is that of the Chartered Institute of Library and Information Professionals (CILIP) which states that ‘information literacy is knowing when and why you need information, where to find it and how to evaluate, use and communicate it in an effective manner’(Godwin 2007). Fernandez-Villavicencio (2010:125) adds that the goal of ILL is to help library users become more confident and effective in solving their information problems, as well as, making their decisions in an increasingly digital-based society rather than a physical document-based environment.

Web 2.0 tools facilitate knowledge and information sharing in academic libraries. Therefore, academic libraries need to employ various Web 2.0 tools to foster information and knowledge sharing among



library staff, library users and the entire academic community. Web 2.0 tools such as Blogs and Wikis can be used facilitate information acquisition, gathering and dissemination in the library (Lwoga 2013:289). Han and Liu (2010:52) assert that through knowledge and information sharing, academic libraries can be able to develop their own social community to engage more library users with improved openness and flexibility (Han and Liu 2010:52). The social citation and social bookmarking tools could also be used to enhance information and knowledge flow in academic institutions,

### **6.7 The application of Web 2.0 tools to enhance KM practices in academic libraries**

The study findings have reported the low level of using Web 2.0 tools to facilitate KM practices. Only quarter of respondents 41 (16.1%) reported using Web 2.0 tools to enhance KM practices in academic libraries. Islam, Agarwal, and Ikeda (2014) add that few libraries are currently using Web 2.0 tools to enhance KM practices in libraries. The emergence of Web 2.0 has brought new opportunities for library staff, therefore, increasing the roles of library users to participate in KM activities (Kim and Abbas 2010). In this digital age, knowledge can be transferred in the form of knowledge-based services and products such as e-mail, Web 2.0, websites, online discussion forums, video-conference and other collaboration tools (Agarwal and Islam 2014). Web 2.0 tools are leveraged to support knowledge sharing, creation and other knowledge processes.

The understanding of KM has undergone a paradigm shift from a static, knowledge-warehouse approach towards a more dynamic communication-based or network approach (Kuhlen 2003). Wickramasinghe (2003) explains that in its broadest application KM refers to how firms acquire, apply and store their own intellectual capital. From a theoretical standpoint, Wickramasinghe (2003:298) adds that KM refers to the information systems adopted and designed, which is efficiently and effectively leverage the collective, experience, and knowledge of the employees to support information and knowledge.

Web 2.0 tools enable new modes of communication between institutions and their employees hence facilitate knowledge creation and sharing practices. Makori (2012:31) suggests that in the modern knowledge environment, academic libraries should think about how to integrate and apply Web 2.0 tools to facilitate knowledge creation and sharing. In particular, Web 2.0 tool play major key roles in the dispensation of information, knowledge and communication services in academic libraries (Makori 2012:31).

Web 2.0 tools enhance the web-based collaborative-authoring (or content-management) thousand to facilitate the creation and sharing of knowledge (Murugesan 2007; Salajan and Mount 2012). Knowledge

sharing is one of the motivations of scholarly communication, thus, Web 2.0 tools such as Facebook, Twitter, and Blogs could be applied to link scholars all over the world (Gu and Widen-Wulff 2011). Web 2.0 has reinvented the concept of KM towards the vision of facilitating interaction, cooperation and knowledge changes between individuals, groups and communities (Levy 2009; Mtega et al. 2014).

There are various categories of Web 2.0 tools which could be employed to enhance KM practices in academic libraries. For example, video and audio sharing tools such as YouTube and Podcasts contain audio and video contents which are available on the Internet, and which can be accessed through personal computers or MP players (Harinarayana and Raju 2010:75; Kim and Abbas 2010:214). Penzhorn (2013:66) suggests that “Research has shown that information is remembered better if it is encoded both visually and verbally”. The study conducted by Moshia, Holmner, and Penzhorn (2015) indicate the use of YouTube to enhance knowledge sharing in higher learning institutions in Tanzania. Application of YouTube within the library can enhance sharing videos of news and various subjects and enhance interviews and speeches conducted within libraries (Mahmood and Richardson 2011:371).

Tripathi and Kumar (2010:196) add that “Libraries use podcasts mainly for offering tips, using the audio format”, and in some cases, YouTube can be linked with library catalogue, therefore, making it easier for library users to retrieve, access and share knowledge within the library (Webb 2007). The use of podcasts was also identified among the useful Web 2.0 to enhance KM practices among academic libraries (Kim and Abbas 2010). The Podcast is an excellent tool to share knowledge and inform users about library services, resources, and research opportunities. Podcast allows web users to communicate verbally and visually through the use of a recording device (Kim and Abbas 2010).

Librarians can “podcast” messages live or record podcasts using MP3 recording devices and web cameras that can be uploaded to a website to share information with users. Academic library users can benefit from podcasting through RSS Feeds and through the bookmarking of these podcasts (Kim and Abbas 2010; Penzhorn 2013). Web 2.0 tools enhance KM and usually involve more people in knowledge creation and sharing processes as they allow multiple people to collaborate when creating and sharing of knowledge (Majchrzak, Wagner, and Yates 2013).

The study findings have indicated SNS such as the Facebook, Twitter and MySpace to enhance KM practices in academic libraries visited. The study has observed the availability and accessibility of Facebook in few of the visited libraries. Thus, the application of SNS to enhance KM practices provide an evidence that various SNS are well known and used by the majority of people, thus, can be applied to

facilitate the creation and sharing of knowledge within academic libraries. Lwoga (2013) supports that the use of SNS such as Facebook and Twitter to enhance knowledge creation and sharing in academic libraries. Farkas (2007) explains that creating a presence in Facebook makes the library more visible and more convenient to access, and it could be used as a medium to remove barriers between users and library in KM practices. For example, a library can post new information and invite users to share and add comments whereas anyone can “Like” and “Comment” the status in the “Wall” by clicking both icons at the status.

Updating status on the “Wall” on the Facebook page has described as communication applications (Russell 2007). Facebook (2011) defined “Like” as “a way to give positive feedback or to connect with things users care about on Facebook. “Like” is an easy way to let someone know that users enjoy it, without leaving a comment.” The “Like” and “Comment” features in Facebook have become central to the way people communicate on Facebook. The function on the “Wall” such as “Post”, “Like” and “Comment” make it easy for users to give their feedback on the posted information. If the users like something on the library posting but they do not want to put any comment, they can just simply click the button “Like”. In this sense, Facebook offers users a forum for self-expression, conversation and knowledge sharing.

The study findings provide the use of authoring tools such as Blogs, Wikis, Content sharing and Content Management System (CMS) to enhance KM practices. Blogs were among the Web 2.0 tools selected by the majority of respondents; thus, respondents reported the needs to employ Blogs to enhance KM practices in academic libraries. Blogs can be used by any person, in other words, no skills are needed to use Blog.

Wiki is used to facilitate communication, to distribute documents, to collaborate and share information and knowledge, to organise documents and resources from individuals and within groups (Grosseck 2009; Tripathi and Kumar 2010). Wikis facilitate the creation and sharing of knowledge among users. Wiki have the great potential to leverage knowledge creation and sharing in the library context. For example, the Ohio University Library made a collection of business information resources editable by both patrons and librarians. This research portal facilitates collaboration between librarians and patrons as well as among patrons (Chu Kai-Wahl 2009). An example of collaboration among patrons is observed at the Columbia University Library's Wiki that offers student-developed projects on social justice movements. In this case, students interview social movement-related experts and movement participants and then

report the findings on the library Wiki. This project aims to encourage students to discover knowledge on social movements and share it with the community (Chu Kai-Wahl 2009).

Productivity applications such as RSS feeds and Tagging are also used to enhance KM practices in academic libraries. RSS feeds contribute to knowledge transfer by providing up to date information to users. In an organisational context, users can subscribe to work-related information and constantly receive customised, up to date information. Britt (2005) adds that library users can subscribe to academic publishers' digital libraries that offer an RSS Feed for each journal and reporting summaries of each new issue as it becomes available, thereby staying current with emerging knowledge in the field (Britt 2005). On the other hand, tagging or categorising is a way to organise information. For example, users can create a tag (label) for articles (e.g., Library 2.0- related articles, KM-related articles) and store the selected articles under the chosen category (Britt 2005). Library users provide a note that will remind them about the content of the article, so they can easily locate the information, trace their memory, and remember the content of the article.

Tagging is another way of personalising Web content; however, it differs from bookmarking because bookmarking simply stores links, while tagging lets users organise information and provide a small note for their memory trace. In addition, Web 2.0 tools such as Flickr for photos, Technocratic for Blogs, and del.icio.us for Websites offer tagging functions. The tagging functionality is critical for KR and trace memory because it provides a way to keep track of the platforms visited by knowledge workers (Hislop 2013; Hosseini and Hashempour 2012; Kim and Abbas 2010; Levy 2009; Penzhorn 2013). When users tag in the library setting, they contribute keywords that characterise the resource(s) they are tagging. Their tags can relate to the subject content of the resources, their opinion of a specific book, or keywords to aid their memory trace. Within the diverse knowledge community of academia, tags may be contributed by students, faculty, or others associated with the university, as well as those users who visit the library's OPAC (Harinarayana and Raju 2010; Kim and Abbas 2010; Mendes, Quinonez-Skinner and Skaggs 2009). This rich combination of shared knowledge in the form of tags results in a Folksonomy, or a set of terms, that can then be used by the knowledge community to describe the resources in the library (Hosseini and Hashempour 2012; Kim and Abbas 2010; Penzhorn 2013).

The study findings have provided the application of sharing sites such as SlideShare, Dropbox and GoogleDocs as among the Web 2.0 tools categories used to enhance KM practices in academic libraries. These sites enable people to share their knowledge. For example, Google Docs is another Web 2.0 services provided by Google to facilitate knowledge creation and sharing practices among the group of

users. Chu and Kennedy (2011) add that allows users to create word processing, spreadsheet and presentation applications that are web-hosted and can be remotely accessed by any authorised user. Moreover, documents can be edited simultaneously by multiple users, stored in an online storage space and shared through some appropriate features.

## **6.8 Knowledge creation and sharing practices through Web 2.0 Driven SECI Model**

Knowledge creation and sharing practices can also be facilitated by the application of Web 2.0 Driven SECI Model. Web 2.0 Driven SECI Model was used in this study to link the activities proposed by the normal SECI Model with Web 2.0 tools such as Facebook, Twitter and Blogs to enhance knowledge creation and sharing. Shang et al. (2011) add that although people goes through SECI processes, Web 2.0 services have been developed to provide ways to support different stages in this process. Therefore, the following sub-sections provide the activities conducted under SECI processes in the light of Web 2.0 tools:

### **6.8.1 Socialisation process**

The majority of respondents reported that through the use of Web 2.0 tools such as Skype people can share their experiences and understanding about various activities conducted in the library. Respondents reported sharing and communicating knowledge by using Google Talk and Skype. Shang et al. (2011) that people can share and communicate their experiences, skills and understanding by using various Web 2.0 tools such as Wikis, Facebook, Skype, and Google Talk. The present study has indicated the need for further investigation on the use of such tools to enhance knowledge creation and sharing practices.

### **6.8.2 Externalisation process**

The study findings have revealed that the majority of the respondents captured personal knowledge by using Blogs and Wikis. The study findings have also indicated that people can write and share knowledge through Blogs, Wikis and Skype. Shang et al. (2011) indicate that personal knowledge can easily be captured by using Wiki and then stored for future use. The study has reported that when people use Web 2.0 tools such as a Wiki and Google Talk they can be motivated, and therefore, contribute their knowledge and hence make such knowledge available to the entire community.

Web 2.0 tools are used to conduct CAS services and to announce some of the new activities which could be conducted in the library. This study has reported that academic libraries need to conduct the departmental meeting through the use of Web 2.0 tools such as Skype whereas library staff could participate and share their views on certain issues. Web 2.0 functionalities such as content editing and co-

development provide platforms for co-creation among participants, as well as, enabling knowledge internalisation through reflection on what has been learned (Shang et al. 2011).

### **6.8.3 Combination process**

Knowledge is created and shared knowledge through making up content via the use of Mashups (the combination of more than one Web 2.0 tools such as Blogs and Google Docs). Web 2.0 tools such as Folksonomies are used to manage collaboration within academic libraries whereby library users could be linked and collaborate their knowledge among themselves (Shang et al. 2011). Further, Web 2.0 tools such as RSS Feeds facilitate knowledge creation and sharing practices (Shang et al. 2011).

### **6.8.4 Internalisation process**

The use of Web 2.0 tools such as Wikis and Blogs help individuals to receive feedback from their knowledge they contributed. Further, sharing of best practices can be facilitated by the use of Facebook, Skype and Twitter. On the other hand, learning activities could be enhanced through content editor and co-development through the use of Wikis. A similar finding was indicated by the study of (Shang et al. 2011).

The emergence of Web 2.0 tools such as Wikis can be used to enhance respondents in the creation and sharing knowledge under SECI processes. Shang et al. (2011) explain that Wikipedia is an encyclopaedia collaboratively written to assure quality, it offers standardised procedures for users to edit content. Therefore, to enhance the reliability, all editors must register as members to offer opinions on the correctness of any published article. To build traceability, all changes are recorded in the article histories and change logs. Inappropriate changes are quickly removed, and repeat offenders can be blocked from further editing. One of the advantages of using the combination of SECI processes and Web 2.0 tools is to facilitate knowledge creation and sharing practices is on customer value; where user learning processes can benefit from Web 2.0 features; this is enhanced through sharing, assimilation, regeneration, reinterpretation, and retention of knowledge and user skill upgrades (Shang et al. 2011).

## **6.9 Factors that affect the application of Web 2.0 tools to enhance KM practices**

In this study Web 2.0 tools such as Facebook, Twitter, Blogs, RSS Feeds, Google Docs and YouTube were regarded as KMS used to enhance the creation and sharing of knowledge in academic libraries in Tanzania. The study adopted KMS Success Model developed by Jennex and Olfman (Jennex and Olfman 2003), which was then modified to fit this study. Prior to analysing the data, data screening was conducted to determine if there is any violation of the assumptions. KMO measure of sampling adequacy was 0.84 which is above the limit of 0.6 (Hair et al. 2010). Kaiser's criterion and screen plot resulted into

six-factor solution accounting for 75.80% of the total variance, which was moreover consistent with the literature. Factor one has six items representing system quality. Factor two is composed of seven items representing the knowledge quality. Factor three is composed of seven items representing service quality. Factor four is composed of five items representing an intention to reuse the system. Factor five is composed of five items representing user satisfaction. Factor six is composed of five items representing net benefits. Therefore, the six-factor solution with 35 items was considered for CFA.

The estimation of the measurement model through CFA was a prerequisite in validating the structural model (Hair et al. 2010). Upon subjection of the measurement items to CFA, the initial results have indicated that all the model-fit indices showed good-fit for measurement model; therefore, the measurement model was adopted for SEM as recommended by Hair et al. (2010). The measurement model was further assessed for convergent validity of scale items by using three criteria: reliability, CR, and AVE. According to Hair et al. (2010), reliability is an assessment of the degree of the consistency between multiple measurements of a variable. Reliability of factors was estimated by assessing the Cronbach's  $\alpha$  and factor loadings from the CFA. Thus, Cronbach's  $\alpha$  coefficient for each aspect was examined. Hair et al. (2010) provide that the rule of thumb for reliability estimation of 0.7 or higher, suggests good reliability. However, the reliability between 0.6 and 0.7 can also be accepted, provided that, other indicators of the model's construct validity are good (Hair et al. 2010). In this study, Cronbach's  $\alpha$  alpha coefficients of the all six constructs have ranged between 0.6 and 0.8 which indicate that the instrument adopted for the study was highly reliable.

Accordingly, convergent and discriminant validity were established. Convergent validity was evaluated by examining the factor loadings from the CFA. Composite reliability was measured by assessing the internal consistency of the measurement model. According to Fornell and Larcker (1981), all indicator factor loadings should be significant and exceed  $> 0.7$ . Thus, all factors in the measurement model had adequate reliability and convergent validity. Convergent validity was also evaluated using by CR and AVE. CR assessed the internal consistency of the measurement model. The recommended thresholds for CR is 0.70 or above, and an AVE of more than 0.50, then construct internal consistency is evidenced (Hair et al. 2010). The findings showed that the composite reliability (CR) ranged between 0.6 and 0.8 which shows that the research model can be considered to have acceptable convergent validity.

On the other hand, the discriminant validity assessed the extent to which a concept and its indicators differ from another concept and its indicators (Bagozzi, Yi, and Phillips1991). Fornell and Larcker's (1981) explain that when the square root of the average variance extracted is greater than its correlations

with all other constructs it means that discriminant validity has been established. The study findings indicated that all of the square roots of the AVEs were greater than the correlations between the construct and any other construct in the model. This is satisfying Fornell and Larcker's (1981) criteria for discriminant validity (Bagozzi, Yi, and Phillips 1991). In addition, the AVE according to Hair et al. (2010) should be 0.5 or greater to suggest the adequate convergent validity. In this study, all the six constructs indicated the AVE of 0.5 and 0.6 which shows that the measurement model in this study can also be considered to have acceptable convergent validity. In other words, both CFA and measurement model in this study had adequate reliability, convergent validity and discriminant validity.

SEM was conducted to verify if it supports the variables indicated in this study. Hair et al. (2010:609) add that SEM is a family of statistical models that seek to explain the relationships among multiple variables. The same set of goodness-of-fit indices employed for measurement model were also employed to observe the structural model. The findings revealed that there is a large difference between model fit indices of CFA and SEM models; therefore the model respecification was done basing on the assessment of the modification indices and standard residuals.

Model respecification according to Hair et al. (2010:608) is the modification of an existing model with estimated parameters to correct for inappropriate parameters which are encountered in the estimation process as well as to create a competing model for comparison. Therefore, modified SEM was then re-conducted after model respecification process, and when compared to modified SEM and CFA models, the results showed no significant difference. This means that the modified SEM has excellent model fit as compared to the original model. Thus, the researcher decided to continue with the modified SEM.

The study has proposed nine relationships. However, after model respecification, three new relationships emerged H10: Service quality has a positive effect on net benefits; H11: Knowledge quality has a positive effect on net benefits in the Web 2.0 context; and H12: System quality has a positive effect on net benefits in the Web 2.0 context. In this study, net benefits were regarded as a dependent variable, while the rest of the constructs service quality, knowledge quality, system quality, user satisfaction and intention to reuse, were regarded as independent variables.

Wu and Wang (2006) suggest that variables should be dependent that is surrogate measures for success. The standardised path coefficient indicates the strengths of the relationships between the independent and dependent variables. The findings indicated significant support for the KMS success model to enhance



KM practices in academic libraries in Tanzania. In this study seven out of the twelve hypotheses were supported as explained below:

### *Service quality*

The study findings have indicated that service quality had the strongest direct effect on user satisfaction than any other determinants within the model. A similar finding was revealed by a study done by Petter and McLean (2009). Masrek, Jamaludin, and Mukhtar (2010) also indicated that service quality is positively associated with user satisfaction. In addition, Kettinger and Lee (1994) suggest that service quality is positively and significantly related to user satisfaction in information services. This study finding provides that academic libraries, as well as librarians, need to ensure a reliable service quality to enhance the application of Web 2.0 tools, thus to satisfy the users' needs.

On the other hand, service quality had the strongest positive effect on the intention to reuse the system. A similar finding was obtained from a study done by Petter and McLean (2009). Therefore, this study has indicated that, if Web 2.0 tools will provide reliable services, it will increase the intention to reuse the system among library staff.

The study findings have indicated that service quality played a key role in driving users' usage intention (H1 and H4). Therefore, library staff should struggle to enhance the overall service quality of their Web 2.0 tools to increase user's usage intention. Students are the major readers and contributors of the online content on Web 2.0 platform. Therefore, increasing their usage intention helps enrich the content of the Web 2.0 platform. In addition, academic libraries should provide reliable Web 2.0 services, provide prompt assistance to user's queries and demands, ensure trust and confidence and offer individualised attention to library users to use the system. Academic libraries should also identify skilled librarians to manage Web 2.0 services in addition to their normal job responsibilities to ensure high quality of the services. In addition, library staff should also take the advantage of a wide range of Web 2.0 functions and services to strengthening user's usage intention, especially students.

The study findings have also indicated that service quality had no significant effect on net benefits. The study finding was inconsistent with other IS studies' findings. For example, studies conducted by Lwoga (2013), as well as Petter, Delone, and Mclean (2008), indicate the relationship between service quality and net benefits. Lwoga (2013) adds that, among the three quality-related constructs, service quality had the strongest total effect on perceived net benefits and intention to reuse the system. On the other hand, Chua and Goh (2010) found that the presence of Web 2.0 applications was found to correlate to the

overall quality of the library website, where the association was strongest with service quality. It is, therefore, indicated that although the study finding did not indicate the direct relationship between service quality and net profits, there is a need for academic libraries to improve their service qualities in the Web 2.0 context. This is due to the fact that service quality enhances the use of the system (Web 2.0 tools) to provide net benefits within the academic libraries.

### ***Knowledge quality***

The study findings have provided that knowledge quality had no significant on user satisfaction. Therefore, this study finding was inconsistent with the findings obtained in other IS and KMS studies. For example, a study conducted by Rai, Lang, and Welker (2002) found that knowledge quality is significantly related to user satisfaction in the IS system. Academic libraries, therefore, need to improve the quality of knowledge stored to attract more library users to use it. This could be facilitated by the establishment of KR in such libraries.

Further, the study findings have indicated that knowledge quality had no significant effect on the intention to reuse the system. Consistent findings were revealed by other studies done by McGill, Hobbs, and Klobas (2003), as well as Livari (2005), which found that knowledge quality is not significantly related to intention to use the system. However, this study finding is inconsistent with the study done by Halawi, McCarthy and Aronson (2008) which provided that information (or knowledge) quality is significantly related to intention to reuse the KMS success model. Therefore, academic libraries need to improve the knowledge quality before it is uploaded to the Web 2.0 tools, thus, to attract more library users to use Web 2.0 tools more and more. In addition, library staff and library users need to create and share knowledge to improve the knowledge quality to enhance the intention to reuse the system (Web 2.0 tools).

However, this study did not provide the direct relationship between knowledge quality and intention to reuse the system (H5), library staff should focus on enhancing knowledge quality to raise user satisfaction in the Web 2.0 application. Relevance, accuracy, timeliness and completeness are the main factors leading to the success of Web 2.0 applications. Library staff should also develop means to monitor online content to ensure good quality of knowledge including user-generated content. The intention to continue using Web 2.0 services can increase due to a high level of user satisfaction, and thus be able to account for high investment costs involved in developing and maintaining the Web 2.0 services. Lastly, the usage of Web 2.0 can also improve when the system quality is in place to enhance user satisfaction and continuance

usage of Web 2.0 services. In addition, library staff should also ensure that the Library 2.0 services are reliable, available and user friendly to encourage users to reuse the system.

The study findings have indicated that knowledge quality had the strongest direct effect on net benefits. Consistent findings were revealed by other studies as follows: Gatian (1994) found that knowledge quality was related to decision making efficiency, Shih (2004) found that knowledge quality is associated with quality of time and decision making, and Bharati and Chaudhury (2006) found that knowledge quality has significant effect towards the decision making. Therefore, this study provides that an increased knowledge quality would be associated with the net benefits.

In this study, the net benefit is the outcome or effect which the system brings to both an individual and organisation after the full implementation and usage of KMS Success Model. Petter, Delone, and Mclean (2008) add that there is moderate support for the positive impact of information quality on individual performance. Gatian (1994) adds that knowledge quality is related to decision making efficiency. Shih (2004) adds that knowledge quality has also been found to be associated with quality of work and time saving. Therefore, there is a need to improve knowledge quality to have the positive impact on both the individual and the organisation.

### ***System quality***

The study findings indicate that system quality had no significant effect on user satisfaction. Karlinsky and Zviran (2012) also indicate that there is no relationship between system quality and user satisfaction. On the other hand, the study done by Jennex, Smolnik, and Croasdell (2007) view that the extent of the system use alone is not considered as a good measure of KMS success of the greater importance are the quality of that use and intention to use.

The study findings were inconsistent with other studies of Halawi, McCarthy, and Aronson (2007), Kulkarni, Ravindran, and Freeze (2006), Livari (2005), and Wu and Wang (2006) which found the positive relationship between the system use and user satisfaction. However, Fitzgerald and Russo (2005) suggest that with the improved system quality was or might positively relate to subsequent system use. Therefore, there is a need for academic libraries to improve the system quality to enhance user satisfaction in the use of Web 2.0 tools.

The study findings have indicated that system quality had no significant effect on the intention to reuse the system. Similar findings were obtained from the studies done by Klein (2007), as well as of McGill,

Hobbs and Klobas (2003), which found that system quality is not significantly related to intention to reuse the system. Jennex, Smolnik, and Croasdell (2007) also found a negative effect on the use of system quality to enhance intention to use the system. The study of Wu and Wang (2006) suggest the need to increase the system quality to enhance the intention to reuse the KMS. However, this study did not indicate the direct relationship between system quality and intention to reuse the system, there is a need for academic libraries to increase the effectiveness of Web 2.0 tools (system quality) to increase the intention to reuse the system. This study provides the need to employ system administrators to improve the system quality in place through customisation and updating processes. In addition, Wu and Wang (2006) suggest that system quality depends on the intended operational characteristics which are concerned with whether there are errors in the system, its ease of use, responsive time, flexibility and stability.

The study finding also indicates that system quality had the strongest direct effect on net benefits. Similar findings were obtained by the studies done by Devaraj, FAN, and Kohli (2002), Hong et al. (2001), Hsieh and Wang (2007), Wixom and Todd (2005), and Yang and Yoo (2004). It is, therefore, important for accurate and correct knowledge to be used by the right person at the right time and in the right context.

### ***User satisfaction***

The study findings have indicated that user satisfaction had the strongest significant effect on the intention to reuse the system (Web 2.0 tools). Similar findings were obtained from the studies done by Bharati and Chaudhury (2006), Chiu, Chiu and Chang (2007), Halawi, McCarthy and Aronson (2007), Kim et al. (2002), McGill, Hobbs and Klobas (2003), and Wu and Wang (2006) who found strong relationship between user satisfaction and intention to reuse the system.

User satisfaction is very critical to the use of any KMS within the organisation. This is because a user needs to be satisfied with the system which they are going to use, as well as, the value and benefit which such a system could bring to the organisation. After being satisfied, users might increase their intention to reuse the system for the benefit of their organisations and increase their job performance to provide better services to users. Therefore, user satisfaction plays a major role in the management of Web 2.0 tools and the services they provide to a library. The study has also revealed that user satisfaction affects service quality.

On the other hand, the study findings have indicated that user satisfaction had the strongest direct effect on net benefits. A similar finding was obtained from a study done by Livari (2005) which found the strong effects between user satisfaction and net benefits. User satisfaction has the strongest association with the following net benefits: user's job (Guimaraes and Igbaria 1997); improve job performance (McGill, Hobbs and Klobas 2003); increase productivity and effectiveness (Halawi, McCarthy, and Aronson 2007; Rai, Lang, and Welker 2002; McGill and Klobas 2005); improve decision making (Vlahos, Ferratt, and Knoepfle 2004); and to enhance job satisfaction (Morris, Marshall, and Rainer 2002).

### ***Intention to reuse***

The study findings have indicated the relationship between intention to reuse the system and net benefits. Halawi, McCarthy, and Aronson (2007) add that there is a significant relationship between intention to reuse and net benefits measured by improvement in the job performance. Further, Petter et al. (2008) indicate that intention to reuse the system is positively associated with improved decision making. This study is, therefore, proposes that intention to reuse the system could lead to the net benefits in terms of good services thus attract more users to use the Web 2.0 tools available in the library.

## **6.10 Challenges that hinder the application of Web 2.0 tools to enhance KM practices in academic libraries**

The study findings have provided the challenges which hinder the application of Web 2.0 tools to enhance KM practices. The challenges in this study have been divided into two major groups: challenges which hinder the application of KM practices in academic libraries and challenges which hinder the application of Web 2.0 tools to enhance the application of KM practices in academic libraries. Therefore, the following sub-sections provide those challenges as follows:

### **6.10.1 Challenges which hinder the application of KM practices in academic libraries**

The study findings have provided that among the major challenges facing academic libraries so far include insufficient budget, lack of resources, poor ICT infrastructure and inadequate Internet connectivity. However, an insufficient budget was the major challenge in academic libraries. Similar observations were made on other studies done by Jain (2007), Maponya (2004), Raja, Ahmad, and Sinha (2009), Roknuzzaman and Umamoto (2009), and Wen (2005). Jain (2007) explains that due to budgetary constraints, academic libraries are not well-equipped with an essential infrastructure to facilitate the application of KM practices. Budget decline features twice as a reason to adopt KM, as well as, a challenge to practice KM. It is a well-known that unlike the private or business sector (Jain 2007;

Maponya 2004; Raja, Ahmad and Sinha 2009), academic libraries typically do not have extra financial resources to enhance KM application (Jain 2007; Maponya 2004; Raja, Ahmad, and Sinha 2009; Roknuzzaman and Umemoto 2009; Wen 2005).

The budget has an impact on everything including inadequate tools and technologies, lack of the rewards, poor training plans, and lack of expertise in KM. However, with the limited budget, academic libraries need to increase their operational efficiency to meet various challenges including the application of KM practices to better serve the entire community (Maponya 2004; Roknuzzaman and Umemoto 2009; Wen 2005). Wen (2005) adds that in recent years, funds provided in most academic libraries are stagnant at best and declining in general. Wen (2005) suggests that when libraries facing tight budgets or budget reductions, it is only too natural for the library administration to hesitate to invest other important things in enhancing the application of KM practices.

Lack of skills and knowledge in KM practices were related to the low application of KM practices in academic libraries. This study has indicated that lack of KM training programs is among the reasons for inadequate KM skills among the majority of the respondents. Maponya (2004), Roknuzzaman, and Umemoto (2009), and Ugwu and Ezema (2010) add that librarians lack KM skills to integrate KM practices in their libraries. It is evident that the majority of the academic library managers do not understand the concept of KM properly and there is a great misunderstanding of the KM concept among library staff. Therefore, they might not be able to appreciate and support the KM projects (Jain 2007; McKnight 2007; Raja, Ahmad, and Sinha 2009; Roknuzzaman and Umemoto 2009).

Sarrafzadeh, Martin, and Hazeri (2010) add that the challenges for most of LIS professionals lie in applying the skills and competencies used in managing information and knowledge. Few respondents in this study reported receiving KM training through self-studies. This programme might help library staff to gain KM skills; however, they still need more formal training on how to implement KM practices in academic settings. Attending KM training through formal programmes is encouraged.

Sarrafzadeh, Martin, and Hazeri (2010) add that if library staff remain reluctant to gain new skills, they will become irrelevant to their organisation to enhance KM practices as well as to perform other duties. The focus of KM practices is more on human as well as organisational issues, different types of skills and competencies are needed for library practitioners to work in KM environment. Jain (2007), as well as Raja, Ahmad, and Sinha (2009) report that the success of KM practices are dependent on adequate

training plans in all the activities in the KM process which involve training in knowledge capture, organisation, dissemination, and use of new technology skills.

The study findings have indicated the lack of KM policy and guidelines to guide the application of KM practices in academic libraries. The study observed few library policies with few components of KM practices which might not be easily understood by the majority of the respondents. Lack of KM policy was among the major challenges that hinder the application of KM practices in most academic libraries worldwide (McKnight 2007). Similar observations were reported from the studies of Jain (2007), McKnight (2007), Raja, Ahmad, and Sinha (2009), and Roknuzzaman and Umemoto (2009).

Jain (2007) adds that KM policy is the first step in any KM initiative. However, most of the academic libraries lack a centralised policy for KM initiatives. KM policy helps the organisation to manage its knowledge for the benefit of the entire organisation, employees and stakeholders. Based on the real needs and problems in a particular library, KM policy should specify the overall KM vision aligned with organisational strategic plans including specific objectives, action plans, budget, mentoring and training plans and associated challenges including an evaluation plan to measure the expected outcomes of KM initiatives (Jain 2007; McKnight 2007; Raja, Ahmad, and Sinha 2009; Roknuzzaman and Umemoto 2009). Thus, clearly defined KM policy and guidelines are essential to bring the benefits from KM implementation.

The study findings have indicated the lack of management support being among the critical challenges that hinder the application of KM practices in academic libraries. Management support is regarded as an organ which can decide what to do; thus, academic libraries need to establish a good relationship with their management to be assisted in KM application. Other challenges which are directly avoided through management support include lack of a knowledge sharing culture, inadequate technologies and ICT infrastructure, lack of motivation to participate in KM practices, and the lack of reading materials in the libraries.

The study findings have reported the lack of ICT infrastructure to support the application of KM practices in the academic libraries. It is also reported that ICT infrastructure is decisive for KM application (Arora 2002). Among the advantages of ICT infrastructure to enhance KM practices include: to facilitate rich forms of communication and collaboration between people who are physically dispersed, to facilitate interpersonal communication and collaboration, and to facilitate the creation of virtual communities of practice (Hislop 2013:211).

Knowledge sharing has been identified as the most critical area in KM practices. However, knowledge sharing is considered as the most prominent challenge compared to other components of KM because it is very difficult to encourage people to share their knowledge (Gupta 2008; Hendriks 1999; Jantz 2001). KM practices, as well as, knowledge sharing are well supported if there is a knowledge sharing culture in place. White (2004) adds that “KM programmes generally fail if there is no knowledge-sharing culture in place”. Therefore, a well-established knowledge sharing culture could facilitate the application of KM practices especially knowledge sharing component. The study has also reported the lack of organisation culture among the visited libraries. Lack of organisation culture that supports the implementation of KM practices was observed in most libraries visited. However, the majority of the respondents seemed loyal and committed to their work which indicates potential to create a strong sense of collective organisational identity. Therefore, academic institutions need to employ organisation culture which integrates KM practices.

The study has observed the lack of time among library staff due to minimum time they have to participate in KM practices. Similar observations were indicated by the study done by Parirokh, Daneshgar, and Fattahi (2008), and Mostofa and Mezbah-ul-islam (2015), indicate lack of leadership and dedication of time, lack of communication channels, lack of formal procedures including publication of manuals for staff and documenting experiences. Even though ignorance was mentioned among library staff, this study did not observe direct ignorance towards the application of KM practices among the libraries visited.

O’Dell and Jackson (1998) explain that ignorance, lack of time, lack of relationship between source and receipt of knowledge, listen and help one another and time lag taken to implement best practices recommended across departments need also to be considered.

### **6.10.2 Challenges that hinder the application of Web 2.0 tools to enhance KM practices**

There is a lack of application of Web 2.0 tools so as to enhance KM in the majority of academic libraries. Respondents mentioned various challenges which hinder the application of Web 2.0 tools to enhance KM practices in academic libraries. The majority of the respondents reported that learning new tools was not given priority. Another challenge mentioned by the respondents was an inability to master technology – “some old excuses”. These two challenges indicate how library staff ignores the functionalities which Web 2.0 tools could bring to their libraries.



The study has noted that ignorance was among the challenges that hinder the application of Web 2.0 tools and KM in academic libraries. Most of the academicians still ignore the functionalities of Web 2.0 tools in the academic environment and said that Web 2.0 tools are for social communication. Berners-Lee (2006) describes Web 2.0 tools as a piece of jargon, difficult to understand. Berners-Lee (2006) further criticises Web 2.0 by stating “nobody really knows what it means. If Web 2.0 for you is Blogs and Wikis, then that is people to people. But that was what the web was supposed to be all along.”

The study findings have reported that the lack of skills and knowledge on the access and use Web 2.0 tools to enhance KM practices could also hinder the application of Web 2.0 tools to enhance KM practices in academic libraries. The study also findings indicate that the majority of respondents were frequent users of the new technology but the lack of technological skills and technophobia (fear of technology) might be the reasons for not applying Web 2.0 tools in the academic libraries. Raeth et al. (2010) note that the adoption and usage of Web 2.0 depend much on training, communication, and advocacy aiming at awareness creation on the usefulness of the tools.

Munatsi (2010:255) reports that library staff lacks relevant knowledge, competencies and skills for the implementation and utilising Web 2.0 systems in their libraries. However, the majority of them are using these tools for their practical issues which on one way or another is a good starting point of implementing them in their libraries. The study done by Muneja and Abungu (2012) explain that both library staff and library users are struggling to acquire skills for effectively utilise and use Web 2.0 tools for creating online catalogues, social bookmarking, collaborating and sharing content. Adoption and usage of Web 2.0 also depend much on literacy level of using such tools for communication and other activities. Woldofa (2014) adds that among the challenges of using Web 2.0 in most of the African libraries include lack of technical knowhow.

Reluctant to change from the traditional way of providing library services to technological means is also among the challenges that hinder the application of Web 2.0 tools to enhance KM practices in academic libraries. Munatsi (2010) adds that library and information professionals in the African academic and research libraries have not taken the right initiatives and strategies to develop, implement and integrate Web 2.0 tools to improve their services. This leads to the low level of the application of Web 2.0 tools to enhance library services in academic libraries. In the present highly dynamic and versatile information environment, university libraries in Africa still maintain the old traditional practices of managing and handling information services instead of using modern methods. In addition, most of these libraries are

still struggling with the dream of realising full automation of information services. In traditional libraries, the librarian manages the information services with little participation from the user population.

The study has observed the lack of ICT facilities such as monitors, Uninterrupted Power Supply (UPS), printer and photocopiers in academic libraries. Similar findings were obtained from the study conducted by Akeriwa, Penzhorn, and Holmner (2015), Kwanya, Stilwell, and Underwood (2012), Lwoga (2014), Makori (2012), and Penzhorn and Pienaar (2009) which report that lack of ICT infrastructure and facilities are regarded as the major challenge facing most of the academic libraries today.

The study has observed low Internet connectivity; unstable power; tools; conservative culture and natural lag in adopting new technology; and ignorance or lack of appreciation of the some of the uses of Web 2.0 tools in the academic environment. Unstable internet connectivity and lack of enough bandwidth to support the application of Web 2.0 was also reported as the challenge which hinders the application of Web 2.0 in higher learning institutions. Similar findings were reported by the studies conducted by Makori (2012), Muneja and Abungu (2012), and Penzhorn (2013).

The study observes power cut off in several times in majority of academic libraries visited. The study also observed the lack of standby generators and other power supply devices in case of power cut. Similar observations were reported by the studies of (Muneja and Abungu 2012; Penzhorn 2013) that the majority of African libraries lack reliable power supply to facilitate the application of Web 2.0 tools.

Lack of security and privacy in the majority of Web 2.0 tools were also reported by the majority of respondents. Lack of reliable control in the most of Web 2.0 tools brings fear to most of the people to add their information/knowledge. The study has reported that some people can misuse information by editing, rewriting, and deleting, thus, to lose the meaning of the information uploaded by someone. Penzhorn (2013), as well as Schlenkrich and Sewry (2012), add that lack of privacy and security are among the major problems which hinder the use of Web 2.0 tools especially for academic purposes. Schlenkrich and Sewry (2012) add that some people avoid using Web 2.0 tools due to lack of privacy and security.

Foo, Majid, and Logan (2002) suggest the need to improve computer security through password and identification addresses. Upon successful authentication, users have access to a whole range of electronic resources and services without having to remember individual passwords (Foo, Majid and Logan 2002; Munatsi 2010). Other challenges include lack of enough resources including human resource personnel

and capital, lack of resources, traditional management practices, poor planning initiatives, lack of patron focus, intellectual property rights, lack of Web 2.0 knowledge and skills, and security concerns.

## **6.11 Chapter summary**

Chapter Six has discussed research findings in accordance with research objectives and research questions. Only important findings were discussed and some of them were merged. The study findings indicated that despite the high level of using Web 2.0 tools among respondents. The study findings revealed that application of Web 2.0 tools to enhance KM practices in academic libraries is still low and unplanned. Most of the respondents reported having more than one individual account on various Web 2.0 tools. Despite the availability of websites in most of the academic libraries visited, most of such websites were out of date and most of them they do not have a link to Web 2.0 tools. The application of Web 2.0 to improve the services provided by the academic libraries were also presented and recommended.

Despite the advantages of KM practices in academic libraries, the application of KM in academic libraries is still low and unplanned. Most of the academic libraries seem to practice KM unknowingly. The application and benefits of KM practices were not well known and communicated among library staff. The study noted the lack of KM enablers for the application of KM in academic libraries. Lack of KM enablers such as KM training, IT infrastructure, management supports, competencies and skills, and KM policy and guidelines were noted to hinder the application of KM practices in academic libraries. Some of these KM enablers were also reported as among the challenges that hinder the application of Web 2.0 tools to enhance KM practices in academic libraries.

Knowledge Creation Theory (SECI processes) was employed to support the creation and sharing of knowledge in academic libraries. Various activities were presented under SECI processes which are very important to enhance the creation and sharing of knowledge in academic institutions. The study findings revealed the high level of activities mentioned under SECI processes in the majority of the academic libraries. Categories of Web 2.0 tools used to enhance KM practices were presented and discussed.

Web 2.0 tools Driven Model employed to explain the creation and sharing knowledge through the application of SECI processes and Web 2.0 tools. The study identified and mentioned various activities which could be performed under SECI processes and Web 2.0 tools. On the other hand, KMS Success Model was used to explain the factors that affect the application of Web 2.0 tools to enhance KM practices in academic libraries. The KMS Success Model was adopted from Jennex and Olfman KMS

Success Model and then modified to fit in this study. In this study, Web 2.0 tools were regarded as KMS. Seven out of twelve proposed hypotheses were supported and they have indicated the acceptance of KMS Success Model to explain the application of Web 2.0 tools to enhance KM practices in academic libraries settings.

## CHAPTER SEVEN

### SUMMARY OF THE STUDY FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

#### 7.0 Introduction

The findings of this study are presented in Chapter Five, whereas Chapter Six has dealt with the interpretation of these findings. Thus, this chapter outlines the summary of the study findings, conclusions and recommendations. The last part of this chapter identifies the areas for further research.

Bunton (2005), as well as Fassan (2006), advise that this chapter must be structured to include the following: summary of the findings, conclusion according to the objectives of the study, recommendations, and implications of the findings.

#### 7.1 Summary of the findings based on research questions

This section presents a summary of the research findings based on the objectives of the study as presented in Section 1.5 of Chapter One.

##### 7.1.1 Summary of the general information of the study

The general overview of the study is summarised as follows:-

- (a) Background information of respondents included: gender, age groups, working location/section, working department/section and rank;
- (b) Respondents 254 (91.36%) participated in quantitative approach while respondents 57 (82.6%) participated in qualitative approach through semi-structured interviews;
- (c) More male respondents participated in this study than female respondents in both surveys;
- (d) Age group for the majority of the respondents who participated in the quantitative approach was between 21 to 30 years; while for respondents who participated in the qualitative was between 41 to 50 years;
- (e) Eight out of twelve academic libraries from public universities were involved in this study;
- (f) Three quarters of respondents who participated in quantitative data collection were administrative staff;
- (g) Half of the respondents participated in quantitative data were working in readers' service departments;

- (h) The study employed multi-method approach whereby quantitative approach was the dominant approach; and
- (i) A questionnaire was employed to collect quantitative data (from normal library staff); while both semi-structured interviews (for senior library staff) and observation methods were used to collect qualitative data.

### **7.1.2 Summary of the levels of KM awareness among respondents**

Summary of the levels of awareness of KM among respondents in academic libraries in Tanzania includes:-

- (a) Low level of KM awareness was observed among respondents;
- (b) One third of the respondents had adequate information about the KM concept;
- (c) Half of the respondents, who participated in the survey, reported having attended KM training; while a quarter of the respondents who participated in semi-structured interview reported attending KM training;
- (d) Based on respondents who obtained KM training, two thirds of respondents surveyed admitted that they had obtained KM training through self-studies such as libraries, literature and from audio and video programmes; while a quarter of respondents participated in semi-structured interviews reported to obtain KM training from short courses such as seminars, workshops and certificate programmes; and
- (e) The study has observed some KM practices training among library staff in two of the selected libraries.

### **7.1.3 Summary of the KM enablers for the application of KM practices in academic libraries**

Summary of the KM enablers for the application of KM practices in academic libraries in Tanzania includes:-

- (a) A five-point Likert scale indicated the following KM enablers: competencies and skills, KM policy and guidelines, and organisational culture;
- (b) The respondents who participated in a semi-structured interview mentioned the following KM enablers which include IT infrastructure, KM training, rewards and motivation, management support, and KM policy and guidelines;
- (c) The study has observed the availability of library policies at ARU, SUA and MUHAS Libraries. In addition, the study observed the availability of MUIR at MU Library;

- (d) The study observed the availability of IT specialists in most of the libraries visited providing IT support to both library staff and library users;
- (e) The study has observed the availability of ICT facilities such as computers (laptops and desktops), printers, Wi-Fi devices and wired ports, telephones, photocopiers and amplifiers; however, most of such devices were not functioning.;
- (f) The study has observed some of the staff members sent to various LIS programmes through the support of their parent organisations. In addition, the study observed LIS programmes at MU and SUA libraries; and
- (g) The study has observed the training activities (information literacy learning (ILL) and library orientation) conducted by librarians in four of the academic libraries visited.

#### **7.1.4 Summary of the knowledge creation and sharing activities through SECI processes**

Summary of the knowledge creation and sharing practices through SECI processes in academic libraries are as follows:-

##### ***Socialisation process***

- (a) A five- point Likert scale provided the following results: gathering information from various library activities; sharing experiences with other library staff and library users and, preparing or set a permanent room where people can sit and socialise together;
- (b) Respondents who participated in semi-structured interview reported that the socialisation process might never be maintained in the learning environment such as in academic libraries because people are busy doing various academic issues;
- (c) The study has observed that library staff shared experiences and skills whereas senior staff guided junior staff on performing various library duties; and
- (d) The study observes special rooms in three of the selected academic libraries visited with few magazines; however such rooms were used as tea rooms.

##### ***Externalisation process***

- (a) A five-point Likert scale provided following results: conducting CAS, exchanging ideas and opinions with colleagues, and collecting information from inside and outside the library;
- (b) Respondents who participated in the semi-structured interview provided the following: engaging in various groups in the library to discuss developmental issues, participating in meetings, and sending alerts to inform the community on the arrival of new materials;
- (c) The study has observed departmental meetings among the libraries visited;

- (d) The study has observed a number of brochures and posters created by library staff in SUZA and UDOM Libraries and announcements on library issues created by staff in most of the selected libraries;
- (e) The study observes ongoing cataloguing and classification activities at MUHAS and UDSM Libraries; and
- (f) The study has noted the existence library policies in three libraries which explain and guide on the use of libraries and their resources.

### ***Combination process***

- (a) A five-point Likert scale reported the following results: facilitation, acquisition and integration of knowledge, development and creation of training materials, collecting external knowledge, writing library policies and guidelines, and writing strategic planning and operations;
- (b) The respondents who participated in a semi-structured interview provided the following responses: writing library annual reports, exchanging knowledge and ideas among library staff, conducting training to library users on how to utilise library resources, and classifying and cataloguing library materials and making them available for use by library users;
- (c) The study has observed ongoing library user training conducted by librarians in three of the visited libraries;
- (d) The study has observed ongoing technical services (cataloguing and classification of library materials) among the libraries visited;
- (e) The study has observed collection development activities such as acquisition, selection of books to be purchased and weeding in few of the visited libraries; and
- (f) The study did not observe the resource sharing activities in any of the visited libraries.

### ***Internalisation process***

- (a) A five-point Likert scale conducted provided the following results: learning and training activities, conducting SDI, and conducting surveys and sharing of the results;
- (b) The respondents who participated in a semi-structured interview provided the following responses presenting papers in various conferences, creating essential dialogues, learning by observing, and doing various library activities;
- (c) Teaching and learning activities were observed among the academic libraries visited;
- (d) Research and innovation were also observed which indicated the creation of new knowledge in such libraries;
- (e) The study has observed the lack of knowledge sharing culture among the selected libraries;



- (f) The study has observed training programmes (library orientation and/or information literacy training) which are conducted by library staff to enable library user to use library resources and to enable them to find, locate and use their needed information/knowledge; and
- (g) The study has observed library schools among the selected academic libraries which are conducted by library staff; for example MU, SUA and UDSM offer certificates, diploma, and degree in the library field.

### **7.1.5 Summary of the access and use of Web 2.0 tools in academic libraries**

Summary of the access and use of Web 2.0 tools in academic libraries in Tanzania includes:-

- (a) The majority of respondents were aware of the Web 2.0 tools and majority of them had personal accounts in various Web 2.0 tools;
- (b) The majority of the respondents were the frequent user of Facebook, WhatsApp and Twitter;
- (c) Male respondents were the main user of Web 2.0 tools as compared to female respondents;
- (d) Despite the fact that the majority of the respondents were the frequent user of various Web 2.0 tools, respondents who participated in a semi-structured interview reported that some of Web 2.0 tools were not user-friendly, therefore knowledge and skills are needed to use them;
- (e) Most of the academic libraries investigated had websites;
- (f) Despite the high level of familiarity and usage of Web 2.0 tools, respondents were not frequent users of their libraries' websites;
- (g) The study observes the availability of Web 2.0 tools in the following academic libraries' websites: Blogs, Twitter and Facebook at MUHAS and OUT Websites; Facebook and LinkedIn in SUA website; and Google Site in UDSM Website;
- (h) The respondents from SUA Library reported using SNAL WhatsApp for internal communication;
- (i) The respondents who participated in a surveyed questionnaire reported on the following uses of Web 2.0 tools in academic libraries: online communication and sharing of information, collaboration and participation among users, reference services, enhance scholarly communication, marketing and promoting library services, and sharing research findings;
- (j) The study has observed that MUHAS Library uses Blog to deliver health content, to post announcements and to market and promote library services;
- (k) The study has observed the availability of official computers connected to the Internet in most of the selected libraries and some of them were located in respondents' offices. The study has found lot of computers which were out of order (not working), a good example being ARU Library;
- (l) The study has observed that most of the websites were not updated for ages;

- (m) Both MU and SUZA Libraries showed the strongest significant effects on access and use of Web 2.0 tools as compared to other libraries; followed by UDSM Library;
- (n) Administrative staff showed the strongest significant effect on access and use of Web 2.0 tools as compared to academic staff; and
- (o) E-resources and ICT departments showed frequent access and use of Web 2.0 tools as compared to other departments followed by general circulation department.

### **7.1.6 The application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania**

Summary of the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania are:-

#### **7.1.6.1 The access and use of Web 2.0 tools to enhance KM practices in academic libraries**

- (a) A quarter of respondents who participated in the survey reported on the application of Web 2.0 tools to enhance KM practices in academic libraries. None of the respondents who participated in the semi-structured interview reported on the application of Web 2.0 tools to enhance KM practices; and
- (b) Web 2.0 tools were selected to enhance KM practices in academic libraries: video and audio sharing tools such as YouTube, social networking tools such as Facebook, Twitter and MySpace, and authorising tools such as Wikis, content management system and content sharing.

#### **7.1.6.2 Summary of knowledge creation and sharing practices through the application of Web 2.0 SECI Driven Model**

Summary of the knowledge creation and sharing practices through the use of Web 2.0 SECI Driven Model in academic libraries in Tanzania includes:-

##### ***Socialisation process***

- (a) A five-point Likert scale conducted provided the following results: sharing methods, understanding experience and skills through the use of Skype and Wikis, and communicating through Google Talk and Skype;
- (b) The respondents who participated in a semi-structured interview reported the following: sharing experiences, and communicating knowledge and ideas through Facebook; and
- (c) The study has observed the availability and use of Facebook in several library websites.

### ***Externalisation process***

- (a) A five-point Likert scale reported the following results: capturing knowledge through Blogs and Wikis, and sharing knowledge by using Skype, Blogs and Wikis;
- (b) The study has observed the availability and use of Blogs and Wikis in several library websites; and
- (c) The study has observed the uses of Skype among individuals in the visited libraries.

### ***Combination process***

- (a) A five-point Likert scale conducted reported on the following results: makingup the content through Mashups (the combination of more than one Web 2.0 tools).

### ***Internalisation process***

- (a) A five-point Likert scale conducted reported on the following results: communicating and receiving users' feedback through Wikis and Blogs, sharing the best practices through Facebook, Skype and Twitter, and learning by doing through the content editor, and co-development through Wikis; and
- (b) The study has observed the availability and uses of Facebook and Twitter at MUHAS Library.

## **7.1.7 Summary of the factors that affect the application of Web 2.0 to enhance KM practices in academic libraries**

- (a) Web 2.0 tools were regarded as KMS used to facilitate the KM practices in this study;
- (b) The study has adopted Jennex and Olfman KMS Success Model to investigate the factors that affect the application of Web 2.0 tools (or KMS as applied in this study) to enhance KM practices in the academic libraries in Tanzania;
- (c) The modified model was then renamed as KMS Success Model;
- (d) EFA was used for data screening and examination;
- (e) KMS Success Model employed six constructs which includes service quality, knowledge quality, system quality, user satisfaction, intention to reuse the system and net benefits;
- (f) The first-order CFA was conducted by using AMOS Version 23 to test the measurement model;
- (g) The common six model-fit indices were used to evaluate the overall goodness-of-fit for measurement model, SEM and modified SEM. The common six model-fit indices employed were: chi-squared normalisation by degrees of freedom ( $X^2/df$ ); the adjusted goodness-of-fit

index (AGFI); the non-normalised fit index (NNFI); the comparative fit index (CFI), the incremental fit index (IFI) and root mean square error of approximation (RMSEA);

- (h) The measurement model was further assessed for convergent validity of scale items, which was assessed by using reliability, composite reliability (CR) and the average extracted variance (AVE);
- (i) Reliability of factors was estimated by assessing the Cronbach's alpha and factor loadings from the confirmatory factor analysis. The Cronbach's alpha coefficient of the all six constructs indicates the model used for the study was highly reliable;
- (j) Convergent validity was further evaluated by examining the factor loadings from the confirmatory factor analysis;
- (k) The factor loadings of the items in the confirmatory factor analysis for the measurement model were greater than 0.5. Thus, all the factors in the measurement model had adequate reliability and convergent validity;
- (l) Discriminant validity was also applied in this study to assess the extent to which a concept and its indicators differ from another concept and its indicators;
- (m) The square root of the average variance extracted is greater than its correlations with all other constructs then discriminant validity has been established. All the six constructs indicated the AVE of 0.5 and 0.6 which shows that the measurement model in this study had an acceptable convergent validity;
- (n) Composite reliability (CR) ranged between 0.6 and 0.8 showed that the research model was considered to have acceptable convergent validity;
- (o) All diagonal values exceeded the inter-construct correlations, and thus, the results confirm that the research instrument had satisfactory construct validity. Therefore, CFA measurement model had adequate reliability, convergent validity and discriminant validity; and
- (p) There was a large difference between model fit indices of CFA and SEM models; therefore the model respecification was done basing on the assessment of the modification indices and standard residuals.
- (q) Out of twelve hypotheses, seven were supported. Table 7.1.1 indicates the standardised path coefficients;
- (r) Service quality had the strongest direct effect on users satisfaction and intention to reuse Web 2.0 tools in the academic libraries;
- (s) Knowledge quality and system quality had the strongest direct effect on the net benefits on Web 2.0 tools;

- (t) The net benefits had the strongest effect on users' satisfaction and intention to reuse Web 2.0 tools;
- (u) User satisfaction had the strongest effect on intention to reuse Web 2.0 tools; and
- (v) The standardised path coefficient indicates the strengths of relationships between the independent and dependent variables.

## **7.2 Conclusions**

Generally, conclusions of this study have derived from the research findings. According to Powell (1997:11) "the conclusion, obviously, depends on the truth of the premise.....". In addition, Leedy and Ormrod (2010:296) provide that "the conclusions should be entirely supported by the data presented". Further, in drawing conclusions, only major findings that addressed the research questions have discussed. The following sub-sections present the study conclusions.

### **7.2.1 Conclusion on the background of the respondents**

The study findings have indicated that the middle-aged respondents between 21 to 30 years participated in the survey while older aged respondents between 41 to 50 years participated in the semi-structured interview. Both middle and older aged library staff participated in the application of Web 2.0 tools to enhance KM practices in academic libraries. The preliminary analysis has confirmed that more male library staff participated in the study than female library staff in the sampled academic libraries. The gendered nature of the social, economic and policy systems in Tanzania, as in other African countries, may limit females especially those coming from rural areas to attend library schools and to work on libraries. Indicators are shown that males are more likely to attend development activities (such as education, library activities and application of ICTs for development) than females. Thus, more effort is needed to link gender issues in library programmes to ensure equal participation in the library activities.

Observations illustrated that the majority of the librarians are doing administrative work than academic work. This revealed that there are few academicians working in academic libraries in Tanzania than administrators. On the other hand, there are few library schools in Tanzania which make academicians perform normal library duties instead of academic works such as teaching, learning, research and innovation. There is thus a need to integrate librarianship and information studies in academic institutions to increase the number of qualified academic librarians. More academicians are still needed to conduct academic activities in various library schools and to perform other academic duties in academic libraries such as scientific writing, literature review, referencing, searching activities, information retrieve, access and use and personal KM.

### **7.2.2 Conclusion on the KM awareness among library staff**

The study has reported the lack of KM awareness among the majority of the respondents. Despite the fact that the application of KM is somewhat new, most of the academic libraries do not take it seriously but making all the efforts to apply KM practices to improve library services. KM practices have been conducted in the majority of the academic libraries unknowingly. On the other hand, the study has revealed the lack of KM enablers such as knowledge sharing culture, organisation culture, KM training, and management support.

The understanding of KM itself is not sufficient for the application of KM practices in academic libraries. There is a need for research and detailed assessment of library needs in terms of resources and training. Blair (2002) explains that successful KM practices require both ability to access stored information and knowledge among library staff “evaluate the ability and reliability of information obtained from unfamiliar sources” this may be an opportunity for LIS professionals to implement their expertise in information literacy training. The success of academic libraries depends on the capabilities and skills of its staff to serve the needs of the university community more efficiently and effectively. The new roles of academic libraries in the 21<sup>st</sup> century need to be as a learning and knowledge centre for their users as well as the intellectual commons for their respective communities.

The application of KM practices has the potential of enhancing the quality and value of services that the library provided. The study findings have established that knowledge in the majority of academic libraries was not well managed as well as preserved for future use; therefore, academic organisations need to integrate KM training programme in the LIS curriculum to equip library staff with more knowledge and skills in integrating and applying KM practices. Besides the fact that the findings have shown the effort of library staff in obtaining KM practices through self-studies, the study has provided the need to attend KM training programmes for library staff is very important. In addition, attending seminars, workshops, formal short courses and long courses are also very important for the application of KM awareness practices in academic libraries.

Further, the application of KM practices needs a mix of technical, organisational and interpersonal skills. Thus, library staff needs to be conversant with the types of KM practices to better serve the library users from all angles. The changing role of academic librarians from information managers to knowledge managers emphasises the need for library staff to constantly update and/ or acquire new skills to remain relevant to today’s information changing the environment. Consequently, library staff needs to reposition

themselves as knowledge managers by enhancing their information management skills and KM competencies.

### **7.2.3 Conclusion of the benefits of KM practices in academic libraries**

Benefits of KM practices in academic libraries are well acknowledged worldwide (Kumar, Agarwal, and Islam 2014; Jain 2007; Jain 2013; Maponya 2004; Mavodza 2010). Despite the benefits and uses of KM practices in the academic libraries, the application of KM practices in most of the academic libraries is very slow and unplanned (Jain 2007; Mavodza 2010; Townley 2001). Therefore, there is a need to start applying KM practices to improve the quality of the library services. KM practices include various activities such as knowledge creation, manipulation, storage, sharing, transfer, acquisition and codification; however, only knowledge creation and sharing practices were employed in this study. This is due to the fact that new knowledge is created daily in academic institutions through teaching, learning, research and innovation; and then shared among academic environment. The phenomenon of sharing knowledge is very difficult due to the fact that most of the knowledge is tacit thus; it is the mandate of the owner to contribute their knowledge to be shared. Thus, knowledge sharing culture needs to be integrated into academic institutions, as well as, knowledge creators or knowledge owners need to be motivated to share their knowledge for the benefit of the entire community. Knowledge creation and sharing should be considered as a continuous process within the academic environment.

Academic libraries must be regarded as a permanent place for the application of KM practices in higher learning institutions. This is due to the fact that libraries store both tacit and explicit knowledge, and can provide mechanisms through which tacit knowledge can be codified to make it available to the entire community. Academic libraries are among the organs in higher learning institutions where knowledge creation is a priority. Therefore, the benefits and uses of KM practices in academic libraries are very invaluable and therefore, academic libraries worldwide need to implement KM practices for the benefit of the entire university community and the community utilising the academic libraries.

KM practices must be incorporated and implemented to improve academic libraries' services and operations. Academic libraries need to manage the knowledge produced from within and outside their academic libraries and, therefore, to facilitate the retrieval, access and use of such knowledge. Currently, academic libraries worldwide are undergoing a period of profound change with changes in the format of information accessed and provided, changes in the needs of library users and organisations in general, and the changes in the roles of both academic libraries and librarians. This has necessitated the needs for academic libraries to become providers of information and periodicals, knowledge seekers as well, that

are seeking knowledge both from their library users as well as in-house knowledge from employees within the library and academic institutions.

Therefore, since academic libraries are constituents of the parent university, they should rethink and explore ways to apply and integrate KM practices to improve their services and also restructure their functions to expand their roles and responsibilities so as to effectively contribute and meet the needs of a large and diverse university community. In addition, library staff needs to adopt new ways of searching information/knowledge to facilitate easy access, retrieval, and use of such information. For example, most of the academic libraries nowadays have significantly transformed from Machine Readable Catalogue (MARC) and circulation desks to metadata, from interlibrary loans to online databases, from bibliographic instruction to information literacy, and from IM to KM.

#### **7.2.4 Conclusion on the KM enablers for the application of KM practices**

There is a need to employ various KM enablers for the application of KM practices in academic libraries. KM enablers such as KM training, ICT infrastructure, organisational culture, incentives/rewards, management support, trust, and competencies and skills are needed to enhance the application of KM practices and to facilitate knowledge sharing practices in higher learning institutions. KM training can be regarded among the critical KM enablers. KM training could help library staff to obtain the needed skills and knowledge on how to implement KM practices in their libraries.

Besides KM training, library staff needs to attend in seminars, workshops and programmes which offer KM applications in academic libraries. On the other hand, lack of motivation was raised as among the major challenges because library staff needs to be motivated to participate in KM practices especially in knowledge sharing practices. Motivation can range from monetary rewards or non-monetary rewards. Thus, this study has concluded that academic libraries need to equip various KM enablers to facilitate the application of KM practices.

The understanding of the effectiveness of KM enablers for the application of KM practices needs comprehensive and integrated views by considering various aspects which include both social and technological aspects. Since, people are the sources of knowledge production, the application of KM practices should include digitization of library learning materials, establishment of KR for knowledge storage, setting up of KMS for the management of organisational knowledge and a mixture of various factors that minimise the difficulties of implementing KM practices for the benefit of the entire



community. KM practices require changes in organisational setup and members' behaviour. Thus; the only solution is to ensure the existence of KM enablers within organisations.

### **7.2.5 Conclusion on knowledge creation and sharing practices through SECI processes**

Despite normal duties conducted daily in the majority of academic librarians, such libraries need to become more active in the creation and sharing of knowledge creation and sharing. Therefore, they should strive to turn into real humanistic knowledge societies where constant learning is possible for every library staff. Therefore, knowledge creation and sharing practices need to be enhanced to facilitate daily activities conducted within academic libraries on a daily basis. SECI processes were seen as a mechanism or tool which used to explain knowledge creation and sharing practices in academic libraries.

On the other hand, Knowledge Creation (SECI) Model was employed to obtain a higher degree of individuals' perception toward knowledge creation and sharing activities in academic libraries. All the four SECI processes provide a number of activities which conducted in academic libraries to ensure knowledge creation and sharing practices among library staff. The knowledge creation and sharing activities start with socialisation process whereas tacit knowledge of individuals is acquired; then externalised through dialogue into explicit knowledge to be shared within the library. Knowledge creation and sharing practices within an organisation are predominately created and then shared in through the process of interaction among people. Further, SECI Model has been internationally accepted regardless of the cultural background and/or institutional limits of its applicability.

### **7.2.6 Conclusion on the access and use of Web 2.0 tools in academic libraries**

The access and use of Web 2.0 tools in academic libraries were accepted as the natural and self-evident shift from traditional library services to online and/or hybrid library services. Therefore, library staff within academic libraries needs to acquire the skills and knowledge necessary to ensure proficiency in an environment that constantly faced with new technologies while performing their duties. The access and use of Web 2.0 tools in this study would be easily institutionalised since they exist on the individual use of these tools. Individual respondents were first required to explain the access and use of Web 2.0 and if they had personal accounts in various Web 2.0 tools.

Despite the fact that, the access and use of Web 2.0 tools were slow and unplanned in the most of the academic libraries, the majority of the respondents were aware of the tools and they had Web 2.0 tools accounts in different Web 2.0 tools such as Facebook, WhatsApp, Wikis, Blogs, LinkedIn and Twitter. On the other hand, the majority of the library staff reported to access and use Web 2.0 tools for their

personal issues and not for work related purposes. In regard to this study, the access and use of such tools have been believed to help library staff enhance KM practices and perform their daily activities subsequently promoting and extending information services to the library users.

Some of the respondents still believe that Web 2.0 tools are used for social activities and not meant for academic purposes. Only a few of the libraries were reported having Web 2.0 tools in their libraries and the majority of Web 2.0 tools in such libraries are Facebook, Twitter, RSS Feeds, Social bookmarking and Blogs. The use of SNS such as Facebook and Twitter was relatively high, followed by Blogs and RSS. Social bookmarking and tagging sites were the least used tools. Academic libraries need to connect with their library users by adopting and integrating various Web 2.0 tools for innovative service delivery and information services. However, it remains important for academic libraries to be clear about what they intend to project to their user communities before they put any Web 2.0 tools into use.

There were various uses of Web 2.0 tools for innovative service delivery in academic libraries. The Association of College and Research Libraries (ACRL): a division of the American Library Association (ALA) research committee highlighted that the Web 2.0 tools and technologies offer new opportunities for the design and delivery of library resources and services, but also make more demands on the library staff and system (Tedd 2008). Therefore, for academic libraries to keep pace in this age of science and technology, they needed to apply different types of Web 2.0 tools.

Globally, academic libraries are actively involved in the application and use of various Web 2.0 systems as a means of promoting and extending library and information services to library users (Si, Shi, and Chen 2011). In this respect, this study concludes that library staff needs to understand how Web 2.0 systems work and the uses of Web 2.0 tools for innovative service delivery in academic libraries. Among the important functionalities of using Web 2.0 tools in academic libraries include: sharing library news and announcements, enhancing collaboration and participation, fostering communication, marketing library services and resources, providing information literacy tutorials, and facilitating reference services. A good example is the UP Library which facilitates the creation, sharing knowledge and communicating with patrons through the application of the various Web 2.0 tools.

In this 21<sup>st</sup> century, academic libraries are supposed to go to where library users are and these can be facilitated by the access and use of Web 2.0 tools. The modern information world depends upon technological innovations and applications to provide, promote, and support information services to the patrons. Thus, librarians and other employees within academic libraries have, to be honest and sincere

efforts to adopt and implement Web 2.0 tools for the benefit of their library users and the entire academic environment. In addition, academic libraries should match the modern information requirements with technological needs and demands of the patrons. Lastly, the study findings have concluded that academic librarians need to discuss with their library users on which Web 2.0 tools they think are easy to access and use to enhance their learning activities. As it is known, the application of Web 2.0 tools depends on users who decide what to use and what not to use in the light of Web 2.0 tools.

Web 2.0 tools application within academic libraries encourages patrons to be an integral part of the virtual community by sharing their ideas, thoughts, feelings, and other contents. They allow patrons to contribute to the maintenance of catalogues, review resources, locate and share relevant information with other patrons and society (Farkas 2007). Now, patrons have become both consumers of and contributors to libraries services (Stephens 2006). Therefore, Munatsi (2010:255) adds that “African academic and research libraries should urge user involvement and feedback in the development and maintaining of library services”.

Most of the visited academic libraries had a website as a gateway to various services offered in such libraries. These websites should be used to link Web 2.0 tools for various functions in such libraries. However, despite the availability of such websites, most of them were out of date and some of them contained information which did not represent the activities conducted in such libraries. The low level of using such websites/webpage among respondents’ was indicative of the fact that these websites were not well created and designed and that the information available on such websites was not motivating. Academic libraries need to have websites to ensure the access and use of Web 2.0 tools. However, Web 2.0 in academic libraries gained much promising achievement, but there was still a long journey to go to popularise the Web 2.0 theory and use in the libraries.

### **7.2.7 Conclusion on the application of Web 2.0 tools to enhance KM practices**

In the information environment, the paradigm shift or transition from the industrial age to the knowledge age has brought with it new technological innovations. This development affects academic libraries because of their perceived role in creation, management, diffusion and utilisation of information and knowledge. Information and knowledge are the primary assets in all aspects of academic libraries. Thus, academic libraries’ needs and success in their parent organisations depend upon timely and relevant access to information, knowledge, and communication services (Makori 2012). The study findings have revealed that only a quarter of the investigated academic libraries applied Web 2.0 tools to enhance KM practices in the academic environments.

The application of Web 2.0 tools to enhance KM practices is still seen as a new concept that may influence people to collect new ideas and measure their acceptance as part of the contribution of the knowledge economy. This study, therefore, confirmed that Web 2.0 tools build a platform on which users can create and share knowledge, express thoughts and reconfigure existing explicit knowledge. It was also suggested that by adding an intelligent searching function enables agents and customers to identify needed content wherever it is stored which includes real-time data retrieval from back-office systems (Shang et al. 2011:178-179). Hence, in addition to individual knowledge generation, a Web 2.0 platform emerges as a viable channel of knowledge building for general and specific discipline in the academic communities.

Web 2.0 tools and KM practices are viewed as complementary concepts because of the shift from the traditional ways people used to access, produce, and share knowledge; therefore utilisation of Web 2.0 tools in helping to enhance knowledge creation and sharing helps the academic environment considerably to learn and understand better the concepts, and spread the word to friends and colleagues, as to how to manipulate knowledge. Based on the Web 2.0 categories used to enhance KM practices in academic libraries, the present study concluded that there is a need to select Web 2.0 tools' categories which fit the academic environment and which could easily be implemented to facilitate application of KM practices. Not all Web 2.0 tools are meant to enhance KM practices. A clear investigation and evaluation of the Web 2.0 tools to enhance KM practices are highly recommended.

Knowledge creation and sharing practices could also be facilitated through the collaboration of SECI processes and Web 2.0 platform. Shang et al. (2011) add that although people can go to the whole SECI processes, various Web 2.0 tools have been developed to provide ways to explain and support different stages of knowledge creation and sharing practices as explained under SECI processes. For example, writing and sharing knowledge (socialisation process) could be facilitated by the use of Skype and Blogs; whereas learning by doing through content editor and co-development (internalisation process) could be enhanced through Wikis and Blogs. Agarwal and Islam (2014) suggest that along with an integrated library system or a library automation system, libraries will need to supplement and include other technology tools that can capture their knowledge needs adequately. Therefore, academic libraries should rethink of creating and sharing knowledge through the combination of both SECI and Web 2.0 tools. Such an understanding will help academic libraries to decide, plan and make investments in the appropriate Web 2.0 tools according to their need for their KM practices.

### **7.2.8 Conclusion on the factors that affect the application of Web 2.0 tools to enhance KM practices**

The KMS Success Model is a generally accepted model for effective application of Web 2.0 tools to enhance KM practices in academic libraries. Jennex and Olfman KM success model was adapted and modified to fit this study. The validated model was then renamed KMS Success Model. In this study, Web 2.0 tools (such as Facebook, Twitter, Blogs and Tagging) were regarded as KMS used to enhance KM practices.

Generally, KMS incorporate various technologies (e.g., KR, data warehouses, intranets, search engines, data filters, collaboration tools, intelligent agents) to facilitate the creation, storage, transfer, and sharing of knowledge both within and outside the firm's boundaries (Alavi and Leidner 2011). Alavi and Leidner (1999) add that there is evidence that use of such KMS tools leads to the enhanced communications and increased levels of participation among staff members, efficiencies in problem-solving and time-to-market, improved financial performance, better marketing practices, and improved project team performance.

KMS Success Model then hoped to be considered as a valuable contribution in the field of libraries and librarianship especially in academic libraries in Tanzania. This model will then being presented to the Ministry of Education, Science and Technology, and Vocational Training in Tanzania for further explanation and verification. And if approved, the KMS Success Model could be used as a guide for the implementation and application of Web 2.0 tools to facilitate KM practices in academic libraries. The proposed KMS Success Model could also be used in the different socio-cultural environment and at the different organisational context to make it a robust model. Lastly, Web 2.0 tools which were regarded as KMS in this study, hoped to provide seamless services to library users through media-rich systems such as Blog, Wikis and Social Network.

### **7.2.9 Conclusion on the challenges that hinder the application of Web 2.0 tools to enhance KM practices**

Challenges that hinder the application of Web 2.0 tools to enhance KM practices were divided into three groups: individual, institutional and technological challenges. Individual challenges include lack of awareness, lack of knowledge and skills, lack of motivation and lack of time and ignorance. Individual challenges might also include lack of awareness of the values of the usage of Web 2.0 tools in academic activities, inability to master technology "same old excuse" and ignorance. Therefore, librarians need to make much effort to learn what Web 2.0 tools are and how they could be applied to enhance KM

practices. Besides the facts that majority of respondents reported being familiar with Web 2.0 tools and reported to have account(s) on various Web 2.0 tools; the access and use of Web 2.0 tools in academic libraries are still slow and unplanned. Lack of time and ignorance were among the challenges which hinder the application of Web 2.0 tools to enhance KM practices in academic libraries. Thus, academic libraries need to provide enough time for their staff to participate in KM application.

Librarians need to be aware of individual challenges which were not mentioned and take precautions on how to overcome them. Some of such challenges included wrong beliefs, wrong perceptions, technophobia, expectations, attitudes, feelings and unwillingness to use Web 2.0 tools to enhance KM practices in academic libraries. Paroutis and Al Saleh (2009:56) add that the effectiveness and hardness of using Web 2.0 tools could negatively affect the willingness to adopt the tools. In addition, Hislop (2013:186) asserts that individual challenges might include lack of fairness, friendship, lack of trust and openness prohibiting the utilisation of Web 2.0 tools to enhance KM practices.

Sohail and Daud (2009:131) explain that institutional challenges are challenges that can be environmental and may be caused by individuals who occupy the managerial position within the institution. Institutional challenges which ranged from lack of KM policy, lack of infrastructure and resources and lack of management support and good leadership reported hindering the application of Web 2.0 tools to enhance KM practices in academic libraries. Management supports such as financial support, IT infrastructure, organisation structure, motivation to staff, and library resources need to be provided to facilitate the application of Web 2.0 tools to enhance KM practices in academic libraries. Other institutional challenges such as lack of internet connection and lack of security and privacy need to be minimised to encourage more people to use Web 2.0 tools. Academic libraries need to have websites linked to various Web 2.0 tools to enhance the access and usage of such Web 2.0 tools. In addition, such Websites will be used as a gateway to various information and they could provide a link to various Web 2.0 tools.

Lack of the Internet connectivity and electricity are among the critical challenges facing academic institutions in developing countries. Thus, academic institutions need to make sure unnecessary things which hinder internet connectivity must be monitored and prohibited. For example, activities like downloading and watching movies and chatting must be prohibited. This could be handled by proper security towards Web 2.0 tools integration into higher learning institutions and academic libraries.

Technological challenges are associated with the lack of skills and techniques in utilising Web 2.0 tools to enhance KM practices in academic libraries also need to be managed. Grosseck (2009:480) as well as

Paroutis and Al Saleh (2009:56) add that there are various technological challenges that hinder the application of Web 2.0 tools to facilitate KM practices such as unwillingness to use the tools, unrealistic expectations of IS/IT systems, and difficulties in building, integrating and modifying technology-based systems hindering the utilisation of Web 2.0 tools to enhance KM practices.

Lack of the knowledge and skill about the implementation of various Web 2.0 tools, their benefits, unawareness or cynicism about their value to the academic institutions, and perceptions of certain risks and downsides are also associated with the low usage of Web 2.0 tools (Paroutis and Al Saleh 2009:53). In addition, lack of technological skills such as integrating Web 2.0 tools, uploading Web 2.0 tools, linking Web 2.0 tools to the library websites/webpage, maintenance and repair of devices used to facilitate the application of Web 2.0 tools are among the technological challenges that hinder the application of Web 2.0 tools in academic institutions (Hosseini and Hashempour 2012:139; Muneja and Abungu 2012:18). In this age of Science and technology, academic libraries need to employ skilled and experienced personnel to facilitate the application of Web 2.0 tools to enhance KM practices.

### **7.3 Recommendations**

Since knowledge is a collection of expertise from everyone in the academic environment, there is a need to ensure the effective application of KM practices as well as the access and use of Web 2.0 tools to ensure the application of KM practices in academic libraries. Studies by Islam, Agarwal, and Ikeda (2014), as well as, by Jain (2007) recommend on the application of KM practices to improve academic library services. The recommendations address each of the research objectives as presented in this study.

#### **7.3.1 Recommendation on the background of the respondents**

Gender needs to be involved in addressing research problems especially on the use and access of Web 2.0 tools and on the application of KM practices. This explains the involvement of gender on the application of Web 2.0 tools to enhance KM practices. In this study, more male respondents participated in the study than female respondents. Apart from gender, other respondents, background such as age, education level and specialisation are also considered on the application of Web 2.0 and KM practices.

#### **7.3.2 Recommendation on the KM awareness among respondents**

Levels of KM awareness among library staff must be identified and evaluated to ensure the effective application of KM practices. Further, academic libraries and their parent organisations need to promote and market KM awareness amongst library users (student community, teaching faculties and all the other stakeholders) to understand their participation and contribution to KM practices in the academic

environment. Therefore, academic libraries and their parent organisations should carry regular exercise to determine KM areas which need KM intervention to enable library staff to apply KM practices in their libraries.

The country needs to establish enough library schools to train more librarians. The available library schools in the country need to ensure that relevant KM concepts are integrated into their curriculum to make sure that library staff receives the KM training. Ocholla and Bothma (2007) suggest that “It is evident that LIS in schools has, to a greater or lesser extent, been redesigning their curricula to keep track of the latest developments in the information world and keep their teaching market-related”.

Further library staff should be encouraged, permitted and supported to attend various KM training, conferences and workshops conducted within and outside the country to equip them with more KM skills and also to network with KM experts. For example, IFLA world conference has a KM section known as IFLA KM section whereby library staff can participate by learning to network with various KM experts.

### **7.3.3 Recommendation on benefits of KM practices in academic libraries.**

Academic libraries need to facilitate the process of converting information to knowledge by providing access to adequate information resources, as well as, by creating an environment which will permit face to face forums and network formation so as to discuss and debate issues of concern to the population. In this case, the role of library staff becomes that of infomediaries managing the process of turning information into knowledge for action.

Academic libraries need to train trainers in information centres who can train communities and organisations in the creation and sharing of knowledge for development so as to build collective intelligence. Therefore, the older concepts of information literacy and information retrieval now needs to be revisited so as to include KM literacy as a way of keeping up with the knowledge revolution (Mchombu 2006).

Knowledge identification is in line with the establishment of knowledge needs of their parent organisations which will be defined by all the activities conducted and services offered. In addition, to simplify the identification of knowledge needs exercise, academic libraries need to conduct a knowledge mapping on regular basis. Knowledge mapping is used to establish and identify the knowledge needs in the organisation and to ensure the flow of the knowledge, the sources of knowledge and the accessibility of those sources to the library users.



Academic libraries need to capture tacit knowledge existing amongst staff within the academic environment and then codify it and preserve it for future use. This will help to retain the knowledge situated in individual workers who might die or leave the institution. In this case, academic libraries are required to establish knowledge retention policy which will guide to capture and retain individual workers' knowledge working in academic libraries. In addition, academic libraries need to develop means of capturing all tacit knowledge that is useful to their users, organisations, and internal operation. Maponya (2004) argues that "much knowledge is stored in the heads of the people and it is often listed if not captured elsewhere. Therefore, the surest way is to avoid loss of organisational memory is to identify the expertise and the skills of staff and capture it" Pearlson and Saunders (2009) present three major steps which are scanning, organising and designing knowledge maps.

**Scanning:** This is a mechanism which is used to combine electronic and human approaches to capture knowledge after the identification of strategic knowledge. Traditionally, electronic scanning captured relevant knowledge from a particular source (provided the information is available electronically), then filtered out redundant or duplicative information. Human analysts then added the most value to the scanning process by using their own knowledge of what is important to the company to provide context, interpretation, comparison and condensation (Pearlson and Saunders 2009:360). The emergence of Web 2.0 tools facilitate this type of scanning; for example, RSS feeds make it possible to automatically scan relevant Web sites and filter the way it is displayed. However, with Web 2.0 sites that aggregate information from various sources, many individuals are able just to see the topics of interest.

**Organising:** This process attempts to take the knowledge mass accumulated through scanning and structure it into an accessible form. Some structure is necessary to permit rapid access; however, too much structure can effectively hide knowledge from employees whose mental models do not fit those of the organisers. This could be handled by the use of tagging in which keywords for tagging are generated by content users. The problem of this classification is that everyone has different perceptions of the content. Thus, user tags can be imprecise, irrelevant and often messy. Further, Folksonomies are ill-organised because they contain many unlinked variants such as plural, singular spelling errors and typos. Ruggles (1997) presents a scheme for categorising knowledge uses into four broad classifications as follows:

- (a) **Process knowledge:** sometimes referred to as "best practices" this kind of knowledge is useful for increasing efficiency;

- (b) **Factual knowledge:** Basic information about people and things that have been synthesised and placed in the context; easy to document;
- (c) **Catalogue knowledge:** individuals who possess catalogue knowledge know where things are. These people are like directors of expertise and while such knowledge can often be codified into a sort of Yellow Pages, the dynamics within organisations change so quickly, some individuals will always be more valuable because they know where to go for the right knowledge; and
- (d) **Cultural knowledge:** knowing how things actually get done in an organisation both culturally and politically. The absence of cultural knowledge can reduce more efficiency when employees must learn or relearn invisible norms and behaviours.

Codification process which helps to put the knowledge in a form that makes it possible to find and use must be conducted effectively. Hislop (2013:207) also recommends that knowledge needs to be codified; and once codified it can be transferred and shared between people via ICTs. Knowledge is codified into documents like standard operating procedures, troubleshooting checklists, and protocols for decision making. The assumption is that once what is regarded as the ‘best practice’ way of completing a task has been identified, this knowledge can be codified and disseminated to all relevant staff who may need to use it (Hislop 2013:207). Further, Davenport and Prusak (1998) identify four basic principles of knowledge codification which are as follows:-

- (a) Decide what business goals the codified knowledge will serve (define strategic intent);
- (b) Identify existing knowledge necessary to achieve strategic intent;
- (c) Evaluate existing knowledge for usefulness and the ability to be codified; and
- (d) Determine the appropriate medium for codification and distribution.

Knowledge gap exercise is very important to ensure the application of KM practices in the academic libraries. Jain (2007) asserts that the identification of knowledge gaps is a very critical factor for KM practice; this is because knowledge gap could help an institution to identify and establish knowledge needs in various knowledge areas thus enabling users to meet their knowledge needs at the right time, place and format. In addition to this, Wiig (1993) recommends that knowledge gaps exercises are conducted to establish knowledge assets in an organisation.

Academic libraries are also required to establish knowledge resource management to ensure proper application of KM practices in the academic libraries. Due to the exponential growth in human knowledge in a variety of formats, there is a need for library staff to develop their resource access and

sharing strategies from printed to electronic and digital resources. Further academic libraries need to make sure that the library resources are well maintained and organised to allow easy access, retrieved and use of library resources. Academic libraries should also employ and use integrated OPACs to store and maintain both internal and external resources as well as printed and other formats of knowledge.

Academic libraries need to create KR to enhance the access, retrieve and use of knowledge. KR is often called data warehouses or data malls; and frequently, they resemble libraries or archives in some respects (Townley 2001). Townley (2001) explains that knowledge can be collected and organised in some symbolic form, such as a catalogue or a bibliography. Authorised users will be allowed to access the knowledge at any time. However, some of the libraries reported having IR. Therefore, this study has recommended the establishment of KR.

Academic libraries need to employ and/or appoint Chief Knowledge Officer (CKO) to ensure proper application of KM practices in academic libraries. The Chief Information Officer (CIO) was a conspicuously high management position that emerged successively in the government departments and large organisations in the Western countries since the 1980s. However, the position is now occupied by the CKO in most of the organisations. CKO is the highest-ranked person in charge of knowledge management, which has evolved from CIO along with the transition of information research management into KM. The appointment of CKO in academic libraries will ensure all the KM practices are under the control of one person who will be able to ensure all the KM activities are in place. Rui (1999) also recommends that the CKO system represents the latest development trends of the IM system of the organisations, and marks the transition of IM from the stage of information resources management to that of KM.

Academic libraries need to establish KM portals to facilitate the creation of knowledge among library staff. The KM portals can be developed by using any internet hosting solutions whereby the access can be restricted by login systems. Users with different levels of permission will also access, retrieve and use information. KM portals are database developed to keep the records of authors, members, access levels, visitor tracking and many other requirements. Usually, all contribution of these members passes through a veteran approval system first then it goes to the public view or the user view. Members posting to the author, rating system, feedback of users/members management, admin areas, and the like are some of the features of KM portals.

Academic libraries need to facilitate the identification and establishment of communities of knowledge within academic institutions. Communities of knowledge help groups of people who are willing to work together to create and share knowledge to come together. Snowden (1998) adds that most important aspect of the creation of communities of knowledge is the generation of peer group networks which will be used to spread the flow of expertise and other tacit knowledge. Communities of knowledge members of each group need to formulate and sign the memorandum of understanding on how each member will participate in KM practices. In addition, each group must select a leader who will take the control of all the activities conducted within a group. For example, leaders within each group can nurture the creation of knowledge by providing enough time and incentives for people who will contribute to knowledge creation and sharing practices. Borzillo, Azner, and Schimitt (2011), as well as Hislop (2013), suggest the following ideas in the formulation of communities of knowledge:-

- (a) Emphasise practice-based, peer-supported learning methods rather than formalised, classroom-based methods as this reinforces the existing ways that communities learn and share knowledge;
- (b) Have specific people within a community undertaking organising roles which have the objective of sustaining and developing the community;
- (c) Due to the significant length of time required for communities of knowledge to develop (to allow the creation of common perspective, and a stock of common knowledge as well as a sense of collective identity) continuity is important. Overly discontinuous social relations are thus unlikely to hamper their development; and
- (d) Find, nurture and support existing communities.

Academic libraries need to join various KM associations and organisation to ensure the application of KM practices. For example, academic libraries should join and participate in Knowledge Management Africa (KMA) to build a network with other institutions and people who are doing KM activities in Africa. KMA is one among the electronic networks which have been created to foster connections across varying boundaries to create a knowledge bank that links expertise with demand. Banhenyi (2007) adds that the mission of KMA is to promote the use of Africa's collective knowledge as a key development resource and establish KM platforms that will create access to existing networks and facilitate the sharing and utilisation of knowledge across all sectors.

Academic libraries need to obtain information about their users in general, as well as, their information needs. Such information could be obtained by analysing the records of users' registration, surveys, circulation and inter-library loans, frequently asked the reference question and the use of e-journals and

digital resources. On the other side, library users have to provide with necessary information and manuals which can guide them in getting all the services that are provided in the library. Examples of such library manuals information include new publication alert, CAS and SDI which libraries have been providing. Therefore, academic libraries in Tanzania and in other parts of Africa need to go an extra mile to ensure that all the necessary things which can help and guide library users to be comfortable in using and accessing library services are in place. In addition, academic libraries need to provide information and instruction to library users through a variety of reference and bibliographic services, such as course-related and course-integrated instruction, hands-on active learning, orientation and formal courses.

#### **7.3.4 Recommendation on KM enablers for the application of KM practices**

Academic libraries should implement KM enablers to facilitate the application of KM practices as well as to ensure the strong cooperation between library staff and the management for the application of Web 2.0 tools to enhance KM practices. There are various KM enablers for the application of KM practices in academic libraries such as organisational culture, IT infrastructure and skills. Despite the fact that there are several types of KM enablers to guide the application of KM practices, this study recommends that the academic libraries need to focus to those KM enablers which have the direct effect on both library staff and management. For example of such KM enablers is organisational culture. Ongwen (2012) adds that an organisational culture which emphasises cooperation, sharing and innovation will be the product of strong leadership and commitment from library directors and a shared vision by library staff.

Academic libraries in Tanzania and other parties of Africa must ensure the implementation of KM policy and guidelines to guide the application of KM practice. Much effort must be invested to ensure proper application and integration of KM policy. Mchombu (2006) adds that libraries in Africa must lobby to influence KM policy making. Library and information associations need to be organised to influence KM policy and voice their opinions when policy issues related to KM practices are tabled in their country or international forums. Academic libraries must also use partnerships or strategic alliances to acquire KM policies or programs intended to improve worker retention.

Academic libraries should guarantee that KM training and supports are provided to library staff as well as library users to ensure the application of KM practices in such libraries. Townley (2001) supports that training and support for the adoption of new knowledge and behaviours are perhaps the most important and costly part of any KM application. Commitment, training, and support are key factors for the effective application of KM practices; thus, if library staff are not committed archiving library goals, or if

they are not well trained in the use of organisational knowledge, it is likely that efforts to manage knowledge will fail (Townley 2001).

Academic libraries should encourage experienced library staff to transfer their knowledge to new or less experienced library staff and provide informal training related to KM practices. Again, academic libraries need to encourage library staff to continue their education by reimbursing tuition fees for successfully completed work-related courses and offer off-site training to library staff to keep KM skills current. Moreover, academic staff needs to provide formal training related to KM practices and uses formal mentoring practices, including apprenticeships.

In addition, academic libraries should introduce and/conduct vocational training and lifelong education for their library staff to raise their knowledge level and the ability to acquire and innovating knowledge (Rah, Gul, and Wani 2010:27). Kabede (2010:422) emphasises that the primary training thrust of IS should emphasise KM at different levels. This should include expanding degree programs (BSc, PGD, MSc, Mphil, and PhD) at higher learning institutions, including KM courses in other areas of specialisations within IS as compulsory and conduct short courses as professional development intervention.

Academic libraries need to implement and adopt new roles for library staff for the proper application of KM practices. The emergence of 21<sup>st</sup> Century brings with it new rules and requirements for different competencies and skills for library professionals which are beyond those traditionally practiced and understood; thus library employees are therefore required to be equipped as, or capable of performing or adapting to, the following new rules as proposed by Chase (1998), Hislop (2013), and Jain (2009):-

- (a) Technology experts both in using and training technology;
- (b) Knowledge mappers/engineers: representing or mapping tacit and explicit knowledge to enable its classification, dissemination and identifying the gaps in the knowledge;
- (c) Knowledge gatekeepers: acting as subject experts and familiar with evolving vocabulary (taxonomies, metadata, metatags and filtering etc.);
- (d) Knowledge editors to repackage knowledge into the most accessible, appropriate formats.
- (e) Networkers and knowledge brokers, with good networks of contacts within and outside the organisation;
- (f) Web designers to display and share knowledge in eye-catching ways;

- (g) Programmers who could customise their instructions and services according to their customers' needs;
- (h) Knowledge and information disseminators rather than custodians of information;
- (i) Researchers both for personal and professional development and for providing up to date assistance to patrons;
- (j) Knowledge consultants to provide expert advice beyond the usual operational zone;
- (k) World knowledge content experts who stay updated with international news in their specialised areas;
- (l) Metadata specialists able to describe and dictate management and preservation strategies for digital information; and
- (m) Knowledge asset managers to identify, evaluate, advice, and manage a portfolio of knowledge assets, such as patents, trademarks, copyrights, etc.

Lastly, academic libraries need to motivate and reward their staff who will participate in the KM practices. This will help such staff to build trust and morale of doing KM activities for the benefit of their institutions. Townley (2001) also recommends that library staff needs to be encouraged and rewarded constantly for applying useful knowledge for the achievement of organisational goals. In addition, academic libraries should also utilise both monetary and non-monetary incentives to motivate library staff to participate in KM practices.

### **7.3.5 Recommendation on knowledge creation and sharing practices**

Academic libraries should consider the application of Web 2.0 Driven SECI Model (the combination of SECI processes and Web 2.0 tools) to explain how various activities are conducted to enhance knowledge creation and sharing practices in academic libraries. In addition to Web 2.0 Drive SECI Model, Shang et al. (2011) also presented a model which shows how knowledge can be created through the link between SECI processes and Web 2.0 tools. Figure 7:3.1 shows knowledge creating a cycle in Web 2.0 sites.

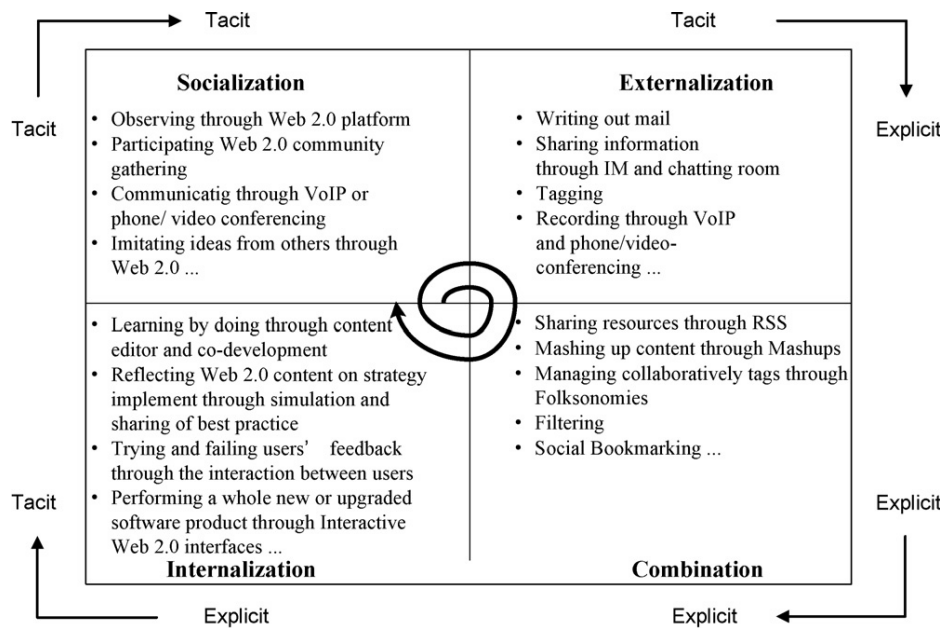


Figure 7.3:1 Knowledge creating a cycle in Web 2.0 sites

Knowledge creation and knowledge sharing practices need to be vertical as well as horizontal (executive and non-executive) in organisational leadership. Academic libraries should seek best ways to capture both tacit and explicit knowledge for such knowledge to be shared and used for the benefit of the entire academic community.

Library staff, therefore, needs to be proactive to ensure knowledge creation and sharing practices are well conducted for the benefit of their libraries and their parent institutions. In addition, library staff needs to establish networks among themselves and among library users to ensure both library staff and library users are participating in knowledge creation and sharing practices in academic institutions. Townley (2001) also adds that academic libraries need to create a network of subject specialists, perhaps from several institutions who come together to share experiences and learn from each other.

Academic libraries could also create yellow pages, classifying individuals by different areas of expertise into a logical whole. Internal and cross-training and exchange with other organisations are also important for knowledge creation practices. Library staff should also ensure knowledge creation and sharing practices by regularly updating databases of good work practices, lessons learned or listings of experts and collaborative work by project teams.

Academic libraries should allocate annual funds to provide continuing education and staff training to all staff members to participate in knowledge creation and sharing practices. According to Lee (2005),



“Libraries should also encourage the transfer of knowledge and experiences from experienced staff to new staff members”. Mentoring systems should be in place to help new library staff to learn from experienced library staff. Informal seminars and brown bag sessions where staff can interact and exchange “lessons learnt”, “best practices”, and other specific experience and knowledge should be scheduled at regular intervals and at the convenient time.

### **7.3.6 Recommendation on the access and use of Web 2.0 tools in academic libraries**

The employment of Web 2.0 tools in academic libraries and also their access and use of Web 2.0 tools are for innovative service delivery. Further, the access and use of Web 2.0 tools in academic libraries should address major changes in management exercise and provide technological solutions to the existing problems.

Academic libraries in Tanzania should apply and join various Web 2.0 tool projects, to enhance the access and use of Web 2.0 tools for innovative service delivery. There are various Web 2.0 tool projects conducted worldwide to assist and support libraries, especially in developing countries to implement Web 2.0 tools for innovative service delivery in their libraries. For example, LASSIE Project (2008) (Libraries and Social Software in Education) which was funded by the University of London Centre for Distance Learning explored new developments in Web technology commonly referred to as social software (or Web 2.0) and how this software might be used to enhance library provision for distance learners. The project concluded that Web 2.0 training which aimed to improve the quality of online training that libraries offer and the potential to enhance library services (LASSIE Project 2008). More information on the training progress can also be tracked via the project Blog, which is still available at <http://elearning.lse.ac.uk/blogs/socialsoftware/>. Training materials are still valid and they could be used to enhance the implementation of Web 2.0 tools in academic libraries. Academic libraries also need to create and update their websites to link various Web 2.0 tools and facilitate their application in enhancing KM practices. Library websites should serve as a portal for all sources of relevant knowledge and information of various types.

Academic libraries need to incorporate information technology security and authentication techniques which may permit libraries to practice single password logins. IT security is a process of protecting information systems from unauthorised access, use, disclosure, disruption or destruction; however security is not an IT problem but a business problem (Vacca 2010). Upon successful authentication, users can have access to a whole range of electronic resources and services without having to remember individual passwords - long the bane of resource connectivity and electronic services provision to

multiple resources. Likewise, new opportunities are available for using technology to promote services and resources (e.g. using push technology to disseminate information its potential users) and to evaluate the range and quality of services (e.g. through online surveys) (Foo, Majid, and Wani 2002). Therefore, security implementation and management motivation include:-

- (a) Security implementation and management to allow authorised user and limit unauthorised physical access to electronic information systems and the facilities within the library;
- (b) Identify individuals (library members, workforce members, management teams and so on) with the authorised access by title or qualifications;
- (c) Specify the methods that will be used to control physical access, such as door locks, electronic access control systems and security officers (Vacca 2010); and
- (d) Information assurance which can be achieved when both information and information systems are protected against attacks through the application of security services such as availability, authentication, confidentiality and no repudiation (Vacca 2010).

Training programmes based on the access and use of Web 2.0 tools must be organised and conducted regularly to equip library staff with knowledge and skills on how to access and use Web 2.0 tools for innovative service delivery in academic libraries and KM practices. Despite the fact that librarians are very conversant on using Web 2.0 tools for their personal issues, the present study findings revealed the lack of knowledge and skills in the access and use Web 2.0 tools for both innovative services delivery and KM practices.

Academic libraries need to identify training needs to help library staff recognises their needs and create the desire to learn and apply Web 2.0 tools. Adekunle, Omoba and Tella (2007) add that:-

Adequate training and knowledge of ICT are crucial in encouraging librarians to show a positive attitude toward it and training and knowledge are the sine qua non of a positive attitude toward ICT. In this era, when new technologies are introduced almost daily, it is essential for librarians to keep up with ICT developments. The fear of some in the developing world toward ICT is widening the digital divide.

In Africa, it is time to bridge the digital gap. Training is the first step, which will reduce fear when implementation of ICT begins.” In addition, Minishi-Majanja (2004) adds that “Sub-Saharan LIS schools do offer a wide variety of ICT modules within their curricula” and that “it was notable that most LIS

schools, particularly those based in Southern Africa, have a significant ICT content in their programs/ qualifications”. In addition, it is also necessary to train the library users when and how to access and use Web 2.0 tools available in the library.

In line with training activities, academic libraries need to conduct a series of seminars and workshops to introduce Web 2.0 and provide actual operation opportunities for library users to participate in access and use of Web 2.0 tools in academic libraries. After the adoption of Web 2.0 technologies, library staff must offer a series of user education which will help to improve library users’ knowledge about them and the skills of using Web 2.0 tools through all possible means.

The application of Web 2.0 tools to enhance KM practices within academic libraries needs to be guided by policies and guidelines. Tanzania lacks clear policies and guidelines used to guide the access and use of Web 2.0 tools in academic libraries as well as in other sectors in the country. Tanzania is still using the old ICTs policy guideline which was established in 2007 which lacks most of the important components such as the access and use of Web 2.0 tools and social media tools to the country (Materu-Behitsa and Diyamett 2010; Yonazi 2012). Moulaison and Corrado (2010) add that “Official social media policies for libraries can help libraries stop using social media experimentally and start using it in a way that is respectful of our users, our employees, and our mission as the potentially powerful tool that is it”.

Creation of Web 2.0 tools policy is very critical for the access and use of Web 2.0 tools in academic libraries. It is observed that whether your library is active on Web 2.0 tools use or not, your employees probably are; which was also indicated in this study findings. Therefore, it is probable that your clients may be “talking” about your (library) via various Web 2.0 tools (such as Facebook and Blogs). So would it not be better to consider having a Web 2.0 tools presence and hence, a policy outlining to employees, the corporate guidelines or principles of communicating in the online world (Penzhorn 2013). In addition, Penzhorn (2013) mentions the advantages of having Web 2.0 policy within higher learning institutions as follows:-

- (a) To control messaging this is due to fear that employees are going to start trash-talking the institution and hurt the institution culture and brand;
- (b) To let employees know what they need to know to communicate the institution message effectively, and what they should and should not do; and
- (c) Considering the public nature of Web 2.0 tools and the speed at which information can spread, without proper guidelines in place, your institution is exposed to risks – these risks range from an

employee posting employees social “networking” on Facebook on institution time to an employee posting offensive content that causes serious damage to their institutions’ reputation.

Further academic libraries should adapt and modify Moulaison and Corrado (2010) guideline for the establishment and implementation of social media and Web 2.0 tools policy in libraries which include the following guidelines:-

- (a) Determine your Objective:
  - What does it mean to your library to have a successful social media presence?;
  - Align social media presence with organisational mission and goals;
  - Define the role of new media and social media, tying them into the goals of the institution; and
  - Create, as necessary, a set of goals for the use of each social media site.
- (b) The approval process of social media/Web 2.0 tools uses (including who and why). Specify which employee(s) / team(s) will have new social media responsibilities;
- (c) Training - determine education needed to support new media use;
- (d) Evaluation of social media presence: evaluate the current use of social media/Web 2.0 tools in the library;
- (e) Legal concerns (include record retention, copyright, and privacy laws)- Include information about any applicable laws or regulations:
  - Intellectual property;
  - Copyright;
  - Privacy laws; and
  - Record retention laws.
- (f) Personal/individual use of Web 2.0 tools in the library:
  - From staff with personal accounts
  - If not addressed elsewhere may be appropriate to include the use of library time and resources for the individual use of Web 2.0 tools.
- (g) Branding, disclosure, and disclaimers:
  - Specify who may and under what circumstances.
- (h) Content (the type of content to post or not to post):
  - Identify services, collections, news, information, etc. that may be advertised/ marketed
- (i) Best practices (including knowing your audience):
  - Guidelines for interacting with the public (including moderating comments); and

- Politeness/tone/level of formality.
- (j) Professionalism and demeanour
  - Use of abbreviations or web conventions for spelling;
  - Personal disclosures including giving names, locations, etc.
  - Speed of responses to direct questions;
  - Importance in relation to other library services (less important than phone queries, but more important than email questions?); and
  - Instances where employees use their own judgment in responding to difficult or challenging posts, and the spirit informing that judgment.

Figure 7.3.2 indicates an example of social media/Web 2.0 tools policy created in one of the libraries.

**Pillsbury Free Library**  
 Serving Warner, NH since 1892  
[info@warner.lib.nh.us](mailto:info@warner.lib.nh.us)  
 603-456-2289

Mondays & Wednesdays: 1 - 5 pm  
 Tuesdays & Thursdays: 9 am -12 pm, 1 - 8 pm  
 Saturday: 9 am - 2 pm

Home | Online Resources | Books & More | Kids | Teens | Library Info | Warner Links | How Do I? |

**Quick links**  
 Warner Events Calendar  
 Search our catalog  
 NH Libraries catalog  
 Other Library Catalogs  
 Downloadable Books  
 Online Magazines & Indexes

**Social Media Policy**

In keeping with the Pillsbury Free Library's mission to "serve the public by providing the freedom and opportunity to access information, knowledge, and ideas from a wide variety of sources" the Library participates in various "social media" applications whereby library staff and community members can interact through virtual (Internet) communication. These resources, summarized below, allow access to the resources of the Pillsbury Free Library without mandating a visit to the physical library. The Pillsbury Free Library regards social media applications in the same way as its other information resources in accordance with its mission of serving Warner's needs for informational, educational, cultural and recreational pursuits.

Figure 7.3:2 Example of Social media policy in a library

Therefore, academic libraries should develop and implement policies and guidelines to empower library users to participate in the access and use of Web 2.0 tools. The established library policy towards the use of Web 2.0 in academic libraries should, therefore, encourage both library staff and library users to comment, re-tweet and share their ideas towards the improvement of the library.

Academic libraries also need to have policy and guidelines to guide their brand usage and comments towards Web 2.0 tools. Branding is used to communicate the uniqueness of the services offered in the eyes of the target customer groups, with the intention of increasing the quality of the services in the library. Moreover, since most libraries are operating under the parent organisation like universities or

colleges, it is also advisable that the library's parent organisation must also have a brand identity that is used to manage external perceptions and competitive position of the institution as a whole. Thus, the library must protect and promote their brand by continuously tracking what is being said about the library through Web 2.0 tools.

Academic librarians should be encouraged sharing their experiences, enthusiasm, and ideas with their users and commit to reserve the rights to respond to their comments in promoting and marketing the library. Academic libraries need to ensure the reliability of internet connectivity to enhance utilisation of Web 2.0 tools. The government of Tanzania under the Tanzania Communication Regulatory Authority (TCRA) needs to consider providing broader Internet bandwidth to academic libraries to support the application of Web 2.0 tools to enhance KM application.

The government of Tanzania under its Ministry of Finance and Economic Affairs (MoFEA) should ensure sufficient funds to support the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania. Finance is the backbone for the proper application of Web 2.0 tools for innovative service delivery in academic libraries. Academic libraries need to factor in the cost of adopting any particular set of tools or technology, i.e. buying/licensing, and the cost of maintaining; however it is known that most of the ICT facilities are very costly and the majority of academic libraries cannot afford them. This is mainly because in developing countries the cost of technological and communication infrastructure far exceeds budgets allocated for library and information systems (Yu 2008; Madhusudhan 2010). Even though open source software is considered free, it is not really free, as libraries need to hire people (computer programmers or others) who can maintain the software, extend it, write short scripts and the like.

Academic libraries, therefore, need to decide between free versus paid tools; however, they need to understand that, the free or open source does not mean free. Further, academic libraries need to consider maintenance and training costs. After that, they would need to decide (based on budgets or human resources) whether they would go with proprietary (paid; supported other companies) or the free, open-source tools, where in-house manpower will have a greater role. Academic libraries need to commit to the security and privacy of their individual users and other employees during the use of Web 2.0 tools in the libraries.

Academic libraries need to ensure reliable power supply for the effective application of Web 2.0 tools so as to enhance KM practices in academic libraries. The problem of regular power cut-off affects most academic institutions in Tanzania where academic institutions and their libraries are highly affected. Thus, academic libraries need to think of other ways of minimising the problem by having standby

generators or other electricity sources in case of power cut-off. Muneja and Abungu (2012) support the idea that academic libraries need to ensure availability of reliable power by investing in generators, solar and other alternative sources. In addition, Lwoga (2014) reports that the government needs to provide standby power sources to enable academic institutions within the country to provide better services in case of the power cut.

Academic libraries need to use skilled and experienced personnel to work on the application of Web 2.0 tools to enhance KM practice. These expertises will guide the application of Web 2.0 tools as well as train library staff on how to deal with the application of Web 2.0 tools to enhance KM practices. Both KM and Web 2.0 tools are new concepts and there is very little expertise in such areas, therefore there is a need to employ and/or hire experts to ensure the application of both Web 2.0 tools and KM practices. Muneja and Abungu (2012) explain that there is need to have a well-developed human capacity at institutional levels to support Web 2.0 implementation and sustenance. In addition, Masha, Holmner, and Penzhorn (2015) suggest that skilled personnel are highly needed to ensure the application of Web 2.0 tools to ensure KM and KS in higher learning institutions.

### **7.3.7 Recommendation on the application of Web 2.0 tools to enhance KM practices in academic libraries**

Academic libraries need to enhance participation of users in the application of Web 2.0 tools to enhance KM practices in academic libraries. User participation is a key feature of Web 2.0 which is structured around open programming interface that allows any user to freely create, assemble, organise (tag), locate and share content (Boulos and Wheeler 2007). Web 2.0's participatory nature is best exemplified in Wikipedia where people work collaboratively to input, produce and update knowledge as opposed to the traditional encyclopaedias where the information is static and predetermined. The interactivity of Blogs compared to personal websites is another example of Web 2.0's participatory nature which stands in sharp contrast to the access control in applications commonly used in organisations.

Generally, Web 2.0 tools have the potential for KM practices. Web 2.0 tools are suitable for electronic research, knowledge creation, storage, sharing and usage. Web 2.0 tools provide a suitable platform for sharing innovations and electronic learning. The tools can reduce costs associated with the physical meeting as they enhance virtual collaborations. However, usage of Web 2.0 tools requires skills and internet connectivity. Thus, Web 2.0 tools facilitate networking, sharing information, commenting on published outputs and documenting and sharing experiences. Academic libraries should consider

recruiting staff with required technical expertise. The library should also offer training not only to library staff but also to library users on how to apply and use Web 2.0 tools to enhance KM practices.

Academic libraries need to enhance the access and use of Web 2.0 tools to enhance KM practices based on various benefits of Web 2.0 tools to enhance KM practices as mentioned by various authors. Hislop (2013), as well as Levy (2009), recommend that in relation to KM practices, Web 2.0 tools are argued to have positive benefits to workers who utilise them and for the organisation that employ them. In terms of workers' benefits, the interactivity of Web 2.0 tools is argued to help empower workers through creating opportunities for them to participate in dialogue and discussion and contribute their knowledge to interpersonal and community discussions. Organisationally, the knowledge created benefits of using Web 2.0 tools will include personal experience, interpersonal communication and interaction, and sharing and co-creation of knowledge among those who actively participate in Web 2.0 platforms. Further, the internet-based nature of these technologies means that people can participate in them irrespective of their geographical location (Hislop 2013).

In other words, academic libraries use various Web 2.0 tools to network people especially those in scattered geographical areas, for example, social networking is a sort of networking service that uses software to build online social networks for communities of people who share interest and activities or who are interested in exploring the interests and activities of others. Steininger et al. (2010) also add that Web 2.0 tools facilitate rich communication and interaction which allow people to develop a sense of community and shared the identity, and which may even facilitate the sharing tacit knowledge.

Academic libraries should rethink of applying various categories of Web 2.0 tools which are specifically geared to enable people to create and share knowledge. Not all categories of Web 2.0 tools could be employed to enhance KM practices. The study also recommended that academic libraries need to employ few and simple categories of Web 2.0 tools to enhance the access and usage of Web 2.0 tools to enhance KM practices.



### **7.3.8 Recommendation on the factors that affect the application Web 2.0 tools to enhance KM practices**

Jennex and Olfman (2000) provide the following recommendations which could be used to design a successful KMS model:-

- (a) Develop a good technical infrastructure by using a common network structure; adding KM skills to the technology support skill set; using high-end PCs, integrated databases, and standardising hardware and software across the organisation;
- (b) Incorporate the KMS into everyday processes and IS by automating knowledge capture;
- (c) Have an enterprise-wide knowledge structure;
- (d) Have senior management support;
- (e) Allocate maintenance resources for KMS;
- (f) Train employees on use and content of the KMS;
- (g) Create and implement a KM Strategy/Process for identifying/maintaining the knowledge base;
- (h) Expand system models/life cycles to include the KMS and assess system/process changes for impact on the KMS;
- (i) Design security into the KMS; and
- (j) Build motivation and commitment by incorporating KMS usage into personnel evaluation processes, implementing KMS use/satisfaction metrics, and identifying organisational culture concerns that could inhibit KMS usage.

Academic libraries should take advantages of a wide range of Web 2.0 functions and services to add value to their Web 2.0 services and strengthen library staff's usage intention. Library staff should also focus on enhancing the quality of knowledge created within their libraries to raise users' satisfaction and intention to reuse Web 2.0 tools. Library staff should also develop means to monitor online content to ensure good quality of knowledge created within the academic environment including user generated content. The users' intention to continue using Web 2.0 tools can increase due to the high level of users' satisfaction thus being able to account for high investment costs involved in developing and maintaining the Web 2.0 services in academic libraries. Lastly, library staff should ensure that Web 2.0 services are reliable, available and user-friendly to increase the usage of Web 2.0 tools in academic libraries in Tanzania and Africa in general.

### **7.3.9 Recommendations on the challenges that hinder the application of Web 2.0 tools to enhance KM practices**

The study findings identified a number of challenges that hinder the application of KM practices and the challenges that hinder the application of Web 2.0 tools to enhance KM practices in academic libraries. Various challenges were mentioned in both categories; therefore this study recommends that academic libraries and their parent organisations need to find ways to pre-empt and prohibit them in the future. Academic libraries need to build teamwork to minimise the challenges mentioned. Teamwork must involve stakeholders, policy makers, decision makers and librarians.

### **7.4 Proposed integrated and inclusive framework for application of Web 2.0 tools and KM practices in academic libraries in Tanzania**

This study employed Knowledge Creation Model (SECI Model) to explain the creation and sharing of knowledge practices in academic libraries in Tanzania. This study employed Web 2.0 SECI Driven Model again to explain the functionalities of various Web 2.0 tools in creation and sharing of knowledge in academic libraries. In addition, Web 2.0 tools SECI Driven Model was used to link various activities as identified under each SECI processes and Web 2.0 tools such as Facebook, Twitter and Blogs. On top of that, this study developed a conceptual framework which was adapted, validated and modified to fit this study. This study adopted Jennex and Olfman KMS Success Model (Jennex and Olfman 2003). KMS success model used in this study combined and linked all other factors as explained in the other mentioned models (SECI Model and Web 2.0 SECI Driven Model).

Frameworks are “simplifications of reality ways of reducing complexities to a set of meaningful manageable ideas”(Conway 1986:394). Ngulube, Mathipa, and Gumbo (2014:47) further explain that a framework shows the “relationship between concepts and their impact on a phenomenon being investigated”. Besides the framework adopted and then modified to guide this study, the same study employed theories and models to enhance the application of Web 2.0 tools to enhance KM practices in academic libraries. Figure 7.4:1 presents an application of Web 2.0 tools and KM practices framework.



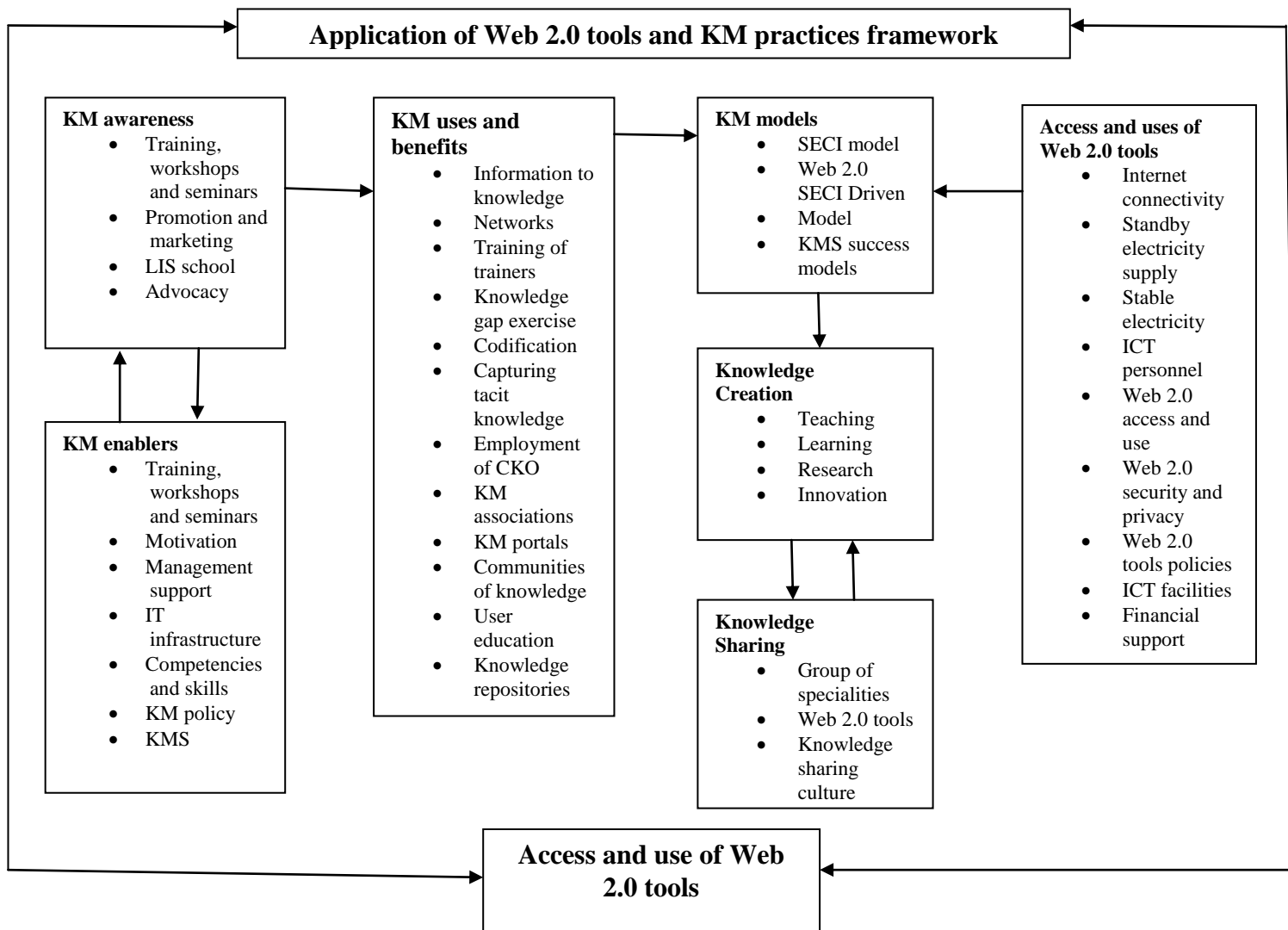


Figure 7.4:1 The application of Web 2.0 tools and KM practices framework

### 7.4.1 Proposed framework

The framework is based on the findings of this study as presented in Chapter Five and Six as well as the review of the literature as reported in the third chapter of this thesis. The application of SECI Model, Web 2.0 Driven SECI Model and KMS success model in this study provided the functionalities of Web 2.0 tools to support KM practices in academic libraries.

Reviewing literature and findings of this study revealed that KM practices were there even before the emergence of Web 2.0 tools and other collaborative tools. The emergence of Web 2.0 tools makes the KM practices better by hindering the barriers which prohibit the application of KM practices. Generally,

KM practices involve the creation, storage and sharing of knowledge among people. However, the emergence of Web 2.0 tools enhances the KM practices by providing tools used to enhance creation and sharing of knowledge. (Majchrzak, Wagner and Yates (2013) add that Web 2.0 technologies enhance KM and usually involve more people to collaborate when creating knowledge.

The research problem outlined in Chapter one highlights the need to integrate Web 2.0 tools to enhance KM practices in academic libraries. Further, the objectives of the study point out the key factors that may help to develop and to implement KM practices as well as how Web 2.0 tools could be used to support KM practices in academic libraries. KM enablers specify how various factors could be used to enhance the application of KM practices. The study also presented the needs of KM awareness and what are the benefits of KM practices in academic libraries.

The proposed framework aims at assisting library staff to apply Web 2.0 tools to enhance KM practices. This framework attempts to establish the link between the research problem and the proposed solution for this study, therefore justifying the need for this inclusive and integrated framework for the application of Web 2.0 tools to enhance KM practices.

#### **7.4.2 Justification of the framework**

The framework is justifiable due to the following facts:-

- (a) Lack of KM awareness in academic libraries;
  - (b) KM enablers were not considered regularly;
  - (c) KM benefits and uses were not discussed and documented for the development of academic libraries;
  - (d) Some of KM practices were conducted in academic libraries unknowingly;
  - (e) Knowledge creation was considered important; however such knowledge was not communicated and shared among members;
  - (f) Lack of knowledge sharing culture in academic libraries;
  - (g) Inadequate access and uses of Web 2.0 tools in academic libraries despite the fact that majority of library staff was aware of Web 2.0 tools;
  - (h) Lack of application of Web 2.0 tools to enhance KM practices in academic libraries;
  - (i) Lack of models and theories to support the creation and sharing of knowledge and to identify factors that affect the application of Web 2.0 tools to enhance KM practices in academic libraries;
- and

- (j) Challenges that hinder the application of Web 2.0 tools to enhance KM practices were not known and discussed in academic libraries.

### **7.4.3 Explanation of the framework**

This framework attempts to show and link factors that could lead to the effective application of Web 2.0 tools to enhance KM practices in academic libraries. It was based on information gathered from the literature review and the findings of the study. Figure 7.4:1 outlines that there are quite a number of issues to consider for the effective application of Web 2.0 tools to enhance KM practices in academic libraries.

The framework points out five factors in an attempt to indicate that the success of integrating KM practices under the light of Web 2.0 tools is dependent on more than one factor. Therefore, the fact is that a range of factors may contribute to the application of Web 2.0 tools and KM practices in academic libraries. A variety of elements is linked to each factor using lines, depicting the relationship between these factors and other elements. Each factor and its respective elements are all ultimately linked to planning, implementing, and evaluating the application of Web 2.0 tools and KM practices project.

The framework may enable academic libraries in the planning and implementation of Web 2.0 tools and KM practices and in what ways do the two these interrelated. This should be done with the consideration of each factor described in the top layer of the framework's hierarchical structure and the related elements. These are described in the following sub-sections as follows:

#### **7.4.3.1 KM awareness**

Based on the fact that KM application was developed since early 1990s the concept is still new to a majority of library staff and other academicians working in higher learning institutions. This was also revealed by this study finding which indicated a low level of KM awareness in the majority of library staff working in academic libraries in the country. KM awareness is very critical among library staff. This is due to the fact that awareness will help to make the application of the concept to work thus to improve the quality of work among librarians.

Krishnamurthy and Balasubramani (2012) add that the awareness of KM process among librarians has an added value to the library and its parental institution. KM helps to determine the direction for the library to improve the quality of service, with the support of the KM concepts. The IFLA KM section promotes the role of librarians and libraries that can, in the knowledge age, take charge of KM in their respective organisations to leverage intellectual assets and facilitate knowledge creation and sharing (IFLA 2016).

The study has raised the following measures to be implemented in the academic libraries worldwide:-

- (a) Raises the awareness of KM among libraries, librarians and their institutions;
- (b) Promotes the enhancement of the mission of libraries by harnessing the principles of KM;
- (c) Identifies and shares best practices;
- (d) Disseminates the results of relevant research;
- (e) Provides connections that help librarian KM practitioners from all regions and speciality areas to develop skills and expertise, while expanding their professional network; and
- (f) Maintains close contact with other IFLA sections, integrating KM into IFLA and the library and information community (IFLA 2016).

Among the motives which were mentioned to create KM awareness among library staff include training, workshops and seminars, promotion and marketing, the establishment of LIS schools and advocacy.

#### **7.4.3.2 KM enablers**

The framework has explained the importance of KM enablers for the application of KM practices. KM enablers were reported as among the factors that hinder the application of KM practices in the majority of organisations. Ichijo, Krough and Nonaka (1998) add that KM enablers are also the necessary building blocks in the improvement of the effectiveness of activities for KM. KM enablers such as organisational culture, management support, IT support, KM policies and procedures, competencies and skills were mentioned in this study. For example, IT support was mentioned as among the important KM enablers in this age of Science and Technology.

The role of IT as among the KM enablers refers to the fundamental building block of information technology that supports and coordinates KM which includes database, knowledge platform, performance evaluation management system, and integrated performance support system, etc. (Beckman 1999). Hence, IT can enable rapid search, access and retrieval of information, and can support collaboration and communication between organisational members. In essence, it can certainly play a variety of roles to support an organisation's KM practices (Alavi and Leidner 2001; Wong 2005). Yeh, Lai and Ho (2006) suggest that IT and KM are closely tied together because both help the propagation of structured knowledge vertically as well as horizontally within the organisation. They also make searching and using knowledge much easier.

#### **7.4.3.3 KM uses and benefits**

Academic libraries need to conduct knowledge gap exercise to determine who knows what within the organisation. This exercise will help academic libraries to deal with specialities of various knowledge areas thus, to manage and organise knowledge according to such specialities. Academic libraries also need to codification process. As it was pointed earlier that much of the knowledge of employees within organisations is tacit and cannot be communicated, shared and documented for future use (Hislop 2013:57). As well defined in the previous sub-sections that, codification is the process of transferring knowledge from people to documents (Hislop 2013:57); thus, it is argued that codification process is centrally concerned with creating searchable repositories for the storage and retrieval of codified knowledge. Further academic institutions need to motivate their employees to contribute their tacit knowledge to be codified and then shared and preserved for future use.

Academic libraries need to employ CKO who will assess and deal with all the activities concerning the application of KM practices and to educate users (library staff and library users) on the uses and benefits of KM practices in the organisation. The study findings have proposed that majority of such uses and benefits of KM practices are not known, discussed and documented for the development of the institution. Academic libraries need to make sure that, KM uses and benefits are known and discussed regularly among library staff.

#### **7.4.3.4 KM practices**

KM practices include knowledge creation, transfer, sharing, acquisition and generation. This study employed only knowledge creation and sharing practices. It is believed that in the academic environment, knowledge can be created through teaching, learning, research and innovation. This is due to the nature of this study that was conducted in the academic environment where knowledge is created and shared daily. Therefore, the study framework proposed that academic institutions must ensure new knowledge is created and then shared for the benefit of the entire academic environment. In addition, knowledge sharing is about communicating knowledge by and with a group of people.

There are various groups of specialities and other groups which people can share knowledge among themselves. The framework also proposed that knowledge sharing can be facilitated by the use of Web 2.0 tools. Knowledge sharing is also facilitated by the knowledge sharing culture. The framework has proposed the need of having knowledge sharing culture to facilitate the application of KM and knowledge sharing. Further, the framework has included the importance of models and theories to explain the



creation and sharing practices. This study used SECI Model, Web 2.0 Driven SECI Model and KMS Success Model.

#### **7.4.3.5 Access and use of Web 2.0 tools**

The framework provides the access and use of Web 2.0 tools for innovative service delivery in academic libraries. This study finding provides the conclusion that the access and use of Web 2.0 tools in academic libraries is still low. The access and use of Web 2.0 tools in academic will help to improve library services and also to enhance and facilitate the application of KM practices. This will make the knowledge flow between one point and another and reach a number of users wherever they are. Therefore, academic institutions must ensure the availability of the following: Internet connectivity, Standby electricity supply, Stable electricity, ICT personnel, Web 2.0 access and use, Web 2.0 security and privacy, Web 2.0 policies, ICT facilities and financial support.

#### **7.5 Implications of the study**

The findings of this study are similar to the findings of other researchers Akeriwa, Penzhorn, and Holmner (2014), Hosseini and Hashempour (2012), Islam, Agarwal, and Ikeda (2014), Kim and Abbas (2010), Mavodza (2010), Mosha, Holmner, and Penzhorn (2015), and Mtega et al. (2014). The difference between this study and the others is that majority of the studies were focused on the KM practices and Web 2.0 tools in general, while this study focused on the knowledge creation and sharing practices only. In addition, some of such studies focused on knowledge sharing only because it seems that people could easily use Web 2.0 tools to share knowledge than to do other KM practices such as knowledge creation, knowledge acquisition, knowledge evaluation, knowledge capturing, knowledge retrieving and knowledge identification. On the other hand, most of such studies did not use theories and/models to guide their studies and if so only one theory or model was used to guide their studies.

This study has used four models which include Academic Library 2.0 Concept Model, Knowledge Creation Theory (SECI processes), Web 2.0 Driven SECI Model and KMS Success Model. KMS Success Model was adopted from Jennex and Olfman KMS Success Model and then validated and modified. These four models are interrelated and were used to guide this study. Academic Library 2.0 Concept Model was used to explain the need for academic libraries to apply Web 2.0 tools to improve various library services as well as to enhance the application of KM practices in academic libraries. However, the Academic Library 2.0 concept model also specifies that academic libraries can provide both online and traditional services. Knowledge creation model under SECI processes was employed to explain the creation and sharing practices in academic libraries. Each SECI processes provide the number of activities conducted within academic libraries which could lead to creation and sharing of knowledge.

In addition, this study has employed Web 2.0 Driven SECI Model. Web 2.0 Driven SECI Model were used to link various activities as identified under SECI processes and how such functions could be linked with Web 2.0 tools to enhance the creation and sharing of knowledge. This study has employed the KMS Success Model. The KMS Success Model was adopted from Jennex and Olfman KMS Success Model and then validated to fit this study. The KMS Success Model was used to investigate factors which affect the application of Web 2.0 tools to enhance KM practices in academic libraries. In this study, Web 2.0 tools were regarded as KMS. Thus, the proposed model is targeting at promoting and supporting the application of Web 2.0 tools to enhance KM practices in academic libraries.

Most of the academic libraries have reported that they did not have KM enablers for the application of KM practices in academic libraries. The study observed the lack of various KM enablers such as KM policy and guidelines, IT infrastructure, competencies and skills, management support and organisational culture to support the application of Web 2.0 tools to enhance KM practices. One of the recommendations made by this study was the need for such KM enablers in each academic library. This could contribute towards ending the marginalisation of the application of Web 2.0 tools and KM practices integration at academic libraries. As a result, this could lead to more funds and initiatives for KM and Web 2.0 programmes, collaborated KM and Web 2.0 projects, and outreach training towards the application of both Web 2.0 tools and KM in academic libraries.

On the other hand, the access and uses of Web 2.0 tools to improve academic libraries services reported to be low and unplanned. Despite the fact that majority of the visited libraries have websites but they do not link Web 2.0 tools to such websites for innovative service delivery in their libraries. Web 1.0 took to information while Web 2.0 will take information to the people (Harinarayana and Vasantha Raja 2010); thus, academic libraries need to integrate Web 2.0 features such as Really Simple Syndication (RSS), Blogs, Wikis, user tagging sites (del. icio.us, furl, dig etc) instant messaging, and SNS like Facebook, and MySpace into their library websites.

The research methodology applied in this study had positivist underpinning. The survey method was used as the main data collection method. The triangulation of research methods (questionnaire, semi-structured interviews and observation) made it possible to determine the status quo for the application of Web 2.0 tools to enhance KM practices in academic libraries and development of a framework that could guide on the application of Web 2.0 tools to enhance KM practices in academic libraries. Therefore, a triangulation

of methods, such as surveys, semi-structured interviews and observations, may be considered by other researchers as a suitable research strategy to investigate the application of Web 2.0 and KM practices.

## **7.6 Suggestions for future research**

In view of our findings, the following suggestions for future research can be made:-

- (a) Short and long term prospective studies are needed to evaluate the range of factors associated with the application of Web 2.0 tools to enhance KM practices in higher learning institutions in Tanzania and in Sub Saharan African (SSA).
- (b) In SSA setting, shortage of staff and limited resources is common in higher learning institutions. The practice of KM using Web 2.0 tools may, therefore, be challenging. Therefore to apply and use Web 2.0 tools to enhance KM practices in higher learning institutions, there is a need to call for further studies to establish easier and low cost effective way of applying Web 2.0 tools to enhance KM practices in a higher learning institution.
- (c) Investigate the access and use of Web 2.0 tools to enhance knowledge creation and sharing among students and lecturers in higher learning institutions.
- (d) Examine the factors that affect knowledge creation and KM in institutions of higher learning in Tanzania and Africa.

## **7.7 General conclusion**

The use and application of Web 2.0 tools to enhance KM practices in organisations is a contemporary issue particularly in developing countries like Tanzania; where the deployment of the tools has become necessary. However, the access and use of Web 2.0 tools in academic has still been in the infant stage and this calls for an urgent need to put a priority on such tools due to a number of especially in communication and participation online. There is a need to evaluate Web 2.0 tools and identify factors that support the application of Web 2.0 tools in our libraries.

KM is a new arena in its execution, but it had a name before. This means that KM is not new as we think. Libraries have been applying KM practices without knowing. Thus, what we need is to name and make KM activities known to the users and other stakeholders in our libraries. This could be facilitated by motivating staff from lower to higher carders. This is to alert us that KM enablers are very important because each enabler touches the humanity.

Generally, the findings of this research work suggest that Tanzania is still in a good transitioning period as other developing countries and the use of Web 2.0 tool in most of the academic agendas indicates a good vision which is bringing a new era of the use of Science and Technology to foster education in the country. In comparison, many studies have recommended on the importance of policies in both KM and Web 2.0 application; however, more research is needed to make an evaluation on whether these fairly limited policies are likely to have much on the factors that affect the application of Web 2.0 tools to enhance KM strategy.

## REFERENCES

- Abbott, ML. and McKinney, J. 2013. *Understanding and applying research design*. New Jersey: John Wiley and Sons.
- Abram, S. 1997. Post information age positioning for special librarians: is knowledge management the answer? *Information Outlook*, 1(6): 18–23.
- Abram, S. 2007. Web 2.0, library 2.0 and librarian 2.0: preparing for the 2.0 world. In *Online information proceedings*: 6–8.
- Abrams, LC., Cross, R., Lesser, E. and Levin, D. 2003. Nurturing interpersonal trust in knowledge-sharing networks. *Academy of Management Executive* 17: 64–79.
- Adams, A. and Cox, A. 2008. Questionnaires, in-depth interviews and focus groups. In *Research methods for human computer interaction*, edited by A. Cairns and P. Cox. Cambridge, UK: Cambridge University Press: 17–34.
- Adams, GL. and Lamont, B. 2003. Knowledge management systems and developing sustainable competitive advantage. *Journal of Knowledge Management* 7(2):142–154.
- Adekunle, PA., Omoba, RO. and Tella, A. 2007. Attitudes of librarians in selected Nigerian Universities toward the use of ICT. *Library Philosophy and practice*: 1-8.
- Adeyoyin, S. 2006. ICT literacy among the staff of West African University Libraries: A comparative study of Anglophone and francophone countries. *The Electronic Library* 24(5): 694–705.
- Agarwal, NK. and Islam, MA. 2014. Knowledge management implementation in a library. Mapping tools and technologies to phases of the KM cycle. *Vine* 44(3): 322–344.
- Aharony, N. 2009. Web 2.0 use by librarians. *Library and Information Science Research* 31(1): 29–37.
- Ahlquist, J. 2010. *Quantitative methodologies in international encyclopedia of political science*. New York: CQ Press.
- Akamavi, N and Kimble, C. 2005. *Knowledge sharing and computer supported collaborative work: the role of organizational culture and trust*. Heslington, England: The University of York.
- Akeriwa, M., Penzhorn, C. and Holmner, M. 2015. Using mobile technologies for social media based library services at the University of Development Studies. *Information Development* 31(3): 284–293.
- Al-Alawi, AI., Al-Marzooqi, NY. and Mohammed, Y. 2007. Organizational culture and knowledge sharing: critical success factors. *Journal of Knowledge Management* 11(2): 22–42.
- Alavi, M. and Leidner, D. 2001. Knowledge management and knowledge management systems: conceptual foundations and research issues. *MIS Quarterly* 25(1):107–137.
- Alavi, M. and Leidner, D. 1999. Knowledge management systems: issues, challenges, and benefits.

- Communications of the AIS* 1(7): 1–27.
- Alazmi, M. and Zairi, M. 2003. Knowledge management critical success factors. *Total Quality Management* 14(2): 199–204.
- Altbach, P. 2005. The private higher education revolution: an introduction. In *Private higher education: a global revolution*, edited by P. A. Altbach and D. Levy. Rittterdam, The Netherlands: Sense Publishers: 1–13.
- Anderson, J. 1993. *The Architecture of Cognition*. Massachusetts: Harvard University Press, Cambridge.
- Apostolou, D. and Mentzas, G. 1999. Case study managing corporate knowledge: a comparative analysis of experiences in consulting firms. *Knowledge and Process Management* 6(3): 129–138.
- Ardichvili, A., Page, V. and Wentling, T. 2003. Motivation and barriers to participation in virtual knowledge-sharing communities of practice. *Journal of Knowledge Management* 7(1): 64–77.
- Arora, R. 2002. Implementing knowledge management: a balanced score card approach. *Journal of Knowledge Management* 6(3): 240–249.
- Artail, H. 2006. Application of KM measures to the impact of a specialized groupware system on corporate productivity and operation. *Information and Management* 43: 551–564.
- Arya, HB. and Mishra, JK. 2012. Oh! Web 2.0, virtual reference service 2.0, tools and techniques (II). *Journal of Library and Information Services in Distance Learning* 6(1): 28–46.
- Arya, HB. and Mishra, JK. 2012. Oh! Web 2.0, virtual reference service 2.0, tools and techniques (I). A Basic Approach. *Journal of Library and Information Services in Distance Learning* 5(4): 149–171.
- Asogwa, B. 2012. Knowledge management in academic libraries: libraries in the 21st century. *Journal of Knowledge Management Practice* 13(2): 1–11.
- Assan, J. 2006. Writing the conclusion chapter: the good, the bad and the missing. Available at: [http://www.devstud.org.uk/downloads/4be165997d2ae\\_Writing\\_the\\_Conclusion\\_Chapter,\\_the\\_Good,\\_the\\_Bad\\_and\\_the\\_Missing,\\_Joe\\_Assan%5B1%5D.pdf/](http://www.devstud.org.uk/downloads/4be165997d2ae_Writing_the_Conclusion_Chapter,_the_Good,_the_Bad_and_the_Missing,_Joe_Assan%5B1%5D.pdf/) (Accessed 12 March 2016).
- Ayiah, EM. and Kumah, C. 2011. Social networking: a tool to use for effective service delivery to clients by African Libraries. Available at: [www.confrence.ifla.org/past-wlic/2011/183-ayiah-en.pdf/](http://www.confrence.ifla.org/past-wlic/2011/183-ayiah-en.pdf/) (Assessed 5 January 2016).
- Ayu, ARR. and Abrizah, A. 2011. Do you Facebook? Usage and applications of Facebook page among academic libraries in Malaysia. *International Information and Library Review* 43(4): 239–249.
- Azudin, N., Ismail, MN. and Taherali, Z. 2014. Knowledge sharing among workers: a study on their contribution through informal communication in Cyberjaya, Malaysia. *Knowledge Management and E-Learning: An international Journal* 1(2): 139–162.
- Babbie, J. and Mouton, J. 2001. *The practice of social research*. Cape Town: Oxford University Press Southern Africa.

- Babbie, E. 2011. *The basics of social research*. 14<sup>th</sup> ed. Belmont, CA: Cengage Learning.
- Babbie, E. 2010. *The practice of social research*. 12<sup>th</sup> ed. Southbank, Victoria: Thomson Wadsworth.
- Babbie, E. and MJ. 2009. *The practice of social research*. Cape Town: Oxford University Press Southern Africa.
- Baddi, A. and Sharif, A. 2003. Information management and knowledge integration for enterprise innovation. *Logistics Information Management* 16(2):145–55.
- Baert, P. 2005. Towards a pragmatist-inspired philosophy of social science. *Acta Sociologica* 48(3):191 – 203.
- Bagozzi, R., Yi, Y. and Phillips, L. 1991. Assessing construct validity in organizational research. *Administrative Science Quarterly* 36(3): 421–458.
- Bailey, C. 1996. *A guide to field research*. Thousand Oaks, CA: Pine Forge Press.
- Bainton, T. 2001. Information literacy and academic libraries: the SCONUL approach (UK/Ireland). Paper presented at the user education workshop. 67th IFLA Council and General Conference held at Boston, USA 16th -25th, August 2001.
- Baker, L. 2006. Observation: a complex research method. *Library Trends* 55(1): 171–180.
- Banhanyi, S. 2007. A knowledge engine driving Africa's development. [www.kmafrica.info/news,5-18/](http://www.kmafrica.info/news,5-18/) (Accessed on 17 October 2015).
- Barbour, R. 1998. Mixing qualitative methods: quality assurance or qualitative quagmire? *Qualitative Health Research* 8(3): 352–361.
- Baskerville, R. and Dulipovici, A. 2006. The theoretical foundations of knowledge management. *Knowledge Management Research & Practice* 4:83–105.
- Bebensee, T., Helms, R. and Spruit, M. 2011. Exploring Web 2.0 application as a mean of bolstering up knowledge management. *The Electronic Journal of Knowledge Management* 9(1): 1–9.
- Becerra-Fernandez, I., Gonzalez, A. and Sabherwal, R. 2004. *Knowledge management: challenge, solutions and technologies*. Upper Saddle River: Prentice-Hall.
- Becerra-Fernandez, I. and Sabherwal, R. 2001. Organization knowledge management: contingency perspective. *Journal of Management Information Systems* 18(1): 23–55.
- Beckman, T. 1999. The current state of knowledge management. In J. Liebowitz, ed. *Knowledge management handbook*. Boca Raton: CRC Press.
- Bejune, M. 2007. Wikis in libraries. *Information Technology in Libraries* 26:26–38.
- Bem, R., Coelho, C. and Reinisch, D. 2013. Applications of knowledge management in the era of librarianship and information science: a systematic review. *Brazilian Journal of Information Science* 7(1): 67–93.
- Berners-Lee, T. 2006. Developer works interviews.

- <http://www.ibm.com/developerworks/podcast/dwi/cm-int082206txt.html> (Accessed 30 December 2015).
- Berry, D. 2014. Five steps to create a culture of knowledge sharing. <http://data-informed.com/five-steps-create-culture-knowledge-sharing/> (Accessed 30 April 2016).
- Bharati, P. and Chaudhury, A. 2006. Product customization on the web: an empirical study of factors impacting choiceboard user satisfaction. *Information Resources Management Journal* 19(2): 69–81.
- Bhatt, GD. 2002. Management strategies for individual knowledge and organizational knowledge. *Journal of Knowledge Management* 6(1): 31-39.
- Bishop, K. 2001. Leveraging our knowledge: the skills and attributes information professionals bring to new roles in information and knowledge management. Paper presented at ALIA Conferences: 9th Specials, Health and Law Libraries Conference. <http://conferences.alia.org.au/shllc2001/papers/bishop.2.html> (Accessed 27 September 2015).
- Blacker, F. 1995. Knowledge, knowledge work and organisations: an overview and interpretation. *Organisation Studies* 16(6).
- Blair, D. 2002. Knowledge management: hype, hope or help?. *Journal of the American Society for Information Science and Technology*. 53(12): 1011–1028.
- Blaxter, L., Hughes, C. and Tight, M. 2010. *How to research*. 4<sup>th</sup> ed. Berkshire: McGraw- Hill/Open University Press.
- Boateng, F. and Liu, Y. 2014. Web 2.0 applications' usage and trends in top US academic libraries. *Library Hi Tech* 32(1): 120–138.
- Borbas, S., Jackson, D. and Langford, R. 2004. *Navigating the maze of nursing research: an interactive learning adventure*. Philadelphia: Mosby.
- Borgman, CL. and Furner, J. 2002. Scholarly communication and bibliometrics. *Annual Review of Information Science and Technology* 36(1): 62–72.
- Borzillo, S., Azner, S. and Schimitt, A. 2011. A journey through communities of practice: how and why members move from periphery to the core. *European Management Journal* 29: 25–42.
- Boulos, KMN. and Wheeler, S. 2007. The emerging Web 2.0 social software: an enabling suite of sociable technologies in health and health care education. *Health information and libraries journal* 24(1): 2–23.
- Boyatzis, R. 1998. *Transforming qualitative information: thematic analysis and code development* London: Sage.
- Boyd, DM. and Ellison, N. 2008. Social network sites: definition, history and scholarship. *Journal of Computer-Mediated Communication* 13:210–230.
- Bozbura, F. 2007. Knowledge management practices in Turkish SMEs". *Journal of Enterprise*



- Information Management* 20(2): 209–221.
- Bradley, P. 2007. *How to use Web 2.0 in your library*. London: Facet Publishing.
- Branin, J. 2003. Knowledge Management in Academic Libraries : Building the Knowledge Bank at the Ohio State University: An evolution towards knowledge management. *Library* 82:1–17.
- Braun, V. and Clarke, V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology* 3(2): 77–101.
- Bray, T. 2005. Not 2.0: Weblog post. <http://www.tbray.org/ongoing/When/200x/2005/08/04/Web-2.0> (Accessed 12 February 2016).
- Britt, P. 2005. RSS investors: there's gold in supporting them thar standards. *EContent* 28(9): 8.
- Broadband Report. 2012. The state of broadband 2012 achieving digital inclusion for all: a report by the broadband commission. [www.broadbandcommission.org](http://www.broadbandcommission.org) (Accessed 24 December 2015).
- Bruce, C. 2004. Information literacy as a catalyst for educational change: a background paper. Paper presented at the 3<sup>rd</sup> International Life Long Learning Conference, Yeppoon, Queensland 13-16 June 2004.
- Bryman, A. 2004. *Social research methods*. 2<sup>nd</sup> ed. Oxford: Oxford University Press.
- Bryman, A. 2005. Multi-method research. <http://www.referenceworld.com/sage/socialscience/mmr.pdf> (Accessed 14 February 2015).
- Bryman, A. 2006. Integrating quantitative and qualitative research: how is it done? *International Journal of Social Research Methodology* 10(1): 5-20.
- Bryman, A. 2008. *Social research method*. 3<sup>rd</sup> ed. Toronto: Oxford University Press.
- Bryman, A. 2012. *Social research methods*. 4<sup>th</sup> ed. Oxford: Oxford University Press.
- Bunton, D. 2005. The structure of PhD conclusion chapters. *Journal of English for Academic Purposes* 4 (3): 207-224.
- Campbell, DT. and Fiske, D. 1959. Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin* 56(2): 81–105.
- Cardinal, LB., Alessandri, TM. and Turner, S. 2001. Knowledge codifiability, resources, and science based innovation. *Journal of Knowledge Management* 5(2): 195–204.
- Carscaddon, L. and Chapman, K. 2013. Twitter as a marketing tool for libraries. In *Marketing with Social Media: A LITA Guide*, edited by B. Thomsett- Scott. Chicago: American Library Association.
- Carson, D., Guilmore, A., Perry, C. and Gronhaug, K. 2001. *Qualitative marketing research*. London: Sage Publications.
- Casey, ME. and Savastinuk, L. 2006. Library 2.0 service for the next generation library. <http://cil733.pbworks.com/f/Library+2.0+Journal.pdf> (Accessed 26 April 2014).
- Casey, M., 2005. Librarians without borders. *LibraryCrunch*.

- [http://www.librarycrunch.com/2005/09/librarians\\_without\\_borders.html/](http://www.librarycrunch.com/2005/09/librarians_without_borders.html/) (Accessed 26 July 2014).
- Cates, J. 2001. CKO wanted. *Business and Finance Division Bulletin* 118: 25–28.
- Cavusgil, ST., Calantone, RJ. and Zhao, Y. 2003. Tacit knowledge transfer and firm innovation capability. *Journal of Business & Industrial Marketing* 18(1): 6–21.
- Cecez-Kecmanovic, D. and Kennan, MA. 2013. The methodological landscape: Information systems and knowledge management. In *Research methods: Information, systems and contexts*, edited by K. Williamson and G. Johnson. Prahran.: Tilde: 123–133.
- Celine, C. 2011. Difference between models and theories. Available: <http://www.differencebetween.net/language/words-language/difference-between-models-and-theories/> (Accessed 16 January 16, 2016).
- Chai, S. and Kim, M. 2010. What makes bloggers share knowledge? An investigation on the role of trust. *International Journal of Information Management* 30(5): 408–415.
- Chan, HR. 2010. Murdoch University Library : A Web 2 . 0 Journey. Paper presented at the ALSR 2010: Conference towards Future Possibilities. Available: [http://ira.lib.polyu.edu.hk/bitstream/10397/1745/1/Session10B\\_Chan.pdf](http://ira.lib.polyu.edu.hk/bitstream/10397/1745/1/Session10B_Chan.pdf) (Accessed 15 April 2015).
- Chandra, S. 2005. *Library and information technology*. New Delhi: Shree Publishers and Distributors.
- Chang, H. and Chuang, S. 2011. Social capital and individual motivations on knowledge sharing: participant involvement as a moderator. *Information and Management* 48: 9–18.
- Charnigo, L. and Barnett-Ellis, P. 2007. Checking out Facebook.com: the impact of a digital trend on academic libraries. *Information Technology and Libraries* 26(1): 23–34.
- Chase, R. 1998. Knowledge navigators. Available: <http://www.sla.org/pubs/serial/io/1998/sep98/chase1.html> (Accessed 09 August 2014).
- Chase, R. 1997. The knowledge-based organization: an international survey. *Journal of Knowledge Management* 1(1): 38–49.
- Chatti, MA., Klamma R., Jarke M. and Naeve, A. 2007. The Web 2.0 driven SECI model based learning process. Paper presented at Seventh IEEE International Conference on Advanced Learning Technologies, 5(Icalt), pp.780–782.
- Che Rusuli, MS., Tasmin, R., Takala, J. and Norazlin, H. 2012. Knowledge Management Process at Malaysian University Libraries: A review. *International Journal of Social Sciences* 1: 1–16.
- Chen, J., Zhaohui, Z. and Xie, H. 2004. Measuring intellectual capital. *Journal of Intellectual Capital* 5(1): 195–212.
- Chen, XH., Snyman, MMM. and Sewdass, N. 2005. Interrelationship between document management, information management and knowledge management. *South African Journal of Information Management* 7(3):1–19.

- Cheng, M., Ho, J. and Lau, P. 2009. Knowledge sharing in academic institutions: a study of multimedia university Malaysia. *Electronic Journal of Knowledge Management* 7(3): 313–324.
- Cherryhomes, C. 1992. Notes on pragmatism and scientific realism. *Educational Researcher* 21(6): 13 – 17.
- Chigada, J. 2014. The role of knowledge management in enhancing organisational performance in selected banks in South Africa. PhD Thesis, University of South Africa (UNISA), Pretoria. South Africa.
- Ching-Lin, T. 2003. A dynamic view of knowledge sharing behavior in collaborative virtual team, in program for promoting university academic excellence annual prospectus report for year 2003. An Integrated Study on Knowledge Economy and Electronic Commerce, National Sun Yat-sen, University and National Central University. Guangzhou.
- Chireshe, R. 2015. Quantitative data analysis and interpretation: key elements. In *Addressing research challenges: making headway for the developing researchers*, edited by ER. Mathipa and MT. Gumbo. Noordwyk: Mosala-Masepi Publishers: 109–130.
- Chiu CM, Sheng, C. and Chang, HC. 2007. Examining the integrated influence of fairness and quality on learners' satisfaction and Web-based learning continuance intention. *Information Systems Journal* 17(3): 271–287.
- Cho G., Jerrel, H. and W. Landay, 2000. Program Management: Know the Way How Knowledge Management Can Improve DOD Acquisition. Defense Systems Management College, Fort Belvoir.
- Choi, B. and Lee, H., 2002. Knowledge management strategy and its link to knowledge creation process. *Expert Systems with Applications* 23: 173–187.
- Choi, B., Poon, SK. and Davis, JG. 2008. Effects of knowledge management strategy on organizational performance: A complementarity theory-based approach. *Omega* 36(2): 235–251.
- Choo, C. 2000. Working with knowledge: how information professionals help organisations manage what they know. *Library Management* 21(8): 395–403.
- Chou, SW., Min, HT., Chang, YC. and Lin, CT. 2010. Understanding continuance intention of knowledge creation using extended expectation–confirmation theory: an empirical study of Taiwan and China online communities. *Behaviour and Information Technology* 29(6): 557–570.
- Chu, S.K.-W. & Kennedy, D.M., 2011. Using online collaborative tools for groups to co-construct knowledge. *Online Information Review*, 35(4), pp.581–597.
- Chua, AYK., Goh, DH. and Ang, R. 2012. Web 2.0 applications in government web sites: prevalence, use and correlations with perceived web site quality. *Online Information Review* 36(2): 175–195.
- Chua, A. and Goh, D. 2010. A study of Web 2.0 applications in library websites. *Library and Information Science Research* 32(3): 203–211.

- Chu Kai-Wahl, S. 2009. Using Wikis in academic libraries. *Journal of Academic Librarianship* 25:170–176.
- Click, A. and Petit, J. 2010. Social networking and Web 2.0 in information literacy. *International Information and Library Review* 42(2): 137–142.
- Coakes, E. and Clarke, S. 2006. Communities of practice. In *Encyclopedia of knowledge management*, edited by DJ. Schwartz. Hershey: PA: Idea Group Reference: 30–33.
- Cocciolo, A. 2010. Can Web 2.0 enhance community participation in an institutional repository? *The Journal of Academic Librarianship* 36(4): 304–312.
- Cohen, L., Manion, L. and Morrison, K. 2007. *Research methods in education*. 6<sup>th</sup> ed. London: Routledge Falmer.
- Cohen, L. 2007. Social Scholarship on the rise. [http://liblogs.albany.edu/library20/2007/10/information\\_literacy\\_in\\_the\\_ag.html](http://liblogs.albany.edu/library20/2007/10/information_literacy_in_the_ag.html) (Accessed 08 December 2015).
- Cole-Gomolski, B. 1997. Users loath to share their know-how. *Computerworld* 31:46–52.
- Collins, E. and Hide, B. 2010. Use and relevance of Web 2.0 resources for researchers. *Methods*: 271–289.
- Collis, B. and Moonen, J. 2008. Web 2.0 tools and processes in higher education: quality perspectives. *Educational Media International* 45(2): 93–106.
- Conway, P. 1986. Facts and frameworks: an approach to studying the users of archives. *American Archivist* 49: 393–407.
- Cooper, H. 1994. Homework research and policy: A Review of the Literature. University of Minnesota Research/Practice. *Newsletter* 2(2). <http://cehd.umn.edu/CAREI/Reports/Rpractice/Summer94/homework.html>. (Accessed 5 September 2014).
- COTUL, 2011. Consortium of Tanzanian University Libraries. <http://www.cotul.or.tz/index.php/about-cotul/background> (Accessed 5 July 2015).
- Creswell, JW., Fetters, MD. and Ivankova, N. 2004. Designing a mixed methods study in primary care. *Annals of Family Medicine* 2(1):7-12.
- Creswell, JW. and Miller, G. 1997. Research methodologies and doctoral process. <http://www.onlinelibrary.wiley.com/doi/10.1002/he.9903/abstract> (Accessed 9 May 2015).
- Creswell, JW. and Plano-Clark, V. 2011. *Designing and conducting mixed methods research*. 2<sup>nd</sup> ed. Los Angeles: Sage.
- Creswell, JW. and Plano-Clark, V. 2007. *Designing and conducting mixed methods research*. Thousand Oaks: Sage Publications.

- Creswell, J. 1994. *Research design: qualitative and quantitative approaches*. Thousand Oaks, CA: Sage.
- Creswell, J. 2003. *Research design: qualitative, quantitative and mixed methods approaches*. 2<sup>nd</sup> ed. Thousands Oaks: Sage.
- Creswell, J. 2007. *Qualitative inquiry and research design: choosing among five approaches*. 3<sup>rd</sup> ed. Thousand Oaks, CA: Sage.
- Creswell, J. 2007. Understanding mixed methods research. *Qualitative Inquiry and Research Design: Choosing Among Five Approaches* 11(2):1–19.
- Creswell, J. 2009. *Research design: qualitative, quantitative and mixed methods approaches*. Los Angeles: Sage.
- Creswell, J. 2013. *Qualitative inquiry and research design: choosing among five approaches*. 3<sup>rd</sup> ed. Los Angeles: Sage.
- Curran, K., Murray, M. and Christian, M. 2007. Taking the information to the public through Library 2.0. *Library Hi Tech* 25(2): 288–297.
- Cryer P. 2000. *The research student's guide to success*. Buckingham: Open Press.
- Dalkir, K. 2005. *Knowledge management in theory and practice*. Available: <http://www.amazon.com/Knowledge-Management-Theory-Practice-Dalkir/dp/0262015080> \n<http://www.amazon.ca/exec/obidos/redirect?tag=citeulike09-20&path=ASIN/075067864X> (Accessed 23 November 2015).
- Daneshgar, F. and Bosanquet, L. 2010. Organizing customer knowledge in academic libraries. *Journal of Knowledge Management* 8(1): 21 – 32.
- Daneshgar, F. and Parirokh, M. 2007. A knowledge schema for organisational learning in academic libraries. *Knowledge Management Research and Practice* 5:22–33.
- Daneshgar, F. and Parirokh, M. 2012. An integrated customer knowledge management framework for academic libraries. *Library Quarterly* 82(1):7–28.
- Darroch, J. and McNaughton, R. 2002. Examining the link between knowledge management practices and types of innovation. *Journal of Intellectual Capital* 3(3):210–222.
- Dave, B. and Koskela, L. 2009. Collaborative knowledge management: a construction case study. *Automation in Construction* 18(7): 894–902.
- Davenport, TH., DeLong, DW. and Beers, M. 1997. Building successful knowledge management projects. Center for Business Innovation Working paper, Ernst and Young LLP. Available: [http://www.providersedge.com/Docs/Km\\_Articles/Building\\_Successful\\_KM\\_Projects.Pdf](http://www.providersedge.com/Docs/Km_Articles/Building_Successful_KM_Projects.Pdf) (Accessed 14 August 2015).
- Davenport, TH., DeLong, DW. and Beers, M. 1998a. Successful knowledge management projects. *Sloan Management Review* 39(2): 43–57.

- Davenport, TH., DeLong, DW. and Beers, M. 1998b. *Working knowledge: how organisations manage what they know*. Boston: Harvard Business School Press.
- Davenport, TH. and Prusak, L. 1998. *Working knowledge*. Boston: Harvard Business School Press.
- Davenport, T. 1997. Ten principles of knowledge management and four case studies. *Knowledge and Process Management* 4(3):187–208.
- Davenport, T. 1995. Think tank: the future of knowledge management. *CIO* 9(6): 30–31.
- Davenport, T. 2005. What is KM? Available: <http://www.mcombs.utexas.edu> (Accessed 5 July 2015).
- Davenport, T.H., Long, D.W. De & Beers, M.C., 1998. Building Successful Knowledge Management Projects. *Sloan Management Review* 39:43.
- Davis, I. 2005. Web 2.0 and all that. Available: <http://blog.iandavis.com/2005/07/talis-web-20-and-allthat/> (Accessed 23 December 2015).
- De Vaus, D. 2001. *Research design in social research*. London: Sage.
- Delone, WH. and Mclean, E. 1992. Information systems success: the quest for the dependent variable. *Information Systems Research* 3(1): 60–95.
- Delone, WH. and Mclean, E. 2002. Information systems success revisited. In *Proceedings of the 35th Annual Hawaii International Conference on System Sciences (HICSS)*: 2966–2976.
- Delone, WH. and Mclean, ER. 2004. Measuring e-commerce success : Applying the DeLone and McLean information systems success model. *International Journal of Electronic Commerce* 9(1): 37–41.
- Delone, WH. and Mclean, ER. 2014. The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems* 1222:8–30.
- DeLong, DW. and Fahey, L. 2000. Diagnosing cultural barriers to knowledge management. *Academy of Management Executive* 14(4): 113-127.
- Denzin, N. 1970. *The research act in Sociology*. Chicago: Aldine.
- Denzin, N. 1978. *The research act*. 2<sup>nd</sup> ed. Englewood Cliffs, NJ: Prentice Hall.
- Denzin, NK. and Lincoln, Y. 1994. *Handbook of qualitative research*. London: Sage.
- Desouza, K. and Evaristo, R. 2003. Global Knowledge Management Strategies. *European Management Journal* 21(1): 62–67.
- DeTienne, KB., Dyer, G., Hoopes, C. and Harris, S. 2004. Toward a model of effective knowledge management and directions for future research: culture, leadership, and CKOs. *Journal of Leadership and Organizational Studies* 10: 26–43.
- Devaraj, S., FAN, M. and Kohli, R. 2002. Antecedents of B2C channel satisfaction and preference: validating e-commerce metrics. *Information Systems Research* 13(3): 316–333.
- Dewah, P. 2011. Knowledge retention strategies in selected southern African public broadcasting corporations. University of Fort Hare. Available: <http://hdl.handle.net/10353/438> (Accessed 25

- September 2014).
- Dickson, A. and Holley, R. 2010. Social networking in academic libraries: the possibilities and the concerns. *New Library World* 111(11/12): 468–479.
- Dong, E. 2008. Using blogs for knowledge management in libraries. *CALA Occasional Paper Series* 2:1–7.
- Drew, CJ., Hardman, ML. and Hosp, J. 2008. *Designing and conducting research in education*. Los Angeles: Sage Publications.
- Drucker, P. 1993. *Post-capitalist society*. Oxford: Butterworth.
- Drucker, P. 1998. The coming of the new organisation. In *Havard Business review on Knowledge Management*. London: Havard Business School Press:1–19.
- Du, R., Ai, S. and Ren, Y. 2007. Relationship between knowledge sharing and performance: A survey in China. *Expert Systems with Applications* 32: 38–46.
- Dulle, F. 2010. An analysis of open access scholarly communication in Tanzanian public universities. PhD Thesis. University of South Africa. South Africa.
- Ellis, P. 2013. *Understanding research for nursing students*. 2<sup>nd</sup>ed. Los Angeles: Sage.
- Emmanuel, G. and Sife, A. 2008. Challenges of managing ICT for education: experiences from Sokoine National Agricultural Library (SNAL). *International Journal of Education and Development using Information and Communication Technology* 4(3): 137–142.
- Erwee, R., Skadiang, B. and Roxas, B. 2012. Knowledge management culture, strategy and process in Malaysian firms. *Knowledge Management Research and Practice* 10(1): 89–98.
- Facebook., 2011. Like feature on Facebook. Available: [www.facebook.com/](http://www.facebook.com/) (Accessed 14 January 2016) .
- Fan, B. 2005. Unscramble professionalism and core capability. *Library Journal* 12(12).
- Farkas, M. 2007. *Social software in libraries: Building collaboration, communication and community online*. Newark, NJ: Information Today.
- Feather J. and Sturges, P. 2003. *International encyclopedia of information and library science*. 2<sup>nd</sup> ed. London: Rutledge.
- Feilzer, MY. 2010. Doing mixed methods research pragmatically: implications for rediscovery of pragmatism as a research paradigm. *Journal of Mixed Research* 4(1): 6-16.
- Fernandez-Villavicencio, NG. 2010. Helping students become literate in a digital, networking-based society: A literature review and discussion. *International Information and Library Review* 42(2): 124–136.
- Firestone, JM. and McElroy, MW. 2003. Origin of the knowledge life cycle. Available: <http://www.sciencedirect.com/science/article/pii/B9780750676557500067> (Accessed 3 November

- 2014).
- Fisher, A. and Foreit, J. 2002. Designing a study, identifying, defining and justifying the research problem. Available: [www.popcouncil.org/Horizons/ORToolkit/toolkit/orhandbook/ch2\\_identifying.pdf](http://www.popcouncil.org/Horizons/ORToolkit/toolkit/orhandbook/ch2_identifying.pdf) (Accessed 22 January 2015).
- Fitzgerald, G. and Russo, N. 2005. The turnaround of the London ambulance service computer-aided dispatch system (LASCAD). *European Journal of Information Systems* 14(3): 244–257.
- Flick, U. 2011. *Introducing research methodology: a beginner's guide to doing a research project*. Los Angeles: Sage.
- Fontana, A. and Frey, J. 2005. The interview: from neutral stance to political involvement. In *The sage handbook of qualitative research*, edited by Y. Denzin and NK Lincoln. Thousands Oaks, CA: Sage: 695–728.
- Foo, S. and Ng, J. 2008. Library 2.0, libraries and library school. In *Proceeding of the Library Association of Singapore Conference 2008, Singapore, May 8-9*. Available: [http://www3.ntu.edu.sg/home/sfoo/publications/2008/2008LAS-SF-JN\\_fmt.pdf](http://www3.ntu.edu.sg/home/sfoo/publications/2008/2008LAS-SF-JN_fmt.pdf) (Accessed 08 April 2014).
- Foo, SC., Majid, AS. and Logan, E. 2002. Academic libraries in transition: challenges ahead. Paper presented at the Academic Library Seminar from 22<sup>nd</sup> to 26<sup>th</sup> April, 2002. Singapore.
- Ford, DP. and Chan, YE. 2003. Knowledge sharing in a multi-cultural setting: a case study. *Knowledge Management Research and Practice* 1(1): 11–27.
- Fornell, C. and Larcker, D. 1981. Evaluating structural equation models with unobservable and measurement error. *Journal of Marketing Research* 18(1): 39–50.
- Foss, NJ., Minbaeva, DB., Pedersen, T. and Reinbolt, M. 2009. Encouraging knowledge sharing among employees: how job design matters. *Human Resource management* 48(6): 871–893.
- Fowler, JF. 2014. *Survey research methods*. 5<sup>th</sup> ed. Los Angeles: Sage.
- Franklin, T. and Van Harmelen, M. 2007. Web 2.0 for content for learning and teaching in higher education. Bristol: JISC. Available: <http://www.jisc.ac.uk/media/documents/programmes/digitalrepositories/web2-contentlearning-and-teaching.pdf/> (Accessed 28 April 2015).
- Fraser, K. 2014. Defeating the “Paradigm Wars” in accounting: A mixed methods approach is needed in the education of PhD scholars. *International Journal of Multiple Research Approaches* 8(1): 49–62.
- Gaffoor, S. and Cloete, F. 2010. Knowledge Management in local Government: the case of Stellenbosch Municipality. *South African Journal of Information Management* 12(1): 1–2.
- Galesic, M. and Bosnjak, M. 2009. Indicators of response quality in a web survey. *Public Opinion*



- Quarterly* 73(2): 349–360.
- Gambles, B. and Schuster, H. 2003. The Changing image of Birmingham libraries: marketing strategy into action. *New Library World* 104(1192): 361–371.
- Gandhi, S. 2004. Knowledge management and reference services. *The Journal of Academic Librarianship* 30(5): 368–381.
- Garaba F. 2010. *An investigation into the management of the records and archives of former liberation movements in east and southern Africa held by national and private archival institutions*. D.Phil. Thesis. University of Kwazulu Natal: Pietermaritzburg.
- Gatian, A. 1994. Is user satisfaction a valid measure of system effectiveness? *Information and Management* 26(3): 119–131.
- Gayton, J. 2008. Academic libraries. *The Journal of Academic Librarianship* 34(1): 60–66.
- Gill, T. 1995. Early expert systems: where are they now?. *MIS Quarterly* 19(1): 51–81.
- Glassop, L. 2002. The organizational benefits of teams. *Human Relations* 55(2): 225–250.
- Glesne, C. and Peshkin, P. 1992. *Becoming qualitative researches: an introduction*. New York, NY: Longman.
- Gloet, M. and Terziovski, M. 2004. Exploring the relationship between knowledge management practices and innovation performance. *Journal of Manufacturing Technology Management* 15(5): 402–409.
- Godwin, P. 2007. Information literacy meets Web 2.0: how the new tools affect our teaching and our training. *New Review of Information Networking* 13(2): 101–112.
- Gold, AH., Malhotra, A. and Segars, H. 2001. Knowledge management: an organizational capabilities perspective. *Journal of Management Information Systems* 18(1): 185–214.
- Goodwin, LD. and Goodwin, W. 1984. Qualitative vs quantitative research? *Nursing Research* 33(6): 378–380.
- Gorman, M. 2000. *Our enduring values: librarianship in the 21<sup>st</sup> centuries.*, New Jersey: Harper and Row.
- Gottschalk, P. 2005. *Strategic knowledge management technology*. Hershey: PA: IDEA Group Publishing.
- Grace, TPL. 2009. Wikis as a knowledge management tool. *Journal of Knowledge Management* 13(4): 64–74.
- Gray, K., Thompson, C., Clerehan, R. Sheard, R. and Hamilton, M. 2008. Web 2.0 authorship: issues of referencing and citation for academic integrity. *Internet and Higher Education* 11: 112–118.
- Gray, D. 2004. *Doing research in the real world*. London: Sage Publications.
- Gray, P. 2000. The effects of knowledge management systems on emergent teams: towards a research model. *Journal of Strategic Information Systems* 9: 175–191.

- Grosbeck, G. 2009. To use or not to use Web 2.0 in higher education? *Social and Behavioral Science* 1(1): 478–482.
- Grover, V. and Drucker, T. 2001. General perspectives on knowledge management: fostering a research agenda. *Journal of Management Information System* 18(1): 5–21.
- Gu, C. and Widen-Wulff, G. 2011. Scholarly communication and possible changes in the context of social media: a Finnish case study. *Electronic Library, The* 26(6): 762–776.
- Guba, EG. and Lincoln, Y. 1989. *Fourth generation evaluation*. Newbury Park, CA: Sage.
- Guba, EG. and Lincoln, Y. 1988. The countenances of fourth generation evaluation: description, judgement and negotiation. *Evaluation Studies Review Annual* 11: 70–78.
- Guetzkow J. and Lamont M. 2004. What is originality in the humanities and social sciences? *American Sociological Review* 69(April): 190-212.
- Guimaraes, T. and Igbaria, M. 1997. Client/server system success: exploring the human side. *Decision Sciences* 28(4): 851–876.
- Gupta, A. and Govindarajan, V. 2000. Knowledge management social dimension: lessons from Nucor Steel. *Sloan Management Review* 42(1): 71–80.
- Gupta, K. 2008. A comparative analysis of knowledge sharing climate. *Knowledge and Process Management* 15(3): 186–195.
- Gurteen, D. 1998. Knowledge, creativity and innovation. *Journal of Knowledge Management* 2(1): 5–13.
- Guru, BPMC., Gopalswamy, M., Arun, J. and Padmamma, S. 2009. Academic library management in India: challenges and opportunities. Available: [http://crl.du.ac.in/ical09/papers/index\\_files/ical-74\\_245\\_695\\_1\\_RV.pdf](http://crl.du.ac.in/ical09/papers/index_files/ical-74_245_695_1_RV.pdf) (Accessed 06 August 2014).
- Habib, M. 2006. *Towards academic Library 2.0: development and application of a library methodology*. North Carolina: University of North Carolina at Chapel Hill.
- Hair, J., Black, W., Babin, B., Anderson, R. and Tatham, R. 2010. *Multivariate data analysis*. 7<sup>th</sup> ed. New Jersey: Pearson Prentice Hall.
- Halawi LA, McCarthy, RV. and Aronson, JE. 2007. An empirical investigation of knowledge-management systems' success. *The Journal of Computer Information Systems* 48(2):121–135.
- Han, Z. and Liu, YQ. 2010. Web 2.0 applications in top Chinese university libraries. *Library Hi Tech* 28(1): 41–62.
- Hansen, MT, Nohria, N. and Tierney, T. 1999. What's your strategy for managing knowledge? *Havard Business Review* 77(2): 106–116.
- Harinarayana, NS. and Vasantha Raju, N. 2010. Web 2.0 features in university library web sites. *The Electronic Library* 28(1): 69–88.
- Harlow, L. 2006. Basic multivariate themes and methods. ICOTS-7. Available:

- [http://www.ime.usp.br/~abe/ICOTS7/Proceedings/PDFs/InvitedPapers/3E3\\_HARL.pdf](http://www.ime.usp.br/~abe/ICOTS7/Proceedings/PDFs/InvitedPapers/3E3_HARL.pdf) (Accessed 22 April 2015).
- Hasanali, F. 2002. Critical success factors of knowledge management. Available: [www.providersedge.com/docs/km\\_articles/Critical\\_Success\\_Factors\\_of\\_KM.pdf](http://www.providersedge.com/docs/km_articles/Critical_Success_Factors_of_KM.pdf) (Accessed 08 September 2015).
- Hawamdeh, S. and Foo, S. 2001. Information professionals in the information age: vital skills and competencies. Paper presented at the *International Conference for Library and Information Science Educaors in the Asia Pacific Region (ICLISE)*, Kuala Lumpur, Malaysia, June 11-12, 2001.
- Hawkins, B. 2000. Libraries, knowledge management and higher education in an electronic environment. In *Proceedings of the American Library and Information Association Conference*, Chicago, Illinois, 2000.
- Hayes, H. 2004. The role of libraries in the knowledge economy. *Serials* 17(3): 231–238.
- Hazidah, NA. and Mohd Ismail, A. 2013. Web 2 . 0 on academic libraries in Southern Asia. Paper presented at the IATUL Conferences. Also Available: Available: <http://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=1960&context=iatul> (accessed 14<sup>th</sup> July 2016).
- Hazlett, SA., McAdam, R. and Gallagher, S. 2005. Theory building in knowledge management: in search of paradigms. *Journal of Management Inquiry* 14(1): 31–42.
- Hedges, L. 2009. Multivariate statistical methods. Available: Available: Available: <http://www.facultyprogrammes.org/documents/Multivariatestatisticalmethods.pdf> (Accessed 21 April 2015).
- Hendriks, P. 1999. Why share knowledge? The influence of ICT on the motivation for knowledge sharing. *Knowledge and Process Management* 6(2): 91–100.
- Henley, M. 2012. Realizing the potential of ICTs in Tanzania: policy briefing, PANOS London Illuminating Voices. [http://panos.org.uk/wp-content/files/2011/01/panos-london-ICTs\\_and\\_tanzania-policy.pdf](http://panos.org.uk/wp-content/files/2011/01/panos-london-ICTs_and_tanzania-policy.pdf) (Accessed 03 March 2014).
- Herkema, S. 2003. A complex adaptive perspective on learning within innovation projects. *The Learning Organization* 10(6): 340–346.
- Hernon, P. and Schwartz, C. 2007. What is a problem statement? *Library and Information Science Research* 29: 307–309.
- Hernon, P. 2001. Components of the research process: where do we need to focus attention? *Journal of Academic Librarianship* 27(2): 81-89.
- Hideo, S. and Shinichi, K. 2007. KM2 . 0 : Business knowledge sharing in the Web 2 . 0 age. *Nec Technical Journal* 2(2): 50–54.

- Hislop, D. 2013. *Knowledge management in organizations: a critical introduction* 3<sup>rd</sup> ed. Oxford: Oxford University Press.
- Hofstede, G. 1980. *Cultures consequences: International differences in Work-related Values*. Beverly Hills: Sage Publications.
- Holt, DT., Bartczak, SE., Clark, SW. and Trent, MR. 2007. The development of an instrument to measure readiness for knowledge management. *Knowledge Management Research and Practice* 5(2): pp.75–92.
- Hong, W., Thong, JYL., Wong, W. and Tam, KY. 2001. Determinants of user acceptance of digital libraries: an empirical examination of individual differences and system characteristics. *Journal of Management Information Systems* 18(3): 97–124.
- Hosseini, E. and Hashempour, L. 2012. The status of librarians' knowledge sharing by the usage of Web 2.0 tools: a case study of central libraries of Tabriz governmental universities. *E-Science and Information Communications in Computer and Information Science* 371:128–137.
- Hosseini, S. 2011. The application of SECI model as framework of knowledge creation in virtual learning: a case of IUST virtual classes. *Asia Pacific Education Review* 12: 263–270.
- Hsieh, JJPA. and Wang, W. 2007. Explaining employees' extended use of complex information systems. *European Journal of Information Systems* 16(3): 216–227.
- Hsu, CL. and Lin, JCC. 2008. Acceptance of blog usage: The roles of technology acceptance, social influence and knowledge sharing motivation. *Information and Management* 45(1): 65–74.
- Huang, Q., Davison, RM. and Gu, J. 2008. Impact of personal and cultural factors on knowledge sharing in China. *Asia Pacific Journal of Management* 25: 451–471.
- Hughes, D. 1996. NHS managers as Rhetoricians: a case of culture management?. *Sociology of Health and Illness* 18(3): 291–314.
- Hussein, A. 2009. The use of triangulation in social science research: can qualitative and quantitative methods be combined? *Journal of Comparative Social Work* 1: 1–12.
- Ichijo, K., Krough, G. and Nonaka, I. 1998. Knowledge enablers . In *Knowing in firms*, edited by J. Krogh and G. Roos. London: Sage: 173–203.
- IFLA. 2016. IFLA Knowledge Management Section Action Plan 2014-2016. Available: <http://www.ifla.org/files/assets/km/strategic-plan/Files/2014-2016.pdf> (Accessed 7 August 2016).
- Irick, L. 2007. Managing tacit knowledge in organizations. *Journal of Knowledge Management Practice* 8(3): 1–6.
- Islam, MA., Agarwal, NK. and Ikeda, M. 2014. Library adoption of knowledge management using Web 2.0: A new paradigm for libraries. *International Federation of Library Association and Institutions* 40(4): 317–330.

- Israel, G. 2010. Information explosion and university libraries: current trends and strategies for intervention. *Chinese Librarianship. An International Electronic Journal* 30: 1–15.
- IUCEA. 2005. Inter University Council of East Africa (IUCEA). Inter University Council of East Africa report 2005. Unpublished report. Kampala: IUCEA.
- Jain, P. and Nfila, R. 2006. Information management or knowledge management: practices or initiatives in academic libraries in Africa. Paper presented at the *XVII Standing Conference of Eastern, Central and Southern Africa Library and Information Association*, Dar-es-Salaam, 10<sup>th</sup>–14<sup>th</sup> July 2006: 178–195.
- Jain, P. 2007. An empirical study of knowledge management in academic libraries in East and Southern Africa. *Library Review* 56(5): 377–392.
- Jain, P. 2012. An empirical study of knowledge management in university libraries in SADC countries. New research on knowledge management applications and lesson learned. Available: <http://www.intechopen.com/books/new-research-on-knowledge-management-applications-and-lesson-learned/> (Accessed 15 July 2014).
- Jain, P. 2015. Knowledge management, leadership and decision making: A case of academic libraries. Paper presented at the *81<sup>st</sup> International Federation of Library Associations and Institutions (IFLA) - World Library and Information Conference*, Cape Town, South Africa, 15–21 August 2015.
- Jain, P. 2009. Knowledge management for 21<sup>st</sup> century information professionals. *Journal of Knowledge Management Practice* 10(2): 1–11.
- Jain, P. 2013. Knowledge management in academic libraries and information centres: A case of university libraries. *Journal of Information and Knowledge Management* 12(4): 1–13.
- Jain, P. 2014. Knowledge management in academic libraries in developing countries: a case of Southern Africa. *AFFRIKA: Journal of Politics, Economics and Society* 4(1/2): 7–37.
- Jain, P. 2011. Personal knowledge management: the foundation of organisational knowledge management. *South African Journal of Libraries and Information Science* 77(1):1–14.
- Jantz, R. 2001. Knowledge management in academic libraries: special tools and processes to support information professionals. *Reference Services Review* 29(1): 33–39.
- Jarvenpaa, SL. and Staples, D. 2000. The use of collaborative electronic media for information sharing: an exploratory study of determinants. *Strategic Information Systems* 9(2/3): 129–154.
- Jashapara, A. 2005. The emerging discourse of knowledge management: a new dawn for information science research? *Journal of Information Science* 31(2): 136–148.
- Jena, P. and Khuntia, D. 2008. Library 2.0 catalyst for library users. Paper presented at the *6<sup>th</sup> Convention PLANNER*, Nagaland University, Nagaland, 6–7 November 2008.
- Jennex, M. and Olfman, L. 2003. A knowledge management success model: An extension of Delone and

- McLean's success model. Paper presented at the *Americas Conference on Information Systems (AMCIS 03)*, Tampa, Florida.
- Jennex, ME. and Olfman, L. 2000. Development recommendations for knowledge management/organizational memory systems. In *Proceeding of the Information Systems Development Conference*.
- Jennex, M., Smolnik, S. and Croasdell, D. 2007. Towards Defining Knowledge Management Success. Paper presented at the *40<sup>th</sup> Annual Hawaii International Conference on System Sciences (HICSS'07)*: 1–8.
- Jennex, ME. 2011. Knowledge management success models. In *Encyclopedia of knowledge management* edited by D. Schwartz and D. Teeni. 2<sup>nd</sup> ed. Hershey, PA: Information Science Reference: 763–771.
- Jennex, ME. and Olfman, L. 2008. A Model of Knowledge Management Success. Available: [http://163.26.133.1/classv2/UploadDocument/961\\_R10\\_Success\\_IJKM\\_2005.pdf](http://163.26.133.1/classv2/UploadDocument/961_R10_Success_IJKM_2005.pdf) (Accessed 6 July 2015).
- Jennex, ME. and Olfman, L. 2004. Assessing Knowledge Management Success / Effectiveness Models. Paper presented in the Proceedings of the 37th Hawaii International Conference on System Sciences: 1–10.
- Jennex, ME. and Zyngier, S. 2007. Security as a contributor to knowledge management success. *Information Systems Frontiers* 9(5): 493–504.
- Johnson, B. and Turner, L. 2003. Data collection strategies in mixed methods research. In *Handbook of mixed methods in social and behavioural research*, edited by C. Tashakkori and A. Teddlie. Thousands Oaks, CA: Sage Publications.
- Johnson, R., Onwuegbuzie, A. and Turner, L. 2007. Toward a definition of mixed methods research. *Journal of Mixed Methods Research* 1(2): 112–133.
- Jones, MC., Cline, M. and Ryan, S. 2006. Exploring knowledge sharing in ERP implementation: an organisational culture framework. *Decision Support Systems* 41: 411–434.
- Kaane, S. 2009. Knowledge management in libraries: an introduction. Available: <http://www.slideshare.net/unulwbpartnership/km-un-university-librarians-3-sept-2009?related=1> (Accessed 15 May 2015).
- Kakabadse, NK., Kakabadse, A. and Kouzmin, A. 2003. Reviewing the knowledge management literature: towards a taxonomy. *Journal of Knowledge Management* 7(4): 75–91.
- Kane, GC. and Fichman, RG. 2009. The shoemaker's children: using Wikis for information systems teaching, research, and publication. *MIS Quarterly* 33 (1): 1–22.
- Kaniki, A. 2006. Doing an information search. In *Research in practice: applied methods for social sciences* edited by MT. Blanche, K. Durrheim, and D. Painter. Cape Town: University of Cape

- Town Press: 19 – 32.
- Kari, J. 2009. Informational uses of spiritual information: an analysis of messages reportedly transmitted by extra physical means. *Journal of Information Science* 35(4): 453–468.
- Karim, NSA., Razi, MJM. and Mohamed, N. 2012. Measuring employee readiness for knowledge management using intention to be involved with KM SECI processes. *Business Process Management Journal* 18(5):777–791.
- Karlinsky, Y. and Zviran, M. 2012. Factors influencing perceived benefits and user satisfaction in knowledge management systems. In *Working paper No. 8/2012. Research No. 07020200*. Available:[https://en-coller.tau.ac.il/sites/nihul\\_en.tau.ac.il/files/WP\\_8-2012-Karlinsky\\_Zviran.pdf](https://en-coller.tau.ac.il/sites/nihul_en.tau.ac.il/files/WP_8-2012-Karlinsky_Zviran.pdf) (Accessed 08 January 2016).
- Kebede, G. 2010. Knowledge management: An information science perspective. *International Journal of Information Management* 30(5): 416–424.
- Kelle, U. 2006. Combining qualitative and quantitative methods in research practice: purposes and advantages. *Qualitative Research in Psychology* 3(4): 293–311.
- Kemoni, H. 2007. Records management practices and public service delivery in Kenya. PhD Thesis. University of KwaZulu-Natal, Pietermaritzburg, South Africa.
- Kettinger, WJ. and Lee, C. 1994. Perceived service quality and user satisfaction with the information services function. *Decision Sciences* 25(5):737–766.
- Kidwell, JJ., Vande Linde, KM. and Johnson, S. 2000. Applying corporate knowledge management practices in higher education. *Educause Quarterly* 4: 28–33.
- Kifer, R. 2005. Our libraries: the second hundred years, a vision. *Virginia Libraries* 51(3):3–4.
- Kim, S and Lee, H. 2005. Employee knowledge sharing capabilities in public & private organizations: Does organizational context matter? Paper presented on the 38th Annual Hawaii International Conference on System Sciences on April 22, 2011. Available: <http://csdl2.computer.org/comp/proceedings/hicss/2005/2268/08/22680249a.pdf/> (Accessed 02 September 2015).
- Kim, S. and Lee, H. 2006. The impact of organizational context and information technology on employee knowledge sharing capabilities. *Public Administration Review* 66(3): 370–385.
- Kim, Y. and Abbas, J. 2010. Adoption of Library 2 . 0 functionalities by academic libraries and users : A knowledge management perspective. *The Journal of Academic Librarianship* 36(3): 211–218.
- Kim, S. 1999. The roles of knowledge professionals for knowledge management. Paper Presented on the 65th IFLA Council General Conference, Bangkok, Thailand, August 20-28. Available: <http://www.ifla.org/IV/ifla65/papers/042-115e.htm> (Accessed 03 April 2015).
- Kim J., Lee J., Han K. and Lee, M. 2002. Business as buildings: metrics for the architectural quality of

- internet businesses. Research. *Information Systems* 13(3): 239–254.
- King, WR. and Marks, P. 2008. Motivating knowledge sharing through a knowledge management system. *Omega* 36:131–146.
- King, WR. 2011. Knowledge transfer. In *Encyclopedia of knowledge management*. 2<sup>nd</sup> ed. edited by D. Schwartz and D. teeni. Hershey, PA: Information Science Reference: 967-976.
- Klein, R. 2007. An empirical examination of patient-physician portal acceptance. *European Journal of Information Systems* 16(6): 751–760.
- Knoco, 2014. Knowledge management policies and procedures. Available: [http://www.knoco.com/html/knowledge\\_management/](http://www.knoco.com/html/knowledge_management/) (Accessed 10 May 2014).
- Koenig, M. 1998. From intellectual capital to knowledge management: what are they talking about? *Inspel* 32(4): 222–233.
- Koenig, M. 1996. Intellectual capital and knowledge management. *IFLA Journal* 22(4): 299–301.
- Koenig, M. 2003. Knowledge management, user education and librarianship. *Library Review* 52(1): 10–17.
- Koina, C. 2003. Librarians are the ultimate knowledge managers. *Australian Library Journal* 52(3): 269–272.
- Kombo, DK. and Tromp, D. 2006. *Proposal and thesis writing: an introduction*. Nairobi: Paulines Publications.
- Koskinen, K. and Vanharanta, H. 2002. The role of tacit knowledge in innovation processes of small technology companies. *International Journal of Production Economics* 80: 57–64.
- Kosonen, M. and Kianto, A. 2009. Applying wikis to managing knowledge: a socio-technical approach. *Knowledge and Process Management* 16(1): 23-29.
- Kothari, C. 2004. *Research methodology: methods and techniques*. 2<sup>nd</sup> ed. New Delhi: New Age International.
- KPCB. 2015. Internet Trends 2015. Available: <http://www.kpcb.com/blog/2015-internet-trends> (Accessed 7 July 2016).
- Kripanont, N. 2007. Using technology acceptance model of Internet usage by academics within Thai Business Schools. Unpublished PhD Thesis, Victoria University.
- Krishnamurthy, V. and Balasubramani, R. 2012. Awareness of knowledge management among librarians of engineering colleges affiliated to Anna University of Technology, Coimbatore: a study. *Journal of Advances in Library and Information Science* 1(2): 84–87.
- Kude, N., Nalhe, UO. and Mankar, S. 2012. Knowledge management practice in academic libraries. *International Journal of Research in management, Economics and Commerce* 2(11): 225–234.
- Kuhlen, R. 2003. Change of paradigm in knowledge management: framework for the collaborative



- production and exchange of knowledge. Paper presented at 69<sup>th</sup> *International Federation of Library Associations and Institutions (IFLA) - World Library and Information Conference and Council*, Berlin, 1-9 August 2003.
- Kuhn, T. 1970. *The structure of scientific revolutions*. Chicago: University of Chicago.
- Kulkarni, UR., Ravindran, S. and Freeze, R. 2006. A KMS model: technical development and empirical validation. *Journal of Management Information System* 23(3): 309–347.
- Kumar, M. 2009. Academic libraries in electronic environment: paradigm shift. Available: [http://crl.du.ac.in/ical09/papers/index\\_files/ical-16\\_182\\_384\\_3\\_RV.pdf](http://crl.du.ac.in/ical09/papers/index_files/ical-16_182_384_3_RV.pdf) (Accessed 04 April 2014).
- Kumar, R. 2005. *Research methodology: a step-by-step guide for beginners*. 2<sup>nd</sup> ed. London: Sage Publications.
- Kwanya, T., Stilwell, C. and Underwood, P. 2012. The application Of Web 2 . 0 tools by libraries. Paper presented at the SCECSAL XXth Conference hosted by KLA on 4 th to 8th. Kenya.
- Labor, USD. 2009. Occupational outlook handbook. Available: <http://www.bls.gov/oco/ocos068.htm> (Accessed 04 August 2015).
- Lamshed, R., Berry, M. and Armstrong, L. 2002. *Blogs: personal e-learning spaces*. Melbourne, Australia: TAFE Frontiers. Also Available: <http://www.binaryblue.com.au/docs/blogs.pdf/> (Accessed 25<sup>th</sup> August 2015).
- Lankes, R. 2008. Virtual reference to participatory librarianship: expanding the conversation. Available: <http://www.asis.org/Bulletin/Dec-07/lankes.html/> (Accessed 19 February 2015).
- Lankshear, C. and Knobel, M. 2004. *A handbook for teacher research: from design to implementation.*, Berkshire: Open University Press.
- LASSIE. 2008. Libraries and social software in education (LASSIE). Available: <http://clt.lse.ac.uk/Projects/LASSIE.php> (Accessed 09 March 2016).
- Lee, H. and Choi, B. 2003. Knowledge management enablers, processes, and organizational performance: an Integrative view and empirical examination. *Journal of Management Information Systems* 20(1): 179–228.
- Lee, YC. and Lee, S. 2007. Capabilities, processes and performance of knowledge management: a structural approach. *Human Factors and Ergonomic in Manufacturing* 17(1): 21–41.
- Lee, H. 2005. Knowledge management and the role of libraries. *Chinese Librarianship: an International Electronic Journal* 19.
- Lee, H. 2000. The role of libraries in knowledge management. Available: [http://szlibszptt.net.cn/download/km\\_n\\_lib.ppt](http://szlibszptt.net.cn/download/km_n_lib.ppt) (Accessed 02 January 2016).
- Leedy, PD. and Ormrod, J. 2010. *Practical research: planning and design.*, Upper Saddle River, NJ: Pearson.

- Leedy, PD. and Ormrod, J. 2001. *Practical research: planning and design*. 7<sup>th</sup> ed. London: Prentice Hall.
- Leedy, PD. and Ormrod, J. 2005. *Practical research: planning and design*. Upper Saddle River, NJ: Pearson.
- Leonard-Barton, D. 1995. *Wellsprings of knowledge: building and sustaining the sources of innovation*. Boston: Harvard Business School Press.
- Leshem, S. and Trafford, V. 2007. Overlooking the conceptual framework. *Education and Teaching International* 44(1): 93–105.
- Levy, M. 2009. Web 2.0 implications on knowledge management. *Journal of Knowledge Management* 13(1): 120–134.
- Li, Z. and Zhu, T. 2009. Empirical study on the influence of social capital to informal knowledge transfer among individuals. *Journal of Software* 4(4): 291–298.
- Lin, H. 2007. Knowledge sharing and firm innovation capability: an empirical study. *International Journal of Manpower* 28(3/4): 315–332.
- Lin, H. 2011. The effects of employee motivation, social interaction, and knowledge management strategy on knowledge management implementation level. *Knowledge Management Research and Practice* 9: 263–275.
- Lin, C., Hung, HC. and Wu, JY. 2002. A knowledge management architecture in collaborative supply chain. *The Journal of Computer Information Systems* 42(5): 83-94.
- Lin, K. 2007. Building Web 2.0. *Computer* 5(40): pp.101–102. Also available: <https://www.computer.org/csdl/mags/co/2007/05/r5101-abs.html> (Accessed 14 May 2015).
- Lincoln, YS. and Guba, E. 2000. Paradigmatic controversies, contradictions, and emerging confluences. In *Handbook of Qualitative Research* edited by N.K. Denzin and Y.S. Lincoln London: Sage: 163 – 188.
- Lincoln, S. 2009. *Mastering Web 2.0: transform your business using key website and social media tools*. Philadelphia: Kogan Page.
- Linh, N. 2008. A survey of the application of web 2.0 in Australasian University libraries. *Library Hi Tech* 26(4): 630–653.
- Liu, S. 2008. Engaging Users: The Future of Academic Library Web Sites. *College and Research Libraries* 69(1): 6–27.
- Livari, J. 2005. An empirical test of the DeLone-McLean model of information system success. *ACM SIGMIS Database* 36(2): 8–27.
- Lloria, M. 2008. A review of the main approaches to knowledge management. *Knowledge Management Research and Practice* 6(1): 77–89.
- De Long, DW. and Fahey, L. 2000. Diagnosing cultural barriers to knowledge management. *Academy of*

- Management Executives* 14(4): 113–127.
- Long, D. 1997. *Building the knowledge-based organizations: how culture drives knowledge behaviours. Working Paper of the Centre for Business Innovation*. Cambridge, MA.Sage.
- Lopez-Nicolas, C. and Soto-Acosta, P. 2010. Adoption and use effects on knowledge creation: an empirical investigation in SMEs. *International Journal of Information Management* 30(6): 521–528.
- Luen, TW. and Al-Hawamdeh, S. 2001. Knowledge management in the public sector: principles and practices in police work. *Journal of Information Science* 27(5): 311–318.
- Luo, L. 2010. Web 2.0 Integration in Information Literacy Instruction: An Overview. *Journal of Academic Librarianship* 36(1): 32–40.
- Luo, L. 2009. Web 2 . 0 Integration in Information Literacy Instruction : An Overview. *The Journal of Academic Librarianship* 36(1): 32–40.
- Lwehabura, M. 2007. The status and practice of information literacy for teaching and learning in four Tanzanian Universities. Unpublished PhD thesis.-Natal. University of KwaZulu Natal, South Africa.
- Lwoga, E. 2012. Making learning and Web 2.0 technologies work for higher learning institutions in Africa. *Campus-Wide Information Systems* 29(2): 90–107.
- Lwoga, E. 2013. Measuring the success of library 2.0 technologies in the African context: The suitability of the DeLone and McLean model. *Campus-Wide Information Systems* 30(4): 288–307.
- Lwoga, ET. 2014. Integrating Web 2.0 into an academic library in Tanzania. *Electronic Library, The* 32(2): 183–202.
- MacWhinnie, L. 2003. The information commons: the academic library of the future. *Portal-Libraries and the Academy* 3(2): 241–258.
- Madge, OL. 2010. Knowledge management in libraries. *Library and Information Science Research* 14: 85-98.
- Madhusudhan, M. 2010. Use of electronic resources by research scholars of Kurukshetra University. *The Electronic Library* 28(4): 492–506.
- Magnier-Watanabe, R., Benton, C. and Senoo, D. 2011. A study of knowledge management enablers across countries. *Knowledge Management Research Practice* 9: 17–28.
- Mahmood, K & Richardson, J., 2011. Impact of Web 2.0 technologies on academic libraries: a survey of ARL libraries. *Electronic Library, The* 45(4): 365–375.
- Mahmood, K. 2003. A comparison between needed competencies of academic librarians and LIS curricula in Pakistan. *The Electronic Library* 21(2): 99–109.
- Mahmood, O. 2007. Developing Web 2.0 applications for semantic web of trust. In 7<sup>th</sup> *Proceeding of the International Conference on Information Technology (ITNG)*: 819-824.
- Majchrzak, A., Wagner, C. and Yates, D. 2013. The impact of shaping on knowledge reuse for

- organizational improvement with Wikis. *MIS Quarterly* 37(2):455–469.
- Majhi, S. and Maharana, B. 2010. Innovative Web 2.0 technologies for integrating the learning process. Paper presented at the *XI MANLIBNET: Trends and Challenges in Management and Corporate Libraries in Digital Era*:8.
- Majumdar, A. and Shukla, A. 2008. Web 2.0: Implications on Library. *International CALIBER*: 462–468.
- Makori, EO. 2012. Bridging the information gap with the patrons in university libraries in Africa: The case for investments in Web 2.0 systems. *Library Review* 61(1): 30–40.
- Malhotra, Y. 2000. Knowledge management and new organization forms : A framework for business model innovation. *Information Resources Management Journal* 13(1): 5–14.
- Maness, J. 2006. Library 2.0 theory: Web 2.0 and its implications for libraries. *Weblogs* 3(2): 1–10.
- Map of Tanzania. 1997. Map of Tanzania. Available at: <http://www.infoplease.com/atlas/country/tanzania.html> (Accessed 31 January 2017).
- Maponya, P. 2004. Knowledge management practices in academic libraries: a case study of the University of Natal, Pietermaritzburg Libraries. Available at: <http://mapule276883.pbworks.com/f/knowledge+management+practices+in+academic+libraries.pdf> (Accessed 10 July 2014).
- Marble, R. 2003. A system implementation study: management commitment to project management. *Information and Management* 41(1): 111–123.
- Marga, A. 2005. *University reform today*. Cluj-Napoca: Presa Universita Clujeana.
- Marouf, L. 2005. The role of business and social ties in organizational knowledge sharing: a case study of a financial institution. Ph.D Thesis, Department of Library and Information Science, School of Information Sciences, University of Pittsburgh. Pittsburgh, USA.
- Marrison, M. 2007. Where have all the theories gone? *Philosophy of Science* 74(2): 195–228.
- Marshall, A. 1965. *Principles of economics*. London: Macmillan.
- Marshall, C. and Rossman, G. 1999. *Designing qualitative research*. 3<sup>rd</sup> ed. Thousand Oaks, CA: Sage Publications.
- Mason, J. 2002. *Qualitative researching*. 2<sup>nd</sup> ed. London: Sage.
- Masrek, MN., Jamaludin, A. and Mukhtar, S. 2010. Evaluating academic library portal effectiveness: a Malaysian case study. *Library Review* 59(3): 198–212.
- Massingham, P. 2008. Measuring the impact of knowledge loss: more than ripples on a pond? *Management Learning* 39(5): 541-560.
- Materu-Behitsa, M. and Diyamett, B. 2010. Tanzania ICT sector performance review 2009/2010, towards evidence-based ICT policy and regulation. *ResearchICT Africa* 2(11):1–47.
- Matthews , B. and Ross, L. 2010. *Research methods: a practical guide for the Social Sciences*. Harlow:

Longman.

- Mavodza, J. 2010. Knowledge Management Practices and the role of academic library in a changing information environment: the case of Metropolitan College of New York. Ph.D. Thesis. University of South Africa, South Africa.
- Mavodza, J. and Ngulube, P. 2012. Knowledge management practices at an institution of higher learning. *South African Journal of Information Management* 14(1):1-8. Also Available: <http://www.sajim.co.za/index.php/SAJIM/article/view/496> (Accessed 23 August 2015).
- McGill, T.J. and Klobas, J. 2005. The role of spreadsheet knowledge in user-developed application success. *Decision Support Systems* 39(3): 355–369.
- McGill, T., Hobbs, V. and Klobas, J. 2003. User-developed applications and information systems success: A Test of DeLone and McLean's model. *Information Resources Management Journal* 16(1): 24–45.
- McGill, T., Hobbs, V. and Klobas, J. 2003. User-developed applications and information systems success: a test of DeLone and McLean's model. *Information Resources Management Journal* 16(1): 24–45.
- Mchombu, K. 2006. Harnessing knowledge management for Africa's transition to the 21st Century. Paper presented at the *XVII Standing Conference of Eastern, Central and Southern Africa Library and Information Association*. The Library and Information Association of Tanzania, Dar-es-Salaam, 10–14 July 2006: 2–39.
- McKnight, S. 2007. A futuristic view of knowledge and information management. <http://www.whiteclouds.com/iclc/cliej/cl19lee.htm> (Accessed 11 May 2015).
- McManus, B. 2009. The implications of Web 2.0 for academic libraries. *Electronic Journal of Academic and Special Librarianship* 10(3): 1–10.
- MDG. 2011. The millennium development goals report. <http://www.un.org/millenniumgoals/pdf/%282011%20MDG%20Report%202011%20Book%20LR.pdf> (Accessed 08 June 2015).
- Mendes, L.H., Quinonez-Skinner, J. and Skaggs, D. 2009. Subjecting the catalog to tagging. *Library Hi Tech* 27(1): 30–41.
- Michael, S. and Maria, C. 2007. Web 2.0, Library 2.0, and the hyperlinked library. *Serials Review* 33: 253–256.
- Miller, R.L. and Brewer, J. 2003. *The A-Z of social research: philosophy of social research*. London: Sage.
- Miller, P. 2006. Coming together around Library 2.0: a focus for discussion and a call to arms. *D-Lib Magazine* 12 (4). Available: <http://www.dlib.org/dlib/april06/miller/04miller.html> (Accessed 26 May 2016).

- Miller, P. 2005. Web 2.0: building the new library. *Ariadne* 45. Available: [www.ariadne.ac.uk/issue45/miller/intr.html/](http://www.ariadne.ac.uk/issue45/miller/intr.html/) (Accessed 09 August 2015).
- Minishi-Majanja, M. 2004. Mapping and audit of Information and Communication Technologies in LIS education in Africa. PhD thesis. University of Zululand, South Africa.
- Mitchell, ML. and Jolley, J. 2007. Advantages of using theory to generate ideas. Research design explained. Available: [http://www.jolley-mitchell.com/Appendix/Theory\\_Appendix/Using\\_Theory.htm](http://www.jolley-mitchell.com/Appendix/Theory_Appendix/Using_Theory.htm) (Accessed 12 September 2015).
- Mládková, L. 2011. Knowledge Management for Knowledge Workers. *Electronic Journal of Knowledge Management* 9(3): 248–258.
- Mlozi, S., Jing, F. and Sedoyeka, E. 2010. Technology adoption in tourism industry: a case of wireless technology (WiMAX0 for Tanzania. Paper presented at the *International Conference on E-Business and E-Government*, 10-11 September 2010.
- Mokyr, J. 2002. *The gifts of Athena: historical origins of the knowledge economy*. New York: Oxford University Press.
- Monsour, J. and House, R. 2001. Cultural acumen for the global manager. *Organisational Dynamics* 29(4): 292–295.
- Morgan, D. 2007. Paradigms lost and pragmatism regained: methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research* 1(1): 48–76.
- Morris, SA., Marshall TE., and Rainer, R. 2002. Impact of user satisfaction and trust on virtual team members. *Information Resources Management Journal* 15(2): 22–30.
- Morris, A. 2001. Knowledge management: opportunities for LIS graduates. Paper presented at the 67<sup>th</sup> IFLA Council and General Conference from August 16<sup>th</sup> to 25<sup>th</sup> August, 2001.
- Morse, J. 2003. Principles of mixed methods and multi method research design. In *Handbook of mixed methods in social and behavioral research* edited by A. Tashakkori and C. Teddlie. Thousands Oaks, CA: Sage Publications:189–208.
- Mosha, NF., Holmner, M. and Penzhorn, C. 2015. The role of social media tools to enhance knowledge sharing among knowledge workers in higher learning institutions: a case of Nelson Mandela African Institution of Science and Technology, Arusha, Tanzania. Paper presented at the 81<sup>st</sup> *International Federation of Library Associations and Institutions (IFLA) - World Library and Information Conference*, Cape Town, South Africa, 15-21 August 2015.
- Mosoti, Z. and Masheka, B. 2010. Knowledge Management: The Case for Kenya. *The Journal of Language, Technology and Entrepreneurship in Africa* 2(1):107–133.
- Mostofa, SM. and Mezbah-ul-islam, M. 2015. Challenges and opportunities of knowledge management in university library : A case Study of Dhaka University Library in Bangladesh. *Journal of Information*

- Science Theory and Practice* 3(4): 49–61.
- Moulaison, HL. and Corrado, EM. 2011. Staying free from ‘corporate marketing machines’ library policy for Web 2.0 tools. In *Marketing libraries in a Web 2.0 world*, edited by D. Gupta and R. Savard. Berlin: De Gruyter Saur: 43-55.
- Msolla, P. 2006. Issues of higher education in Tanzania. [http://siteresources.worldbank.org/INTWBISFP/Resources/0\\_Prof\\_Msolla.pdf](http://siteresources.worldbank.org/INTWBISFP/Resources/0_Prof_Msolla.pdf) (Accessed 6 May 2015).
- Mtega, WP., Dulle, FW., Malekani, AW. and Chailla, AM. 2014. Awareness and use of web 2.0 technologies in sharing of agricultural knowledge in Tanzania. *Knowledge Management and E-Learning* 6(2):188-202.
- MU. 2009. Mzumbe University (MU). Introduction to Mzumbe University. <http://www.mzumbe.ac.tz/intro.html/> (Accessed 24 September 2014).
- MUHAS. 2007. Muhimbili University of Health and Allied Sciences (MUHAS). Prospectus. Unpublished document. Dar-es-Salaam. Muhimbili University of Health and Allied Sciences., Dar-es-Salaam. Tanzania.
- Munatsi, R. 2010. Implementation of library 2.0 services in African academic and research libraries: need for “fundamental rethink”. Paper presented at the *19<sup>th</sup> Standing of Conference of Eastern, Central, Southern Africa Library and Information Associations (SCESSAL)*, University of Botswana, Gaborone, 6-9 December 2010.
- Muneja, PS. and Abungu, AK. 2012. Application of Web 2.0 tools in Delivering Library Services: A case of selected libraries in Tanzania. Paper presented at SCECSAL XXth Conference hosted by KLA at LAICO REGENCY HoTEL Nairobi, Kenya. 4<sup>th</sup> to 8<sup>th</sup> June 2012.
- Murphy, D. 2010. Using Web 2.0 tools to facilitate knowledge transfer in complex organisational environments: a primer. Paper presented at the *ICOMS Asset Management Conference*, University of Adelaide, South Australia.
- Murugesan, S. 2007. Understanding Web 2.0. *IT Pro*: 34–41.
- Musoke, M. 2008. Strategies for addressing the university library users’ changing needs and practices in Sub-Saharan Africa. *The Journal of Academic Librarianship* 34(6): 532–538.
- Mustaq, R. and Bokhari, R. 2011. Knowledge sharing: organizational culture and transformational leadership. *Journal of Knowledge Management* 12(2): 1–8.
- Mwakaje, A. 2010. Information and communication technology for rural farmers market access in Tanzania. *Journal of Information Technology Impact* 10(2): 111–128.
- Mwanje, J. 2001. Issues in social science research. Social science research methodology series, module 1. [Unpublished]. Addis Ababa: Organisation for Social science Research in Eastern and Southern

Africa.

- Myers, M. 1997. Qualitative research in information systems. *Management Information System Quarterly* 21(2): 241–242.
- Nawe, J. 2003. Policy and planning issues in academic libraries in Tanzania. *Library Management* 24(8/9): 417–422.
- Nazim, M. and Mukherjee, B. 2011. Implementing knowledge management in Indian academic libraries. *Journal of Knowledge Management Practice* 12(3): 1–14.
- NBS. 2015. Tanzania national bureau of statistics. Available: <http://www.nbs.go.tz/http://www.nbs.go.tz/> (Accessed 4 January 2016).
- Ndunguru, P. 2007. *Lectures on research methodology for social sciences*. Morogoro. Mzumbe University.
- Negash, S., Ryan, T. and Igbaria, M. 2003. Quality and effectiveness in Web-based customer support systems. *Information and Management* 40(8): 757–768.
- Nelson, E. 2008. Knowledge Management for Libraries. *Library Administration and Management* 22(3):135–137.
- Neuman, W. 2014. *Social research methods: qualitative and quantitative approaches*. 7<sup>th</sup> ed. Harlow: Pearson.
- Neuman, W. 2011. *Social research methods: qualitative and quantitative approaches*. Boston: Allyn and Bacon.
- Newell, S., Robertson, M., Scarbrough, H. and Swan, J.,2002. *Managing knowledge work*. Basingstoke, Hampshire: Palgrave.
- Newman, J. 2000. Action research: a brief overview. *Qualitative Social Research* 1(1).
- Newman, WL. 2006. *Social research methods: qualitative and quantitative approaches*. 6<sup>th</sup> ed. Boston: Pearson.
- Ngulube, P., Mathipa, ER. and Gumbo, M. 2014. Theoretical and conceptual frameworks in social research. In *Addressing research challenges: making headway for the developing researchers* edited by M. Mathipa and ER. Gumbo. Noordwyk: Mosala-Masepi Publishers: 47-69.
- Ngulube, P. and Lwoga, E. 2007. Knowledge management models and their utility to the effective management and integration of indigenous knowledge with other knowledge systems. *Systems. Indilinga - African Journal of Indigenous Knowledge* 6(2): 117–131.
- Ngulube, P. 2012. Blending qualitative and quantitative research methods in library and information science in Sub-Saharan Africa. *Journal of Eastern and Southern Africa Regional Branch of the International Council on Archives* 32: 10–23.
- Ngulube, P. 2009. *Research methods in information science*. Pretoria: University of South Africa.



- Ngulube, P. 2005. Research procedures used by Master of Information Studies students at the University of Natal in the period 1982 – 2002 with special reference to their sampling techniques and survey response rates : A methodological discourse. *The International Information and Library Review Journal* 37:127-143.
- Ngulube, P. 2015. Trends in research methodological procedures used in knowledge management studies. *African Journal of Library, Archives and Information Science* 25(2): 125–143.
- Nguyen, LC. 2008. A survey of the application of Web 2.0 in Australasian University libraries. *Library Hi Tech* 26(4): 630–653.
- Nkembo, K., Koloseni, D. and Shimba, F. 2011. *ICT and the Education Sector in Tanzania: Effectiveness of Introducing and Applying ICT in Higher Learning Institutions in Tanzania: The Case of Ardhi University*. Saarbrücken, Germany: Lambert Academic Publishers.
- Nold, H. 2011. Making knowledge management work: tactical to practical. *Knowledge Management Research and Practice* 9(2): 84–94.
- Nold, H. 2009. New knowledge creation as a change management model. *Journal of Knowledge Management Practice* 10(3):1–10.
- Nonaka, I., Toyama, R. and Hirata, T. 2008. *Managing flow: A process theory of the knowledge-based Firm*. New York: Palgrave MacMillan.
- Nonaka, I. and Konno, N. 1998. The concept of “ba”: building a foundation for knowledge creation. *California Management Review* 40(3): 40–54.
- Nonaka, I. and Toyama, R. 2003. The knowledge-creation theory revisited: Knowledge creation as a synthesizing process. *Knowledge Management Research and Practice* 1(1): 2–10.
- Nonaka, I. and Takeuchi, H. 1995. *The knowledge-creating company*. New York, NY: Oxford University Press.
- Nonaka, I., von Krogh, G. & Voelpel, S. 2006. Organizational knowledge creation theory: evolutionary paths and future advances. *Organization Studies* 27(8): 1179–1208.
- Nonaka, I. 1994. A dynamic theory of organizational knowledge creation. *Organization Science* 5(1):14–37.
- Nonaka, I. 1991. The knowledge-creating company. *Havard Business Review* 69(6): 96–104.
- Nonaka, I., Byosiére, P. and Borucki, CC. and Konno, N. 1994. Organizational knowledge creation theory : A first comprehensive test. *International Business Review* 3(4): 337–351.
- Nonaka, I., Toyama, R. and Konno, N. 2000. SECI , ba and leadership : a unified model of dynamic knowledge creation. *Leadership* 33(1): 5–34.
- Nonaka , I., Byosiére, P., Borucki, CC. and Konno, N. 1994. Organizational knowledge creation theory: A first comprehensive test. *International Business Review* 3(4): 337–351.

- O'Dell, C. and Jackson, C. 1998. *If only we know what we know*. New York: The Free Press.
- O'Leary, Z. 2004. *The essential guide to doing research*. Thousands Oaks: Sage.
- O'Leary-Kelly, SW. and Vokurka, R. 1998. The empirical assessment of construct validity. *Journal of Operations Management* 16: 387–405.
- O'Reilly, T. 2005. What is Web 2.0?. Design patterns and business models for the next generation of software. Available: [http://www.im.ethz.ch/education/HS08/OReilly\\_What\\_is\\_Web2\\_0.pdf](http://www.im.ethz.ch/education/HS08/OReilly_What_is_Web2_0.pdf) (Accessed 03 March 2014).
- O'Sullivan, E., Rassel, GR. and Berner, M. 2008. *Research methods for public administrators*. New York, NY: Pearson Prentice Hall.
- Ocholla, D. and Bothma, T. 2007. trends, challenges and opportunities for LIS education and training in Eastern and Southern Africa. *New Library World* 180(1/2): 55–78.
- Ocholla, DN. and LeRoux, J. 2011. Conceptions and misconceptions of theoretical frameworks in library and information science research. In *The 6th Biennial Prolisa Conference*, Pretoria 9-11 March, 2011.
- Omekwu, C. 2006. Managing information and technology: cited in roles for libraries in developing countries. *The Electronic Library* 24(6): 861–872.
- Omona, W, Van der Weide, T. and Lubega, JT. 2010. Using ICT to enhance knowledge management in higher education: A conceptual framework and research agenda. *International Journal of Education and Development using ICT* 6 (4).
- Ongwen, P. 2012. Knowledge management and the role of libraries. Available: <http://www.slideshare.net/patrickalfredwaluchio/knowledge-management-and-the-role-of-libraries> (Accessed 1 August 2015).
- Onwuegbuzie, AJ. and Collins, K. 2007. A typology of mixed methods sampling designs in social science research. *The Qualitative Report* 12(2): 281–316.
- Onwuegbuzie, AJ. and Johnson, R. 2006. The validity issue in mixed research. *Research in the schools* 13(1): 48–63.
- Onwuegbuzie, AJ. and Leech, N. 2007. Validity and qualitative research: an oxymoron? *Quality and Quantity: International Journal of Methodology* 41: 233–249.
- Onwuegbuzie, A. 2003. Expanding the framework of internal and external validity in quantitative research. *Research in the Schools* 10(1): 71–90.
- Orr, E. and Persson, M. 2003. Performance indicators for measuring performance of activities in knowledge management projects, MS. Thesis. University of Gothenburg.
- OUT. 2005. *Open University of Tanzania (OUT). Prospectus. Unpublished document. Dar-es-Salaam. Open University of Tanzania. Dar-es-Salaam: Tanzania.*

- Pansiri, J. 2005. Pragmatism: a methodological approach to researching strategic alliances in tourism. *Tourism and Hospitality Planning and Development* 2(3): 191–206.
- Parasuraman, A., Zeithaml, VA. and Berry, L. 1985. A conceptual model of service quality and its implications for future research. *Journal of Marketing* 49:41–50.
- Parirokh, M., Daneshgar, F. and Fattahi, R. 2008. Identifying knowledge-sharing requirements in academic libraries. *Library Review* 57(2): 107–122.
- Parker, KR. and Chao, J. 2007. Wiki as a teaching tool. *Interdisciplinary Journal of Knowledge and Learning Objects* 3:57–72.
- Paroutis, S. and Al Saleh, A. 2009. Determinants of knowledge sharing using Web 2.0 technologies. *Journal of Knowledge Management* 13(4): 52–63.
- Patry, J. 2013. Beyond multiple methods: Critical multiplism on all levels. *International Journal of Multiple Research Approaches* 7(1): 50–65.
- Patton, M. 2002. *Qualitative research and evaluation methods*. 3<sup>rd</sup> ed. London: Sage Publications.
- Payne, G. and Payne, J. 2004. *Key concepts in social research*. London: Sage Publications.
- Pazi, S. and Chatwin, C. 2014. The impact of NICTBB in facilitating the e-services and m-services in Tanzania. *World Academy of Science, Engineering and Technology International Journal of Social Business, Psychological, Human Science and Engineering*, 8(3): 822–828.
- Pearlson, KE. and Saunders, C., 2009. *Strategic management information system* 4th ed., hoboken, NJ: John Wiley and Sons.
- Pearson, KE. and Saunders, C. 2009. *Strategic management information systems*. 4<sup>th</sup> ed. Hoboken, NJ: John Wiley and Sons.
- Pelizzari, E. 2003. Academic staff use, perception and expectations about open-access archives: a survey of social science sector at Brescia University. Available: [http://prints.rclis.org/archive/00000737/01/Academic\\_staff-perception\\_abot\\_arch](http://prints.rclis.org/archive/00000737/01/Academic_staff-perception_abot_arch) (Accessed 25 October 2015).
- Penzhorn, C. and Pienaar, H. 2009. The use of social networking tools for innovative service delivery at the University of Pretoria. *Innovation* (38): 66–77.
- Penzhorn, C. 2013. Th use of social media in teaching a campus-wide information literacy Course. *Mousaion* 31(3): 57–73.
- Perez, E. 2002. A second shot at the knowledge management challenge. *Online* 26(6); 25–29.
- Petter, S., DeLone, W. and McLean, E. 2008. Measuring information systems success: models, dimensions, measures, and interrelationships. *European Journal of Information Systems* 17(3): 236–263.
- Petter, S. and McLean, ER. 2009. A meta-analytic assessment of the DeLone and McLean IS success

- model: An examination of IS success at the individual level. *Information and Management* 46(3): 159–166.
- Philips, T. 1999. The truth about sharing knowledge. *Director* 52(12): 75.
- Pickard, A. 2007. *Research method in information*. London: Facet publishing.
- Pienaar, H. and Smith, I. 2007. Development of a Library 2.0 service model for an African library. Paper presented at the 73<sup>rd</sup> *International Federation of Library Associations and Institutions (IFLA) - World Library and Information Conference*, Durban South Africa. 19-23 August 2007.
- Plato, I. 1953. *Knowledge and reality* London: Macmillan.
- Du Pless, M. 2007. The role of knowledge management in innovation. *Journal of Knowledge Management* 11(4): 20–29.
- Polanyi, M. 1996. *The tacit dimension*. Gloucester, MA: Peter Smith.
- Polit, DF. and Beck, C. 2003. *Nursing research: principles and methods*. 7<sup>th</sup> ed. Philadelphia: Lippincott Williams and Wilkins.
- Politis, J. 2003. The connection between trust and knowledge management: what are its implications for team performance. *Journal of Knowledge Management* 7(5): 55–66.
- Ponelis, S. and Africa, S. 2013. Ethical risks of social media use by academic libraries Shana Ponelis. *Innovation* (47): 231–244.
- Powell, RR. and Connaway, L. 2007. *Basic research methods for librarians*. 4<sup>th</sup> ed. Westport: Libraries Unlimited Edition.
- Powell, RR. and Connaway, L. 2004. *Basic research methods for librarians*. London: Libraries Unlimited.
- Powell, WW. and Snellman, K. 2004. The knowledge economy. *Annual Review of Sociolog* 30: 199–220.
- Powell, R. 1997. *Basic research methods for librarians*. Westport, CT: Ablex Publishing.
- Prensky, M. 2010. Teaching digital natives: partnering for real learning. *International Journal for Educational Integrity* 6(2): 74–76.
- Probst, G., Raub, S., and Romhardt, K. 2000. *Managing knowledge: Building blocks for success*. Chichester: John Wiley and Sons Ltd.
- Procter, R., Williams, R., Stewart, J., Poschen, M., Snee, H., Voss, A. and Asgari-Targhi, M. 2010. Adoption and use of Web 2.0 in scholarly communications. *Philosophical Transactions of the Royal Society* 368(1926): 4039–4056.
- Punch, K. 1998. *Introduction to social research: qualitative and quantitative approaches*. London: Sage Publications.
- Raeth, P., Urbach, N., Smolnik, S., Butler, B. and Königs, P. 2010. The adoption of Web 2.0 in

- corporations: A process perspective. Paper presented at the 16<sup>th</sup> Americas Conference on Information Systems (AMCIS), Lima, Peru.
- Rah, JA., Gul, S. and Wani, A. 2010. University libraries: step towards a web based knowledge management system. *The Journal of Information and Knowledge Management Systems* 40(1): 24–30.
- Rai A., Lang, SS. and Welker, R. 2002. Assessing the validity of IS success models: an empirical test and theoretical analysis. *Information Systems Research* 13(1): 5–69.
- Raja, WA., Ahmad, Z. and Sinha, AK. 2009. Knowledge management and academic libraries in IT era: problems and positions. *Ical*: 701–722.
- Rajurkar, M. 2011. Knowledge management in academic libraries. *International Journal of Parallel and Distributed Systems* 1(1): 05–08.
- Ram, S., Anbu, JPAK. and Kataria, S. 2011. Responding to user's expectation in the library: innovative Web 2.0 applications at JUIT Library: A case study. *Program: Electronic Library and Information Systems* 45(4): 452–469.
- Ram, S., Kataria, S., Hopkinson, A. and Paliwal, N. 2010. Acceptance and usage of Web 2.0 services in libraries: a survey. Paper presented at the 2<sup>nd</sup> International Symposium on Emerging Trends and Technologies in Libraries and Information Services, the Jaypee University of Information Technology (JUIT) Wakhnaghat (HP), 3-5 June 2010.
- Ramírez, A., Morales, V. and Aranda, D. 2012. Knowledge creation and flexibility of distribution of information. *Industrial Management and Data Systems* 112(2): 166–185.
- Raven, A. and Prasser, S. 1996. Information technology support for the creation and transfer of tacit knowledge in organizations. Paper presented at the *Association for Information Systems 1996 Americas Conference*, Phoenix: CAIS.
- Rawtani, M. 2011. Basic concept of Library 2.0 is a mix of rapid change in technology, management and innovative services in the library: a bird eye view. Paper presented at the 8<sup>th</sup> International CALIBER Goa University, March 2 - 4 2011.
- Razi, MJM. and Karim, N. 2011. Investigating individuals' intention to be involved in knowledge management process. *American Journal of Economics and Business Administration* 3(3): 444–449.
- Razi, MJM., Karim, NS. and Lumpur, K. 2011. Investigating individuals' intention to be involved in knowledge management process. *American Journal of Economics and Business* 3(3): 444–449.
- Redden, C. 2010. Social bookmarking in academic libraries: Trends and applications. *The Journal of Academic Librarianship* 36(3): 219–227.
- Reitz, J. Online dictionary for library and information science. <http://lu.com.dlis/> (Accessed 29 August 2014).

- Riege, A. 2005. Three-dozen knowledge sharing barriers managers must consider. *Journal of Knowledge Management* 9(3):18–35.
- Roknuzzaman, M. 2012. Changing paradigms in library education: From library science to information science to knowledge science. *Eastern Librarian* 23(1): 1-23.
- Roknuzzaman, M. and Umemoto, K. 2009a. How library practitioners view knowledge management in librariesA qualitative study. *Library Management* 30(8): 643–656.
- Roknuzzaman, M. and Umemoto, K. 2009b. Knowledge management education in library and information science schools: An exploratory study. *Asia-Pacific Conference on Library and Information Education and Practice*: 27–37.
- Romm, NRM. and Ngulube, P. 2014. Mixed method research. In *Addressing research challenges: making headway for the developing researchers* edited by M. Mathipa and ER. Gumbo. Noordwyk: Mosala-Masepi Publishers: 157–175.
- Romm, N. 2014. Qualitative data analysis, interpretation, and justification: Key elements. In *Addressing research challenges: making headway for the developing researchers* edited by M. Mathipa and ER. Gumbo. Noordwyk: Mosala-Masepi Publishers: 131–143.
- Roth, J. 2003. Enabling knowledge creation: learning from a research and development organization. *Journal of Knowledge Management* 7(1): 32–48.
- Rowley, J. 2001. Knowledge management in pursuit of learning: the learning with knowledge cycle. *Journal of Information Science* 27(4): 227–237.
- Rowley, J. 2003. Knowledge management the new librarianship? From custodians of history to gatekeepers to the future. *Library Management* 24(8/9): 433–440.
- Rowley, J. 2000. Is higher education ready for knowledge management? *The International Journal of Educational Management* 14(7): 325–333.
- Rowley, J. 2002. Using case studies in research. *Management Research News* 25(1): 16–27.
- Rowley, J. 1999. What is knowledge management? *Library Management* 20(8): 416–420.
- Ruggles, R. 1997. Knowledge tools: using technologies to manage knowledge better. <http://www.businessinnovation.ey.com/mko/pdf/TOOLS.PDF> (Accessed 7 July 2015).
- Rui, C. 1999. Thoughts and technologies of knowledge management. *Information Knowledge in Libraries* (1): 10–13.
- Rumizen, M. 2002. *The complete idiot's guide to knowledge management*. Madison: CWL Publishing Enterprises.
- Russell, E. 2007. *The use of Facebook functions and the effect it has on other methods of communication*. Department of Information Studies: University of Sheffield.
- Saadon, K. 2001. Conceptual framework for the development of knowledge management system in

- agricultural research and development. Malaysian Agricultural Research and Development Institute (MARDI). <http://my.apan.net/meeting/downloads/nrKnowMv4.pdf> (Accessed 03 July 2014).
- Salajan, FD. and Mount, G. 2012. Leveraging the power of Web 2.0 tools: a Wiki platform as a multimedia teaching and learning environment in dental education. *Journal of Dental Education* 76(4): 427–436.
- Sarantakos, S., 2013. *Social Research*. 4<sup>th</sup> ed. Hampshire: Palgrave Macmillan.
- Sarrafzadeh, M. 2008. The implications of knowledge management for the library and information professionals. A thesis submitted in fulfillment of the requirements for the degree of Doctor of Philosophy. University of RMIT Melbourne, Australia.
- Sarrafzadeh, M., Martin, B. and Hazeri, A. 2010. Knowledge management and its potential applicability for libraries. *Library Management* 31(3): 198–212.
- Saunders, M., Lewis, P. and Thornhill, A. 2009. *Research methods for business students*. 5<sup>th</sup> ed. Harlow: Prentice Hall.
- Scarborough, H. 2003. Knowledge management, HRM and the innovation process. *International Journal of Manpower* 24(5): 501-16.
- Schein, E. 1992. *Organizational Culture and Leadership*. San Fransisco, CA: Jossey-Bass Publishers.
- Schlenkrich, L. and Sewry, D. 2012. Factors for successful use of social networking sites in higher education. *South African Computer Journal* 49: 12–24.
- Schmidt, J. 2007. Promoting library services in Google world. *Library Management* 28(6/7): 337–346.
- Schneckenberg, D. 2009. Web 2.0 and the empowerment of the knowledge worker. *Journal of Knowledge Management* 13(6): 509–520.
- Schultze, U. and Leidner, D. 2002. Studying knowledge management in information systems research: discourses and theoretical assumptions. *MIS Quarterly* 26(3): 213–242.
- Schulze, S. 2003. Views on the combination of quantitative and qualitative research approaches. *Progressio* 25(2): 8-20.
- Scott, J. 1998. Organizational knowledge and the internet. *Decision Support Systems* 23(1): 3–17.
- Scupola, A. and Nicolajsen, H. 2010. Service innovation in academic libraries: is there a place for the customers. *Library Management* 31(4/5): 304–318.
- Seddon, P. 1997. A respecification and extension of the DeLone and Mclean model of IS success. *Information Systems Research* 8(3): 240–253.
- Sedoyeka, E., Hunaiti, Z. and Tairo, D. 2010. Evaluation of WiMAX QoS in a Developing Country's Environmentl , Computer Systems and Applications (AICCSA). Paper presented at the IEEE/ACS International Conference, 16-19 May 2010: 1–6.
- Sekaran, U. 2003. *Research methods for business: a skill-building approach*. 4<sup>th</sup> ed. New York: John

Wiley and Sons.

- Shadish, WR., Cook, TD. and Campbell, D. 2001. *Experimental and quasi-experimental designs for generalized causal inference*. Boston: Houghton Mifflin.
- Shang, SSC. Li., EY, Wu, YL. and Hou, OCL. 2011. Understanding Web 2.0 service models: A knowledge-creating perspective. *Information and Management* 48(4–5): 178–184.
- Shanhong, T. 2000. Knowledge management in libraries in the 21<sup>st</sup> Century. Paper Presented at 81<sup>st</sup> International Federation of Library Associations and Institutions (IFLA) - World Library and Information Conference, Jerusalem, Israel, 13-18 August.
- Shani, AB., Sena, JA. and Olin, T. 2003. Knowledge management and new product development: a study of two companies. *European Journal of Innovation Management* 6(3): 137–49.
- Sheng, X. and Sun, L. 2007. Developing knowledge innovation culture in libraries. *Library Management* 28(1/2): 36–52.
- Shih, H. 2004. Extended technology acceptance model of internet utilization behavior. *Information and Management* 41(6): 719–729.
- Shirazi, A., Mortazavi, S. and Azad, NP. 2011. Factors affecting employees' readiness for knowledge management. *European Journal of Economics, Finance and Administrative* 33:167-177.
- Si, L., Shi, R. and Chen, B. 2011. An investigation and analysis of the application of Web 2.0 in Chinese university libraries. *The Electronic Library* 29(5): 651–668.
- Siddike, MAK. and Islam, MS. 2011. Exploring the competencies of information professionals for knowledge management in the information institutions of Bangladesh. *International Information and Library Review*, 43(3): pp.130–136.
- Silverman, D. 2006. *Interpreting qualitative data: methods for analyzing talk, text and interaction*. 3<sup>rd</sup> ed. London: Sage.
- Singh, S. 2007. What are we managing knowledge or information? *VINE: The Journal of Information and Knowledge Management Systems* 37(2): 169–179.
- Sinotte, M. 2004. Exploration of the field of knowledge management for the library and information professional. *Libri* 54: 190–198.
- Skyrme, D. 1999. *Knowledge networking: creating the collaborative enterprise*. Oxford: Butterworth-Heinemann.
- Skyrme, D. 1997. The globalisation and virtualisation of knowledge. *Gyosei Journal* 1(3): 1–18.
- Slater, M. 1990. *Research methods in library and information studies*. London: Library Association
- Smith, HA. and Mckeen, J. 2003. Instilling a knowledge-sharing culture, queens center for knowledge-based enterprises. [http://business.queensu.ca/centres/monieson\\_old/docs/working/working\\_03-11.pdf](http://business.queensu.ca/centres/monieson_old/docs/working/working_03-11.pdf) (Accessed 14August 2015).



- Smith, L., Campbell, F., Sbramanian, A., Bird, D. and Nelson, A. 2001. Strategic planning for municipal information systems: some lessons from a large U.S. city. *American Review of Public Administration* 31(2): 139–57.
- Smith, K. 2002. What is the knowledge economy? Knowledge intensity and distribution of knowledge bases. In the *Distribution papers from United Nations University*, Institute of new Technology, No. 6.
- Smith, V. 1998. Measuring the benefits of social science research. Available: [www.http:ifpri.org/sites/default/files/pubs/impact/iadp02.pdf/](http://www.ifpri.org/sites/default/files/pubs/impact/iadp02.pdf/) (Accessed 22 November 2014).
- Snowden, D. 1998. A framework for creating a sustainable programme. In *Knowledge management: a real business guide* edited by S. Rock and J. Reeves, J. London: Caspian Publishing Limited.
- Sohail, MS. and Daud, S. 2009. Knowledge sharing in higher education institutions: Perspectives from Malaysia. *Vine* 39(2): 125–142.
- Stangor, C. 2011. *Research Methods for the Behavioral Sciences*. 4<sup>th</sup> ed. Belmont: Wadsworth, Cengage Learning.
- Stankosky, MA. 2005. Advances in Knowledge Management: University Research Toward an Academic Discipline. <http://portal.acm.org/citation.cfm?id=1076338> (Accessed 16 August 2015).
- Steininger, K., Rückel, D., Dannerer, E. and Roithmayr, F., 2010. Healthcare knowledge transfer through a Web 2.0 portal: An Austrian approach. *International Journal of Healthcare Technology and Management* 11: 13–30.
- Stephens, M. 2006. Exploring Web 2.0 and libraries. *Library Technology Reports* 42(4): 8–14.
- Stephens, M. and Collins, M. 2007. Web 2.0, Library 2.0, and the Hyperlinked Library. *Serials Review* 33(4): 253–256.
- Stoelting, R. 2002. Structural equation modelling/path analysis. <http://userwww.sfsu.edu/efs/classes/bio1710/path/SEMeepage.htm> (Accessed 6 February 2015).
- Strohmaier, M.B., 2003. A Framework and a tool for business process oriented knowledge infrastructure development, Ph.D Thesis, Institute for Knowledge Management and Knowledge Visualization, Graz University of Technology, Austria.
- SUA. 2008. Sokoine University of Agriculture (SUA). Prospectus 2008/2009. Unpublished. Sokoine University of Agriculture.
- Sveiby, K. 2001. A knowledge-based theory of the firm to guide in strategy formulation. *Journal of Intellectual Capital* 2:344–358.
- Swan, J., Scarbrough, H. and Preston, J., 1999. Knowledge management the next fad to forget people? Paper presented at the 7<sup>th</sup> European Conference on Information Systems, Copenhagen, Denmark, 25th -25th June, 1999: 668–678.

- Creative Research Systems. 2003. Sample size Calculator. Available: <http://www.surveysystem.com/sscalc.htm> (Accessed 14 June 2014).
- Takeuchi, H. 2001. Towards a universal management concept of knowledge. In *Managing industrial knowledge: creation, transfer and utilization* edited by I. Nonaka, I. and D. Teece. London: Sage: 315–329.
- Tang, H. 1998. An inventory of organisational innovativeness. *Technovation* 19(1): 41–51.
- Tanner, K. 2000. Survey research. In *Research methods for students and professionals: information management and system*, edited by K. Williamson. New South Wales: Charles Stuart University: 71–91.
- Tanner, K. 2013. Survey designs. In *Research methods: information, systems and contexts*, edited by K. Williamson and G. Johnson. Prahran: Tilde: 143-171.
- Tarade, RS. and Singh, N. 2013. Web 2.0 technologies in academic libraries. *International Journal of Science and Research* 4(7): 2503-2505.
- Tare, M. 2003. A future for human resources: a specialized role in knowledge management. Ph.D Thesis. Swinburne University of Technology, Melbourne, Australia.
- Tashakkori, A. and Teddlie, C. 1998. *Mixed methodology: combining qualitative and quantitative approaches*. Thousand Oaks, CA: Sage.
- Che Rusuli, MS., Tasmin, R., Takala, J., Norazlin, H., Phusavat, K., Walsh, J. and Yaacob, RA. 2012. Relationship between knowledge management practices and library users' satisfaction: A preliminary result of the Malaysian University Libraries: In *Proceedings of 2013 International Conference on Technology Innovation and Industrial Management*, Phuket, Thailand, 29-31 May 2013.
- TCU. 2005. Tanzania Commission for Universities (TCU). 2005. TCU Strategic plan for 2005/06-2009/10. [http://planipolis.iiep.unesco.org/upload/Tanzania\\_UR/Tanzania\\_UR\\_TUC\\_strategy.pdf](http://planipolis.iiep.unesco.org/upload/Tanzania_UR/Tanzania_UR_TUC_strategy.pdf) (Accessed 5 May 2015).
- TCU. 2014. Tanzania Commission for Universities (TCU): Registered universities. <http://www.tcu.go.tz/> (Accessed 6 November 2014).
- Tedd, L. 2008. Editorial. *Program* 42(3): 213–214.
- Teddlie, C. and Tashakkori, A. 2009. *Foundation of mixed methods research: integrating quantitative and qualitative approaches in the social and behavioral sciences*. Thousands Oaks, CA: Sage.
- Teerajetgul, W. and Charoenngam, C. 2006. Factors inducing knowledge creation: empirical evidence from Thai construction projects. *Engineering, Construction and Architectural Management* 13: 584–599.
- Thitithananon, P., Klaewthanong, T. and Ratchathani, U. 2007. Knowledge management is a perfect

- education development tool: is Thailand's higher education really ready to embrace It? *Journal of Knowledge Management Practice* 8(2): 1–26.
- Thompson, RL., Higgins, CA. and Howell, J. 1991. Personal computing: toward a conceptual model of utilization. *MIS Quarterly* 15(1): 124–143.
- Tise, ER. and Raju, R. 2013. Open access : A new dawn for knowledge management. Paper presented at the IFLA World Library and Information Congress 79<sup>th</sup> IFLA General Conference and Assembly 17-23 August 2013, Singapore: 1–10.
- TLA. 2003. Tanzania library services. [http://www.worlib.org/vol05no1/dahlgren\\_v05n1.shtml](http://www.worlib.org/vol05no1/dahlgren_v05n1.shtml) (Accessed 17 March 2013).
- Todd, RJ. and Southon, G. 2001. Educating for a knowledge management future: perceptions of library and information professionals. *The Australian Library Journal* 50(4): 313–27.
- Totterman, A. and Widen-Wulff, G. 2009. Web 2.0 and collaborative knowledge in the university context. Paper presented at the IX Congress, Isko-Spain Valencia, 11-13 2009.
- Townley, C. 2001. Knowledge management and academic libraries. *College and Research Libraries* 62 (1): 44-45.
- Tripathi, M. and Kumar, S. 2010. Use of Web 2.0 tools in academic libraries: A reconnaissance of the international landscape. *International Information and Library Review* 42(3): 195–207.
- Tripathy, J., Patra, N. and Pani, M., 2007. Leveraging knowledge management: Challenges for the information professional. *DESIDOC Bulletin of Information Technology* 27(6): 65–72.
- Trivedi, M. 2007. Knowledge management in health science libraries. *Electronic Journal of Academic and Special Librarianship* 8(2).
- UDOM. 2009. The University of Dodoma (UDOM). [http://www.udom.ac.tz/Files/the\\_university.php](http://www.udom.ac.tz/Files/the_university.php) (Accessed 24 September 2014).
- UDOM. 2007. The University of Dodoma (UDOM). Address by his Excellency, former president of the United Republic of Tanzania and Chancellor of the University of Dodoma, Benjamin W. Mkapa to pioneer students of the University of Dodoma, November 2, 2007. [http://www.udom.ac.tz/downloads/Chancellor's\\_speech.pdf](http://www.udom.ac.tz/downloads/Chancellor's_speech.pdf) (Accessed 24 April 2015).
- UDSM. 2007. *The University of Dar es Salaam (UDSM). 2007. Prospectus 2007/2008*. Dar-es-Salaam: University Press.
- Ugwu, CI. and Ezema, I. 2010. Competencies for successful knowledge management applications in Nigerian academic libraries. *International Journal of Library and Information Science*, 2(December):184–189.
- UNISA. 2010. *University of South Africa guidelines for master's and doctoral studies in information science.*, Pretoria. University of South Africa Press.

- Urbach, N. and Muller, B. 2012. The updated DeLone and McLean model of information systems success. In *Information systems theory: explaining and predicting our digital society*, edited by Y.K. Dwivedi, M.R. Wade and S.L. Schneberger. New York, NY: Springer: 1–18.
- URT. 2005. United Republic of Tanzania: Tanzania national website. <http://www.tanzania.go.tz/agriculture.html> (Accessed 6 June 2014).
- Vacca, J. 2010. *Managing information security*. Amsterdam: Syngress.
- Variant, A. and Puspitasari, D. 2013. Knowledge sharing in libraries :A case study of knowledge sharing strategies in Indonesian university libraries abstract. Paper presented at the 79<sup>th</sup> *International Federation of Library Associations and Institutions (IFLA) - World Library and Information Conference*, Singapore, 17-23 August 2013:1–11.
- Vasconcelos, A. 2008. Dilemmas in knowledge management. *Library Management*. 29(4/5): 422–443.
- Veletsianos, G. 2013. Open practices and identity: evidence from researchers and educators' social media participation. *Technology. British Journal of Educational* 44(4): 639–651.
- Virkus, S. 2008. Use of Web 2.0 technologies in LIS education: experiences at Tallinn University, Estonia. *Program: electronic library and information systems* 42(3): 262–274.
- Vlahos, GE., Ferratt, TW. and Knoepfle, G. 2004. The use of computer-based information systems by German managers to support decision making. *Information and Management*, 41(6): 763–779.
- Wachira, E. 2012. Tanzania: ICT in education situational analysis. [http://www.gesci.org/assets/files/Knowledge Centre/Situational Analysis Tanzania.pdf/](http://www.gesci.org/assets/files/Knowledge%20Centre/Situational%20Analysis%20Tanzania.pdf) (Accessed 2 April 2014).
- Wagner, C. 2004. Wiki: a technology for conversational knowledge management and group collaboration. *Communication of the Association for Information Systems* 13: 265–289.
- Wagner, C. and Majchrzak, A. 2007. Enabling customer-centricity using Wikis and the Wiki way. *Journal of Management Information Systems* 23: 17–43.
- Walczak, S. 2005. Organisational knowledge management structure: learning organisation. *Journal of Knowledge Management* 12(4): 330–339.
- Waltz, CF., Strickland, OL. and Lenz, E. 2010. *Measurement in nursing health research*. 4<sup>th</sup> ed. New York, NY: Springer.
- Wamundila, S. and Ngulube, P. 2011. Enhancing knowledge retention in higher education: a case of the University of Zambia. *Information Management. South African Journal* 13(1): 439–448.
- Wang, S. and Noe, R. 2010. Knowledge sharing: a review and directions for future research. *Human Resource Management Review* 20: 115–131.
- Wang, YS. 2008. Assessing e-commerce systems success: A respecification and validation of the DeLone and McLean model of IS success. *Information Systems Journal* 18(5): 529–557.

- Waxman, HC. and Padrón, Y. 2004. The uses of the classroom observation schedule to improve classroom instruction. In *Observational research in U. S. classrooms: new approaches for understanding cultural and linguistic diversity* edited by H. Waxman. West Nyack, NY: Cambridge University Press.
- Webb, P. 2007. YouTube and libraries: It could be a beautiful relationship. *College and Research Libraries News*:355–356.
- Welman, C., Kruger, F. and Mitchell, B. 2005. *Research methodology*. 3<sup>rd</sup> ed. Cape Town: Oxford University Press Southern Africa.
- Wen, S. 2005. In Implementing knowledge management in academic libraries: a pragmatic approach. Paper presented at the 3<sup>rd</sup> China-US Library Conference, Shanghai, March 22-25. Also Available: <http://www.white-clouds.com/iclc/cliej/cl19wen.htm> (Accessed 10 April 2016).
- Werner, A. 2011. *Organisational behavior: a contemporary South African Perspective*. 3<sup>rd</sup> ed. Pretoria, SA: Van Schaik Publishers.
- White, M. 2001. White, MD. 2001. Diffusion of an innovation: digital reference service in Carnegie Foundation Master's (Comprehensive) academic institution. libraries. *The Journal of Academic Librarianship* 27(3): 173–187.
- White, T. 2004. Knowledge management in an academic library based on the case study “Knowledge management in OULS”. The paper presented at the 70<sup>th</sup> International Federation of Library Associations and Institutions (IFLA) - World Library and Information Conference, Buenos Aires, Argentina, 22 – 27 August 2004. Also Available: <http://www.ifla.org/IV/ifla70/papers/089e-White.pdf> (Accessed 26 April 2016).
- White, W. 2009. Institutional repositories: Contributing to institutional knowledge management and the global research commons. In a paper presented at 4th International Open Repositories Conference, May 18–21, Atlanta, Georgia. Available <http://eprintsoton.ac.uk/48552/> (Accessed on 17 May 2015).
- Wickramasinghe, N. 2003. Do we practice what we preach? are knowledge management systems in practice truly reflective of knowledge management systems in theory? *Journal 9 (3): Business Process Management Journal* 9(3):295 – 316.
- Wickramasinghe, N. 2006. Knowledge creation. In *Encyclopedia of knowledge management* edited by D. Schwartz. Hershey: PA: Ideal Group Reference.
- Wickramasinghe, N. 2007. *Knowledge-based enterprise: theories and fundamentals*. Hershey: Idea Group Publishing.
- Wiggins, B. 2000. *Effective document management: unlocking corporate knowledge*. Gower: Aldershot.
- Wiig, K. 1993. *Knowledge management foundations: Thinking about thinking: how people and*

- organizations create, represent, and use knowledge*. Arlington, Tex: Schema Press.
- William, K., Burstein, FV. and McKemish, S. 2000. The two major traditions of research. In *Research Methods for Students and Professionals Information Management and Systems*, edited by N.S.W. Wagga. Centre for Information studies, Charles Sturt University.
- Williams, A., Giuse N., Koonce, T., Kou, Q. and Giuse, D. 2004. Using knowledge management practices to develop a state of the art digital library. *MedInfo* 11(1): 99–103.
- Williamson, K. 2013. Research concepts. In *Research methods: information, systems and contexts* edited by K.Williamson. and G. Johnson. Prahran: Tilde: 6–17.
- Willig, C. 2001. *Introducing qualitative research in psychology: adventures in theory and method*. Buckingham: Open University Press.
- Wixom, BH. and Todd, P. 2005. A theoretical integration of user satisfaction and technology acceptance. *Information Systems Research* 16(1): 85–102.
- Woldofa, K. 2014. Adoption of Web 2.0 in academic libraries of top African universities. *The Electronic Library* 32(2): 262–277.
- Wong, KY. and Aspinwall, E. 2004. Knowledge management implementation frameworks: A review. *Management. Knowledge and Process* 11(2): 93–104.
- Wong, K. 2005. Critical success factors for implementing knowledge management in small and medium enterprises. *Industrial Management and Data Systems* 105(3): 261–279.
- Wu, J. and Wang, Y. 2006. Measuring KMS success: A respecification of the DeLone and McLean’s model. *Information and Management* 43(6): 728–739.
- Xia, Z. 2009. Marketing library services through Facebook groups. *Library Management* 30(6/7): 469–478.
- Xu, C. Ouyang, F. and Chu, H. 2009. The academic library meets Web 2.0: Applications and implications. *Journal of Academic Librarianship* 35(4): 324–331.
- Yan, L., Yang, J. and Wang, W., 2008. Using Web 2.0 for knowledge management in higher education. Paper presented at the *2008 International Symposium on Knowledge Association and Modeling (KAM)*, Huazhong Normal University Wuhan, China, 21-22 December 2008: 419–423.
- Yang, HD. and Yoo, Y. 2004. It’s all about attitude: revisiting the technology acceptance model. *Decision Support Systems* 38(1):19–31.
- Yang, HL. and Wu, TCT., 2006. Knowledge sharing in an organization - Share or not? *International Conference on Computing and Informatics, ICOCI* :1–7.
- Yang, J. 2008. Individual attitudes and organisational knowledge sharing. *Tourism Management* 29:345–353.
- Yeh, YJ., Lai, SQ. and Ho, CT. 2006. Knowledge management enablers: a case study. *Industrial*

- Management and Data Systems* 106(6): 793–810.
- Yin, R. 2008. *Case study research: design and methods*. Thousands Oaks, CA: Sage.
- Yonazi, J. 2012. Status of the National ICT broadband backbone (NICTBB) and prospects for local contents development in Tanzania. Paper presented at the ICT4D stakeholders forum.
- Yu, SH., Kim, YG. and Kim, M. 2004. 2004. Linking organizational knowledge management driver to Knowledge Management Performance: an exploratory study in the. Paper presented at the 37<sup>th</sup> Annual Hawaii International Conference on System Science, 5-8 January 2004. Manoa.
- Yu, S. 2008. Implementation of an innovative RFID application in libraries. *Library Hi Tech* 26(3): 398–410.
- Yu, TK., Lu, LC. and Liu, TF. 2010. Exploring factors that influence knowledge sharing behavior via weblogs. *Computers in Human Behavior* 26(1): 32–41.
- Yuthas, K. and Young, S. 1998. Material matters: assessing the effectiveness of materials management IS. *Information and Management* 33(3): 115–124.
- Zack, M. 1999. Managing codified knowledge. *Sloan Management Review* 40(4): 45–58.
- Zauszniewski, B.A. 2012. Methodological triangulation: an approach to understanding data. *Nurse Researcher* 20(2): 40-43.
- Zhang, J., Faerman, SR. and Cresswell, A. 2006. The effect of organizational/technological factors and the nature of knowledge on knowledge sharing. Paper presented at the 39<sup>th</sup> Annual Hawaii International Conference on System Science, 3-6 January 2006.
- Zheng, W. 2005. Organizational cultural factors that affect knowledge management effectiveness. In *Academy of Human Resource Development conference proceedings Bowling Green, OH* edited by MM: 497–504.
- Zhou, AZ. and Fink, D. 2003. Knowledge management and intellectual capital: an empirical examination of current practice in Australia. *Knowledge Management Research and Practice* 1(2):86–94.

## APPENDICES

### Appendix 1: Research objectives, research questions and data collection tools/information sources

Research objectives	Research questions	Data collection tools/information sources
To determine the level of KM awareness among library staff in academic libraries in Tanzania.	What are levels of KM awareness among library in academic libraries in Tanzania?	Literature review; Questionnaire; Interviews.
To assess the application and benefits of KM practices in academic libraries in Tanzania.	What are the application and benefits of KM practices in academic libraries in Tanzania?	Literature review; Questionnaire; Interviews.
To examine KM enablers for the application of KM practices in academic libraries in Tanzania.	What are KM enablers for the application of KM practices in academic libraries in Tanzania?	Literature review; Questionnaire; Interviews; Observation.
To examine knowledge creation and knowledge sharing practices in academic libraries.	What are the activities conducted to enhance the creation and sharing of knowledge in academic libraries in Tanzania?	Literature review; Questionnaire; SECI processes
To investigate the access and use of Web 2.0 tools in academic librarians in Tanzania.	How do Web 2.0 tools could be accessed and what are the uses of Web 2.0 tools in academic	Literature review; Questionnaire;



	libraries in Tanzania?	Interviews.
To assess the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania.	To what extent does the application of Web 2.0 tools enhance KM practices in academic libraries in Tanzania?	Literature review; Questionnaire; SECI processes
To investigate the factors that affect the application of Web 2.0 tools in KM practices in academic libraries	What are the factors that affect the application of Web 2.0 tools to enhance KM practices in academic libraries?	Literature review; Questionnaire; Interviews; Hypotheses testing.
To determine the challenges that hinder the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania.	What are the challenges that hinder the application of Web 2.0 tools to enhance KM practices in academic libraries?	Literature review; Questionnaire; Interviews.

## **APPENDIX 2: Survey questionnaire for library staff**

### **Informed consent**

Dear Participant,

I am gathering data for a research project in fulfilment of my PhD at the University of South Africa (UNISA) in the Department of Information Science.

For your information, I have attached a narrative discussion of my dissertation, which provides some information about the study I would like to conduct among the eight public universities in Tanzania; and the potential benefits the results might contribute to the improvement of the academic libraries in Tanzania.

Please submit the provided survey before 30 September 2015. The survey is not intrusive and takes on average about 40 minutes to complete. At this point, I have successfully submitted and defended my research proposal at UNISA.

The following is a brief overview of the study:

### **The title of the research study:**

Application of web 2.0 tools to enhance KM practices in academic libraries in Tanzania.

### **Potential risks to participants:**

There are no apparent risks to the participants involved in this study.

### **Protection of participants, identity and confidentiality:**

DO NOT write your name on this survey or the answer sheet. The answers you give will be kept private. No one will know how you answer. Answer the questions based on what you really know or do. There is no right or wrong answers. This information will be confidentially collected, handled and stored for further references, and later will be destroyed completely. Only the study coordinator may be able to see your information but will be unable to link that information to you.

### **Questions and persons to contact:**

The interviewer will answer all questions that you may have to clear your doubts. If you have any questions, please send them to the researcher, Ms.Neema Florence Mosha – [florenceneema@gmail.com](mailto:florenceneema@gmail.com) or [floraneema2@yahoo.com](mailto:floraneema2@yahoo.com) . Mobile: +255 754285601

**Consent:**

1. I have read the information sheet concerning this study;
2. I confirm that I have had the opportunity to ask questions about this study;
3. I confirm/not confirm to answer questions properly and to submit the questionnaire as indicated;
4. I have been given enough time and opportunity to decide whether I want to take part in this study;
5. I understand that at any time I may withdraw from this study; and
6. I agree to take part in this study.

Participant’s signature:.....Date:.....

Researcher’s signature:..... Date:.....

**Please could you kindly answer the following questions by:**

- Placing an (X) in the given box when selecting an appropriate answer; OR
- Entering information in the given box/space; and
- Entering (N/A) in the given box, if the question is not applicable to you.

**Demographic information**

Q1	Please indicate your gender group				1	Male		2	Female	
Q2	Please indicate your age group		1	21-30	2	31-40	3	41-50	4	Above 51
Q3	Which university (academic library) are you current working? <b>Please mark the appropriate answer</b>									
1	Ardhi University(ARU) Library									
2	Open University of Tanzania (OUT) Library									
3	Muhimbili University of Health and Allied Sciences (MUHAS) Library									
4	Mzumbe University (MU) Library									
5	Sokoine National Library (SNAL)									
6	State University of Zanzibar (SUZA) Library									
7	University of Dar-es-Salaam (UDSM) Library									
8	University of Dodoma (UDOM) Library									

Q 4	What is your rank or job position in your library? <b>Please mark the appropriate answer based on the following categories</b>		
1	<b>Administrative staff</b>	2	<b>Academic staff</b>
	<i>Library Assistant</i> <i>Librarian</i> <i>IT specialists</i> <i>Principal Librarian</i> <i>Library Officer</i> <i>Chief Librarian</i> <i>System Librarian</i> <i>Library Secretary</i> <i>Library Accountant</i> <i>Human Resources Officer</i> <i>Legal Officer</i>		<i>Library Professor</i> <i>Associate Library Professor</i> <i>Senior Librarian</i> <i>Librarian</i> <i>Assistant Librarian Trainee</i> <i>Assistant Librarian</i>
Q 5	Which section/department are you working in the library? Please specify.....		
1	Readers' services		
2	Collection development		
3	Library schools and information studies		
4	E-resources and mobilisation		

**Knowledge management (KM) awareness**

Q 6	What is your level of awareness of the KM concept? <b>Please mark the appropriate response</b>		
1	I had never heard of KM until now		
2	I have heard of KM but I am not exactly sure of the concept		
3	I have heard the term KM but it has been a challenge for me to understand		
4	I have adequate information about KM		
Q 7	Have you ever attended any KM training?		
1	Yes	2	No
Q 8	If yes, in (Q 7) above, how did you get KM training?		

1	Short course e.g. diploma, certificate				
2	Long course e.g. degree				
3	Long course e.g. postgraduate				
4	Self-study				
Q 9	Which type of knowledge(s) you think you need to perform your duties well Please mark the appropriate response				
1	Library collection	6	Web 2.0 tools	11	Repositories
2	Service delivery	7	Cataloguing and classification	12	Library management systems
3	Reference services	8	Management and administration	13	Marketing and promoting library services
4	Budgeting	9	Information learning literacy	14	Strategic planning
5	Information access and retrieval	10	Collection development	15	Borrowing and lending services
16	Research and publications				

### The application and benefits of KM practices in the academic libraries

Q 10	Does your Library/University apply KM practices? <b>Please mark the appropriate response</b>					
1	Yes	2	No			
Q 11	Please select the appropriate unit/department in which knowledge management practices can be applied within an academic environment. <b>Please mark the appropriate response(s)</b>					
1	University Library	5	Research Directorates			
2	Knowledge Management Unit	6	Schools/faculty			
3	IT Department	7	Documentation Centre			
4	Human Resource Management Unit					
Q 12	What are the benefits of applying of KM practices in academic libraries? <b>Please circle the appropriate answer following the criteria below: 1-strongly disagree; 2-disagree; 3-neutral/undecided; 4-agree; 5-strongly agree</b>					
1	To identify knowledge expertise of the organisation	5	4	3	2	1
2	To create knowledge repositories	5	4	3	2	1
3	To improve library services and productivity	5	4	3	2	1
4	To establish best practices	5	4	3	2	1

5	To develop corporate memory				5	4	3	2	1
6	To enhance knowledge innovation				5	4	3	2	1
7	To manage information explosion				5	4	3	2	1
Q 13	Is KM integrated into library policy or other related policy in your institution?								
1	Yes	2	No	3	Not sure				

### KM enablers for the effective KM practices application

Q14	What are the KM enablers which could be employed for effective KM practices application in academic libraries? <b>Please circle the appropriate answer for each of the following statements using the scales below: 1-strongly disagree; 2-disagree; 3-neutral/undecided; 4-agree; 5-strongly agree</b>								
1	IT facilities and support are available to enhance KM practices				5	4	3	2	1
2	Organisation provides enough trust to staff to join KM practices				5	4	3	2	1
3	KM training and education are usually conducted to impart staff with various KM techniques				5	4	3	2	1
4	Management support and good leadership are provided to enhance KM practices				5	4	3	2	1
5	Organisation provides incentives for members participated in KM practices in the library				5	4	3	2	1
6	Organisational culture is provided to support KM practices				5	4	3	2	1
7	Members are willing to participate in KM practices within my library				5	4	3	2	1
8	KM policy and guidelines are provided to enhance KM practices in my library				5	4	3	2	1

### Knowledge creation and sharing activities by using SECI processes

Q 15	What activities are conducted to create and share knowledge in your library? <b>Please circle the appropriate answer for each of the following statements using the criteria below: 1-strongly disagree; 2-disagree; 3-neutral/undecided; 4-agree; 5-strongly agree</b>								
<b>Q 15 (a) Socialisation (creating new knowledge through shared experiences)</b>									
1	Gather knowledge from various library activities such as staff meetings				5	4	3	2	1
2	Share experiences with library staff and library users on various issues such as borrowing books, reference queries etc.				5	4	3	2	1
3	Interact and conduct departmental meeting with external experts in the field of library and information science				5	4	3	2	1

4	Have a social place in the library where we put newspapers, magazines etc. for people to share and socialise	5	4	3	2	1
5	Have a culture to create and share new knowledge through one to one meetings and/or group meetings	5	4	3	2	1
6	Develop network outside the library to library management	5	4	3	2	1
7	Find new strategies and opportunities inside the library	5	4	3	2	1
<b>Q 15 (b) Externalisation (conversion of tacit knowledge into explicit knowledge)</b>						
1	Develop and disseminate brochures, leaflets and posters	5	4	3	2	1
2	Engage in library various groups and become among the members in library committees/ taskforce etc.	5	4	3	2	1
3	Participate in writing and documenting minutes in a meeting	5	4	3	2	1
4	Exchange ideas and opinions with colleagues	5	4	3	2	1
5	Collect knowledge from inside the library such as manuals and reports	5	4	3	2	1
6	Collect knowledge from outside the library such as policies/strategies	5	4	3	2	1
7	Participating in conducting current awareness services e.g. putting newly acquired information, putting new materials on shelves etc.	5	4	3	2	1
<b>Q 15 (c) Combination (creating explicit knowledge from explicit knowledge)</b>						
1	Facilitate acquisition and integration of knowledge e.g. cataloguing, classification, update of websites etc.	5	4	3	2	1
2	Participate in strategic planning and operations by using published literature, research proposals etc.	5	4	3	2	1
3	Participate in writing guidelines, reports, literature, policies/strategies etc. on library services	5	4	3	2	1
4	Develop and create training materials and disseminate them to library users	5	4	3	2	1
5	Collect external knowledge such as manuals/reports/ policies/strategies from inside the library	5	4	3	2	1
6	Create databases of knowledge and services	5	4	3	2	1
<b>Q 15 (d) Internalisation (conversion of explicit knowledge into tacit knowledge)</b>						
1	Participate in learning and training activities within the library/institution	5	4	3	2	1
2	Present papers in conferences	5	4	3	2	1
3	Participate in conducting a survey and share results with the entire library	5	4	3	2	1
4	Participate in research groups discussions	5	4	3	2	1
5	Asking questions during meetings or during presentations	5	4	3	2	1

6	Participate in selective dissemination of information e.g. sending new arrival to specific department/individual	5	4	3	2	1
---	--	---	---	---	---	---

### Access and use of Web 2.0 tools in academic libraries

Q 17	Are you aware of Web 2.0 tools? Please <b>mark the appropriate response</b>						
1	Yes	2	No	3	I do not know		
Q 18	Have you ever used any of the Web 2.0 tools? <b>Please mark the appropriate response</b>						
1	Yes	2	No				
Q 19	If your answer above (Q 18) is yes, please tick those Web 2.0 tools you have used or which you are currently using. <b>Please mark the appropriate one(s)</b>						
1	Facebook	6	Twitter	11	RSS Feeds	16	Google Drive
2	YouTube	7	LinkedIn	12	Podcasts	17	Dropbox
3	MySpace	8	Second Life	13	Flickr	18	Skype
4	Google+	9	Blogs	14	Library Thing	19	What sup
5	CiteULike	10	Delicious	15	Wikis	20	Slide Share
Q 20	Does your library have a website? <b>Please mark the appropriate response</b>						
1	Yes	2	No				
Q 21	If Yes, in (Q20) above, have you ever used the library website? <b>Please mark the appropriate response</b>						
1	Yes	2	No				
Q 22	Does your library use Web 2.0 tools? <b>Please mark the appropriate response</b>						
1	Yes	2	No	3	Not sure		
Q 23	How often do you use your library website?						
1	Once in a while			2	Monthly		
3	Weekly			4	Daily		
Q 24	What are uses of Web 2.0 tools in academic libraries?						
1				6			
2				7			
3				8			
4				9			
5				10			



### Application of Web 2.0 tools to enhance KM practices in academic libraries

Q 25	Have you used web 2.0 tools for KM practices? <b>Please mark the appropriate answer</b>					
1	Yes	2	No			
Q 26	If Yes in (Q25) above, how do you apply Web 2.0 tools to enhance KM practices within academic libraries? <b>Please circle the appropriate answer for each of the following statements using the criteria below: 1-strongly disagree; 2-disagree; 3-neutral/undecided; 4-agree; 5-strongly agree</b>					
<b>Q 26 (a) Socialisation (creating new knowledge through shared experiences)</b>						
1	Participating in group discussion in web 2.0 environment e.g. Face book and blogs	5	4	3	2	1
2	Communicating through VoIP or phone through web 2.0 technologies e.g. Google talk, Skype etc.	5	4	3	2	1
3	Writing and sharing knowledge e.g.by using Skype and blogs	5	4	3	2	1
4	Sharing methods, understanding, experience and skills through web 2.0 tools e.g. Wikis and Skype	5	4	3	2	1
<b>Q 26 (b) Externalisation (conversion of tacit knowledge into explicit knowledge)</b>						
1	Organising knowledge and provide a note through Tagging	5	4	3	2	1
2	Recording and watching knowledge discussion through web 2.0 tools e.g. YouTube	5	4	3	2	1
3	Writing and sharing knowledge e.g.by using Skype and Blogs, Wikis	5	4	3	2	1
4	Capturing personal knowledge through web 2.0 tools e.g. Blogs	5	4	3	2	1
<b>Q 26 (c) Combination (creating explicit knowledge from explicit knowledge)</b>						
1	Sharing knowledge resources through RSS feeds	5	4	3	2	1
2	Making up content through mashups (i.e. combining more than one web 2.0 tools e.g. blogs and Google Drive)	5	4	3	2	1
3	Managing collaboratively tags through Folksonomies	5	4	3	2	1
<b>Q 26 (d) Internalisation (conversion of explicit knowledge into tacit knowledge)</b>						
1	Learning by doing through content editor and co-development	5	4	3	2	1
2	Reflecting web 2.0 content on strategy implement through sharing of best practices	5	4	3	2	1
3	Receiving users' feedback through interaction between users	5	4	3	2	1
Q 27	Please select Web 2.0 tools categories which could be employed to enhance KM practices in academic libraries?					
1	Social networking (e.g. Facebook, Twitter and MySpace)	7	Image sharing (e.g. Picasa and Flickr)			

2	Authoring tools (e.g. Blogs, Wikis, Content sharing and Content Management System)	8	Audio sharing (e.g. Podcasts)
3	Personal Networks (e.g. LinkedIn, Academia and Xing)	9	Interpersonal tools (e.g. Meebo, Apple iChat, Google Talk and Skype)
4	Productivity applications (RSS Feeds and Tagging)	10	Sharing Sites (SlideShare, Dropbox and GoogleDocs)
5	Social bookmarking (e.g. Google Bookmarks, Delicious and CiteULike)	11	Mashups (e.g. LibraryThing and Google Maps)
6	Video and audio sharing (e.g. YouTube and BBC Player)	12	Virtual worlds (e.g. Second Life and World of Warcraft)

### Factors that affect the application of Web 2.0 tools to enhance KM practices

<b>Q 28</b>	What are the factors which could be integrated to facilitate the application of web 2.0 tools to enhance KM practices within academic libraries? <b>Please circle the appropriate answer for each of the following statements using the criteria below: 1= I do not know/no opinion; 2= least important; 3=less important; 4= important; 5= very important</b>					
<b>Q 28 (a) System quality</b>						
1	Web 2.0 tools are easy to use (Usability)	5	4	3	2	1
2	Web 2.0 tools are easy to learn and adapt (adaptability)	5	4	3	2	1
3	Web 2.0 tools are flexible (flexibility)	5	4	3	2	1
4	Web 2.0 tools are stable (stability)	5	4	3	2	1
5	Web 2.0 tools are easy to access (accessibility)	5	4	3	2	1
6	Web 2.0 tools are reliable (reliability)	5	4	3	2	1
<b>Q 28 (b) Knowledge quality</b>						
1	Web 2.0 tools provide accurate knowledge for managing library services (accuracy)	5	4	3	2	1
2	Web 2.0 tools provide reliable knowledge for managing library services (reliable)	5	4	3	2	1
3	Web 2.0 tools provide relevant knowledge for managing library services (relevance)	5	4	3	2	1
4	Web 2.0 tools provide knowledge which is easy to understand (easiness)	5	4	3	2	1
5	Web 2.0 tools provide complete set of content for managing library services (completeness)	5	4	3	2	1
6	Web 2.0 tools provide detailed knowledge	5	4	3	2	1
7	Web 2.0 tools provide up to date knowledge for managing library services	5	4	3	2	1

<b>Q 28 (c) Service quality</b>						
1	Web 2.0 tools within the library provide prompt support (responsiveness) to users	5	4	3	2	1
2	Users within Web 2.0 tools can easily access their knowledge needs (content/scope and timeliness).	5	4	3	2	1
3	Library provides reliable internet connection to use Web 2.0 tools	5	4	3	2	1
4	Guidelines are available for me to use Web 2.0 tools effectively for KM practices	5	4	3	2	1
5	Web 2.0 tools inspire trust and confidence (assurance) to users.	5	4	3	2	1
6	Library provides reliable technical support personnel	5	4	3	2	1
7	Web 2.0 tools provide what is promised (reliability).	5	4	3	2	1
<b>Q28 (d) Intention to reuse the system</b>						
1	I will use Web 2.0 tools to help me make decisions	5	4	3	2	1
2	I will use Web 2.0 tools to help me record my knowledge	5	4	3	2	1
3	I will use Web 2.0 tools to communicate knowledge with colleagues	5	4	3	2	1
4	I will Web 2.0 tools to share my knowledge	5	4	3	2	1
5	I will use Web 2.0 tools to create my specific knowledge	5	4	3	2	1
<b>Q 28 (e) User satisfaction</b>						
1	I am satisfied with Web 2.0 tools efficiency	5	4	3	2	1
2	I am satisfied with Web 2.0 tools effectiveness	5	4	3	2	1
3	I am satisfied that Web 2.0 tools meet my knowledge processing needs	5	4	3	2	1
4	I am enjoying using Web 2.0 tools (enjoyment)	5	4	3	2	1
5	I am satisfied with Web 2.0 tools adequacy	5	4	3	2	1
<b>Q 28 (f) Net benefits)</b>						
1	Web 2.0 tools help me to acquire new knowledge and innovative ideas	5	4	3	2	1
2	Web 2.0 tools help me effectively manage and store knowledge I need	5	4	3	2	1
3	Web 2.0 tools enable me to accomplish tasks more efficiently	5	4	3	2	1
4	My performance on the job is enhanced by web 2.0 tools	5	4	3	2	1
5	Web 2.0 tools improve the quality of my work life	5	4	3	2	1

**Challenges that hinder the application of Web 2.0 tools to enhance knowledge management practices in academic libraries**

Q 29	What are challenges which hinder KM practices within academic libraries? <b>Please circle the appropriate answer for each of the following statements using the criteria below: 1-strongly disagree; 2-disagree;</b>
------	--

		<b>3-neutral/undecided; 4-agree; 5-strongly agree</b>				
1	Lack of management support	5	4	3	2	1
2	Lack of time	5	4	3	2	1
3	Inadequate resources	5	4	3	2	1
4	Lack of policies and guidelines	5	4	3	2	1
5	Lack of motivations	5	4	3	2	1
6	Lack of skills and knowledge	5	4	3	2	1
7	Lack of awareness	5	4	3	2	1
Q 30	<b>What are challenges of applying and using web 2.0 tools within academic libraries? Please circle the appropriate answer for each of the following statements using the criteria below: 1-strongly disagree; 2-disagree; 3-neutral/undecided; 4-agree; 5-strongly agree</b>					
1	Learning new tools not given priority within most academic libraries	5	4	3	2	1
2	Inability to master technology – “same old excuse”	5	4	3	2	1
3	Poor ICT infrastructure to enhance the application and the use of web 2.0 tools	5	4	3	2	1
4	Lack of awareness of the values of the usage of web 2.0 tools especially in academic activities	5	4	3	2	1
5	Unstable internet connection	5	4	3	2	1
6	Ignorance	5	4	3	2	1
7	Lack of reliable power sources	5	4	3	2	1
8	Lack of security	5	4	3	2	1

**Recommendations towards the application of web 2.0 tools to enhance knowledge management practices**

Q 31	<b>What measures are necessary to resolve the challenges that hinder the application of web 2.0 tools to enhance KM practices in academic libraries?</b>				
1					
2					
3					

**Thank you for your cooperation**

### **APPENDIX 3: Interview Protocol**

Time of interview:.....

Date:.....

Interviewee's position: .....

Description of project: Application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania.

Questions:

1. What is KM practice?
2. Does your library apply any KM practices? If Yes, are there any KM policies and guidelines that help to guide or to establish KM in your institution?
3. What benefits arise from the application of KM practices in academic libraries?
4. Are you aware of the existence of any KM enablers in your library? if Yes, what are they, and are they effective in the implementation of KM? How? (Probe: organisational culture, management support, trusts etc).
5. How do you create and share knowledge in your library through the application of SECI processes? (Probe: socialisation, externalisation, combination and internalisation)
6. How do you access and use Web 2.0 tools for innovative service delivery in your library?
7. How do you use Web 2.0 tools categories to enhance KM practices in your library? (social networking sites (Facebook) and authorising tools (Blogs) etc);
8. How do you create and share knowledge through the application of SECI processes and Web 2.0 tools? (use of Web 2.0 tools Driven SECI Model – the combination of SECI Model and Web 2.0 tools);
9. What are the challenges which hinder the application of Web 2.0 tools to enhance KM practices in your library?

#### APPENDIX 4: Observation checklist

No	Activities to be observed
1	<p>KM practices application:</p> <ul style="list-style-type: none"> <li>• KM benefits: KM policy in place, KM repositories, Arrangement of library materials, research and innovation based on KM practices and so on</li> </ul>
2	<p>The existence of KM enablers</p> <ul style="list-style-type: none"> <li>• KM policy;</li> <li>• Organisational culture which supports KM practices;</li> <li>• IT facilities and support in the academic libraries visited (printers, computers, internet connectivity, standby generators/solar power etc);</li> <li>• Trust among library staff, library users and the management;</li> <li>• Management support in terms of sending employees for training, sufficient budget, appreciation for employees who participated in the application of Web 2.0 tools to enhance KM practices (e.g. letter of appreciation, promotion etc)</li> </ul>
3	<p>SECI processes for knowledge creation and sharing practices</p> <ul style="list-style-type: none"> <li>• Socialisation –sharing experiences among library staff, availability of special rooms for social communication among library staff etc.</li> <li>• Externalisation – availability of brochures and posters which explain libraries activities and availability of CAS, departmental meeting and meeting with stakeholders;</li> <li>• Combination - participation of library staff in strategic planning preparation, availability of databases, availability of various library reports written by library staff etc</li> <li>• Internalisation – teaching and learning activities, SDI practices, attendance at various conferences and workshops.</li> </ul>
4	<p>The access and use of Web 2.0 tools</p>

	<ul style="list-style-type: none"> <li>• The existence of Website in academic libraries;</li> <li>• The availability of Web 2.0 tools in academic libraries;</li> <li>• The uses of Web 2.0 tools in the academic libraries:</li> </ul>
5	<p>The application of Web 2.0 tools to enhance KM practices</p> <ul style="list-style-type: none"> <li>• Availability of various categories of Web 2.0 tools which enhance KM practices</li> <li>• The combination of SECI processes and Web 2.0 tools to enhance creation and sharing of knowledge (The application of Web 2.0 tools Driven SECI Model), for example: socialisation (participating in group discussion via Facebook and Blogs); externalisation (recording and watching knowledge discussion through YouTube); combination (making up content through mashups), and internalisation (receiving users feedback through Facebook and Skype)</li> </ul>
6	<p>Challenges that hinder the application of Web 2.0 tools to enhance KM practices;</p> <ul style="list-style-type: none"> <li>• Absence of internet connectivity;</li> <li>• Lack of standby generators</li> <li>• Lack of IT support</li> <li>• Lack of backups etc</li> </ul>

**APPENDIX 5: Variables and items included in the questionnaire**

<b>Variables</b>	<b>Activities/question</b>	<b>Source</b>
Socialisation	Gather knowledge from various library activities such as staff meetings	Choi & Lee 2002; Lee & Choi 2003; Karim, Razi & Mohamed 2012; Nonaka <i>et al.</i> 1994; Razi & Karim 2011
	Share experiences and engage in dialogue with library staff and library users on various issues such as borrowing books, reference queries etc.	Choi & Lee 2002; Lee & Choi 2003; Karim, Razi & Mohamed 2012; Nonaka <i>et al.</i> 1994
	Interact and conduct departmental meeting with external experts in the field of library and information science	Al-Alawi, Al-Marzooqi & Mohammed 2007
	Have a social place in the library where we put newspapers, magazines etc. for people to share and socialize	Al-Alawi, Al-Marzooqi & Mohammed 2007; Martin-de-Castro <i>et al.</i> 2008
	Have a culture to create and share new knowledge through one to one meetings and/or group meetings	Self developed
	Develop network outside the library to library management	Al-Alawi, Al-Marzooqi & Mohammed 2007
	Find new strategies and opportunities inside the library	Lee & Choi 2003; Karim, Razi & Mohamed 2012; Nonaka <i>et al.</i> 1994
Externalisation	Develop and disseminate brochures, leaflets and posters	Choi & Lee 2002
	Engage in library various groups and become	Lee & Choi 2003; Karim, Razi



	among the members in library committees/ taskforce etc.	& Mohamed 2012; Razi & Karim 2011
	Participate in writing and documenting minutes in a meeting	Choi & Lee 2002; Schulze & Hoegl 2008
	Exchange ideas and opinions with colleagues	Al-Alawi, Al-Marzooqi & Mohammed 2007; Razi & Karim 2011
	Collect knowledge from inside the library such as manuals and reports	Choi & Lee 2002; Martin-de- Castro <i>et al.</i> 2008
	Collect knowledge from outside the library such as policies/strategies	Choi & Lee 2002; Martin-de- Castro <i>et al.</i> 2008
	Participating in conducting current awareness services e.g. putting new acquired information, putting new materials on shelves etc.	Self developed
Combination	Facilitate acquisition and integration of knowledge e.g. cataloguing, classification, update of websites etc.	Self developed
	Participate in strategic planning and operations by using published literature, research proposals etc.	Karim, Razi & Mohamed 2012; Nonaka <i>et al.</i> 1994
	Participate in writing guidelines, reports, literatures, policies/strategies etc. on library services	Choi and Lee 2002; Nonaka <i>et</i> <i>al.</i> 1994; Razi & Karim 2011; Rice & Rice 2005
	Develop and create training materials and disseminate them to library users.	Lee & Choi 2003; Razi & Karim 2011

	Collect external knowledge such as manuals/reports/ policies/strategies from inside the library	Karim, Razi & Mohamed 2012; Nonaka <i>et al.</i> 1994; Schulze & Hoegl 2008
	Create databases on knowledge and services	Karim, Razi & Mohamed 2012; Razi & Karim 2011
Internalisation	Participate in learning and training activities within the library/institution	Self developed
	Present papers in conferences	Al-Alawi, Al-Marzooqi & Mohammed 2007; Nonaka <i>et al.</i> 1994
	Participate in conducting a survey and share results with the entire library	Karim, Razi & Mohamed 2012
	Participate in research groups discussions	Self developed
	Asking questions during meetings or during presentations	Nonaka <i>et al.</i> 1994
	Participate in selective dissemination of information e.g. sending new arrival to specific department/individual	Self developed
Service quality	Web 2.0 tools within the library provide prompt support (responsiveness) to users	Gorla, Somers & Wong 2010; Lwoga 2013; Masrek, Jamaludin & Mukhtar 2010
	Users within Web 2.0 tools can easily access their knowledge needs (content/scope and timeliness).	Lwoga 2013
	Library provides reliable internet connection to use Web 2.0 tools	Self developed
	Guidelines are available for me to use Web 2.0 tools effectively for KM practices	Self developed
	Web 2.0 tools inspire trust and confidence (assurance) to users.	Gorla, Somers & Wong 2010; Lwoga 2013; Masrek, Jamaludin & Mukhtar 2010;
	Library provides reliable technical support personnel	Lwoga & Questier 2014
	Web 2.0 tools provide what is promised	Gorla, Somers & Wong 2010;

	(reliability).	Lwoga 2013; Masrek, Jamaludin & Mukhtar 2010
Knowledge quality	Web 2.0 tools provide accurate knowledge for managing library services(accuracy)	Self-developed
	Web 2.0 tools provide reliable knowledge for managing library services (reliable)	Self-developed
	Web 2.0 tools provide relevant knowledge for managing library services (relevance)	Petter <i>et al.</i> 2008
	Web 2.0 tools provide knowledge which easy to understand (easiness)	Self-developed
	Web 2.0 tools provide complete set of content for managing library services (completeness)	Self-developed
	Web 2.0 tools provide detailed knowledge	Self-developed
	Web 2.0 tools provide up to date knowledge for managing library services	Self-developed
System quality	Web 2.0 tools are easy to use (Usability)	Lwoga 2013; Petter <i>et al.</i> 2008
	Web 2.0 tools are easy to learn and adapt (adaptability)	Lwoga 2013
	Web 2.0 tools are flexible (flexibility)	Gorla, Somers & Wong 2010; Petter <i>et al.</i> 2008
	Web 2.0 tools are stable (stability)	Lwoga 2013
	Web 2.0 tools are easy to access (accessibility)	Alshibly 2011
	Web 2.0 tools are reliable (reliability)	Lwoga 2013; Masrek, Jamaludin & Mukhtar 2010
Intention to reuse	I will use Web 2.0 tools to help me make decisions	Wu & Wang 2006;
	I will use Web 2.0 tools to help me record my knowledge	Wu & Wang 2006;
	I will use Web 2.0 tools to communicate knowledge with colleagues	Wu & Wang 2006;
	I will Web 2.0 tools to share my knowledge	Wu & Wang 2006;
	I will use Web 2.0 tools to create my specific knowledge	Wu & Wang 2006;

User satisfaction	I am satisfied with Web 2.0 tools efficiency	Lwoga 2013; Wu & Wang 2006;
	I am satisfied with Web 2.0 tools effectiveness	Wu & Wang 2006;
	I am satisfied that Web 2.0 tools meet my knowledge processing needs	Self developed
	I am enjoying using Web 2.0 tools (enjoyment)	
	I am satisfied with Web 2.0 tools adequacy	Masrek, Jamaludin & Mukhtar 2010;
Net benefits	Web 2.0 tools help me to acquire new knowledge and innovative ideas	Self developed
	Web 2.0 tools help me effectively manage and store knowledge I need	Self developed
	Web 2.0 tools enable me to accomplish tasks more efficiently	Alshibly 2011; Tansley <i>et al.</i> 2011
	My performance on the job is enhanced by web 2.0 tools	Alshibly 2011; Tansley <i>et al.</i> 2011
	Web 2.0 tools improve the quality of my work life	Alshibly 2011; Tansley <i>et al.</i> 2011

## APPENDIX 6: Acceptance letter of data collection from ARU

### ARDHI UNIVERSITY

Telephone: (255-022) - 2771272,  
2775004, 2772291/2  
Fax: (255-022) - 2775448, 2775479  
Telegrams: ARDHICHUO



P. O. Box 35176  
Dar Es Salaam  
e-mail: [aru@aru.ac.tz](mailto:aru@aru.ac.tz)  
website:  
<http://www.aru.ac.tz>

REF.NO ARU/AD.105/SF4/68

15<sup>th</sup> July, 2015

The Nelson Mandela African Institution of  
Science and Technology (NM-AIST)  
P. O. Box 447  
**Arusha**

**RE: INTRODUCTION OF MS. NEEMA FLORANCE MOSHA.**

Reference is made to your letter dated 10<sup>th</sup> June, 2015 with above heading.

Please be informed that your request for Ms. Neema to do her research and collect information at ARU Library for the completion of her PhD studies has been granted.

Student will be required to report to the Office of the Director Library Services on the date she reports for her indicated in your letter.

A handwritten signature in blue ink, appearing to read 'Salakana A. R.', is written over a blue circular stamp.

Salakana A. R.

**For: Deputy Vice Chancellor,  
Planning, Finance and Administration**

**For Deputy Vice Chancellor  
Planning, Finance and Administration  
Ardu University  
P. O. Box 35176  
Dar es Salaam**

**APPENDIX 7: Acceptance letter of data collection from MUHAS**

**MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED  
SCIENCES**

**DIRECTORATE OF LIBRARY SERVICES**

P.O. BOX 65012  
DAR ES SALAAM  
TANZANIA.



Tel: +255-22-2151162 Ext: 1115  
Telefax: +255-22-2151162.  
E-mail: [library@muhas.ac.tz](mailto:library@muhas.ac.tz)

Website: <http://www.muhas.ac.tz>

To,  
Neema Florence Masha,  
NM-AIST Library,  
P. O. Box 447,  
ARUSHA.

8<sup>th</sup> July, 2015

**REF: PERMISSION TO COLLECT DATA AT THE MUHIMBILI UNIVERSITY OF  
HEALTH AND ALLIED SCIENCES LIBRARY**

Refer to your letter of the above subject dated 10<sup>th</sup> June, 2015.

Your request for collecting data here at the Muhimbili University of Health and Allied Sciences Library has been approved.

Yours Sincerely,

Dr. Edda Jandi Lwoga  
Director,  
Directorate of Library Services,  
MUHAS

**DIRECTOR**  
*Directorate of Library Services*  
MUHIMBILI UNIVERSITY OF HEALTH  
& ALLIED SCIENCES (MUHAS)  
P.O. BOX 65012, DAR ES SALAAM

## APPENDIX 8: Acceptance letter of data collection from MU



E-mail: [mu@mzumbe.ac.tz](mailto:mu@mzumbe.ac.tz)  
Tel: +255 023 2604380/1/3/4  
Fax: +255 023 2604382  
Cell: +255 0754 694029  
Website: [www.mzumbe.ac.tz](http://www.mzumbe.ac.tz)

P.O. BOX 1,  
MZUMBE  
MOROGORO, TANZANIA

REF. NO. MU/OF/R.2/1/VOL. II/56

DATE: 23<sup>rd</sup> June, 2015

Neema Florence Masha,  
NM-AIST Library,  
P.O. Box 447,  
**ARUSHA.**

**RE: PERMISSION TO COLLECT DATA AT MZUMBE UNIVERSITY LIBRARY**

We acknowledge receipt of your letter of 10<sup>th</sup> June, 2015 with the above subject.

This serves to inform you that permission is granted to you to collect data at our University in order to complete your PhD studies.

On reporting date, let you meet the Director of Human Resource and Administration who will then direct you to the right place.

Your cooperation is highly appreciated.

  
S.M. Mutagurwa  
For: **VICE CHANCELLOR**

MZUMBE UNIVERSITY  
P. O. Box 1, MZUMBE  
TANZANIA

**APPENDIX 9: Acceptance letter of data collection from UDSM**

**UNIVERSITY OF DAR ES SALAAM**

**DIRECTORATE OF RESEARCH**

*P.O. Box 35091 ■ DAR ES SALAAM ■ TANZANIA*

**General Line:** 2410500-8 Ext. 2084

**Direct Line:** 2410727

**Website:** [www.udsm.ac.tz](http://www.udsm.ac.tz)



**Fax:** 255 022 2410743

255 022 2410023

**E-mail:** [research@udsm.ac.tz](mailto:research@udsm.ac.tz)

Our Ref. AB3/31

7<sup>th</sup> August 2015

Director,  
Willbard Chagula University Library  
**University of Dar es Salaam**

**RE: RESEARCH CLEARANCE**

This is to introduce **Ms. Neema Florence Masha** who is a student at the Nelson Mandela African Institution of Science and Technology, Tanzania. Ms. Masha is at the moment conducting data collection as part of her PhD studies. The title of her research is "**Application of web 2.0 Tools to Enhance Knowledge Management Practices in Academic Libraries in Tanzania**".

This is to request you to grant the above- mentioned student any help that may enable her to achieve her study objectives. The period for which this permission has been granted is from **August to September 2015**.

A handwritten signature in blue ink, appearing to read 'S. Masha'.

Prof. S. Masha

**DIRECTOR OF RESEARCH**

cc: Vice Chancellor  
cc: DVC- Academic  
cc: DVC- Administration  
cc: DVC – Research

---

*UDSM is an 'Equal-Opportunity' Institution of Higher Learning*



## APPENDIX 10: Acceptance letter of data collection from UDOM



### THE UNIVERSITY OF DODOMA LIBRARY SERVICES

P.O. BOX 259  
DODOMA, TANZANIA  
TE. +255 23 23002 FAX: 255 23 23000

08<sup>th</sup> August, 2015

To: Ms. Neema Florence Mosha  
Nelson Mandela African Institute  
of Science and Technology  
P. O. Box 447  
Arusha - Tanzania.

**Re: PERMISSION TO CONDUCT RESEARCH TO THE UNIVERSITY LIBRARY**

Reference is kindly made to your letter of 2015 on the above subject.

This is to inform you that, your request have been approved. You are welcomed in the University of Dodoma.

Sincerely,

Dr. R. J. Kinyella  
Director of Library Services



Cc: Heads, College Libraries.

## APPENDIX 11: Acceptance letter of data collection from SUA



### SOKOINE UNIVERSITY OF AGRICULTURE

OFFICE OF THE DEPUTY VICE CHANCELLOR  
(ADMINISTRATION AND FINANCE)  
P.O. BOX 3000, CHUO KIKUU, MOROGORO, TANZANIA  
TELEPHONE: +255 023 260 3511-4, D'neco: +255 023 260 4653,  
FAX: +255 023 260 4573,  
E-mail: [dvcadminfin@suanet.ac.tz](mailto:dvcadminfin@suanet.ac.tz)

Ref. No. SUA/ADM/R.1/8 VOL/4

Date: 30<sup>th</sup> July, 2015

TO WHOM IT MAY CONCERN  
SOKOINE UNIVERSITY OF AGRICULTURE

**RE: UNIVERSITY STAFF, STUDENTS AND RESEARCHERS CLEARANCE**

The Sokoine University of Agriculture was established by Universities Act No.7 of 2005 and SUA Charter of 2007 which became operational on 1<sup>st</sup> January 2007 repealing Act No.6 of 1984. One of the mission objectives of the University is to generate and apply knowledge through research. For this reason the staff, students and researchers undertake research activities from time to time.

To facilitate the research function, the Vice-Chancellor of the Sokoine University of Agriculture (SUA) is empowered under the provisions of SUA Charter to issue research clearance to lecturers, staff, students and researchers of SUA.

The purpose of this letter is to introduce to you **Miss Neema Florence Masha** a bonafide staff of NM - AIST and occasional student No.5077246 registered for a **PhD** in the University of South Africa (Unisa). By this letter **Miss Neema Florence** has been granted clearance to enable her achieve his research objectives. Specifically we request your permission for her to meet and talk to the leaders and other relevant stakeholders in your Faculty/Department in connection with his research. The title of the research in question is "**Application of web 2.0 tools to enhance knowledge Management Practices in Academic Libraries in Tanzania**".

The period for which this permission has been granted is from 1<sup>st</sup> August, 2015 to 31<sup>st</sup> August 2015 and the research will cover **Sokoine University of Agriculture**.

Should some of these areas/institutions/offices be restricted, you are requested to kindly advise the researcher(s) on alternative areas/institutions/offices which could be visited. In case you may require further information on the researcher please contact me.

We thank you in advance for your cooperation and facilitation of this research activity.

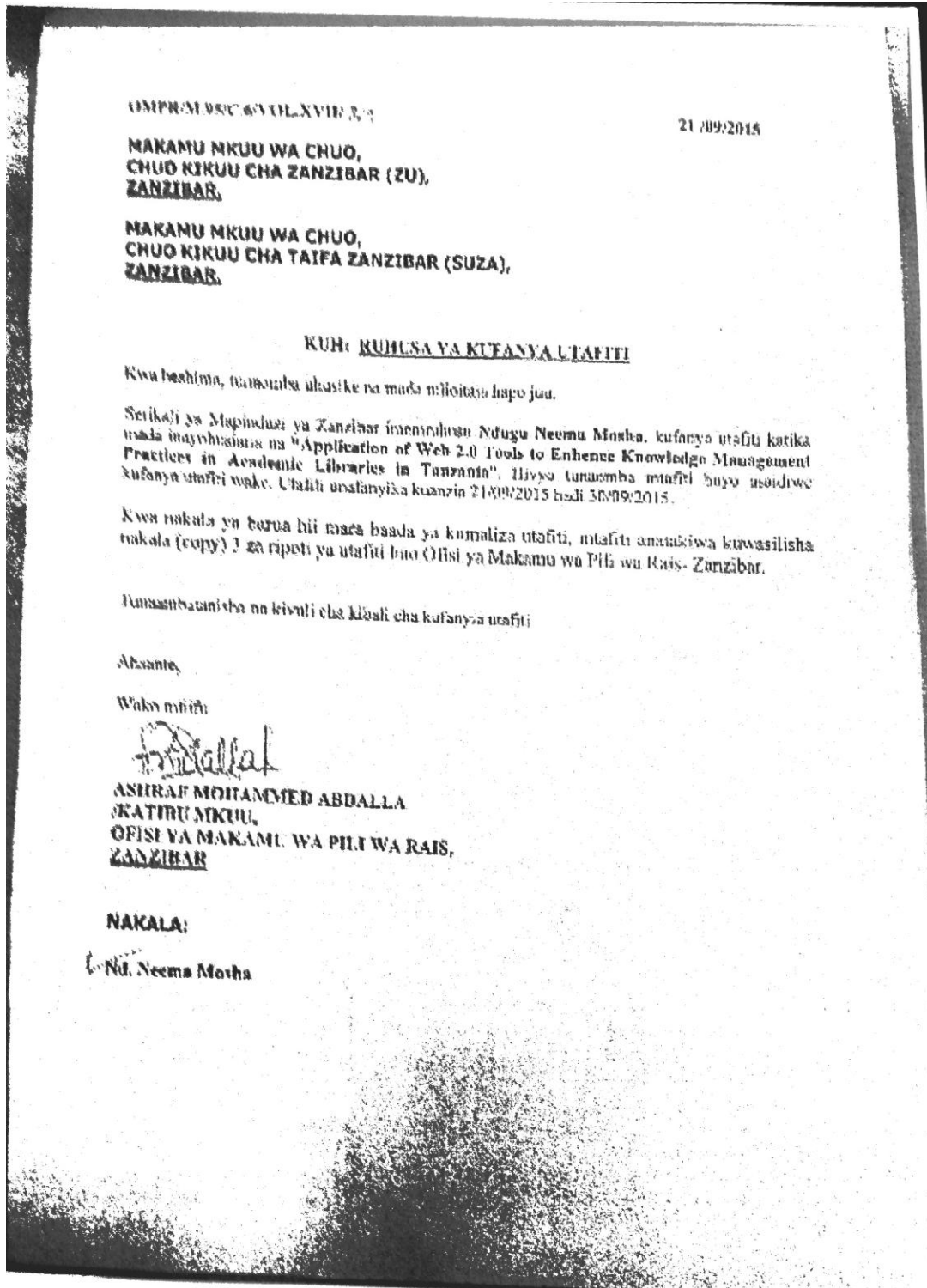
Yours sincerely,

Handwritten signature of Prof. Y. M. Ngaga.

Prof. Y. M. Ngaga  
**DEPUTY VICE CHANCELLOR**  
**(ADMINISTRATION AND FINANCE)**

Copy to: Student – **Miss Neema Florence Masha**

APPENDIX 12: Acceptance letter of data collection from SUZA



**APPENDIX 13: Ethical clearance from UNISA**



MEMO

Date: 02 June 2015

To: To whom it may concern

From: Prof GV Jiyane  
Chair: Research Committee  
Department of Information Science  
University of South Africa

Dear Sir/Madam

**Re: Ethical clearance: Neema Florence Mosha (student no. 5077246)**

This serves to confirm that Ms N F Mosha, student number no. 5077246, is a registered student for a Doctor of Information Science qualification at the Department of Information Science, University of South Africa (Unisa), South Africa. Her study entitled "APPLICATION OF WEB " 2.0 TOOLS TO ENHANCE KNOWLEDGE MANAGEMENT PRACTICES IN ACADEMIC LIBRARIES IN TANZANIA" has been ethically cleared by the University of South Africa and therefore Ms Mosha has been permitted to continue with her study, including conducting the field work.

I hereby wish to request your approval to necessitate data collection process in order for the candidate to complete the qualification in time.

Your support in this endeavour will be highly appreciated.

Sincerely yours,

.....  
Prof GV Jiyane  
Chair: Research Committee  
Dept of Information Science

Date 02.06.2015

.....  
Prof L Dube  
Coordinator: M & D  
Dept: Information Science

Date 02/06/2015

.....  
Prof OB Onyancha  
Chair  
Dept: Information Science

Date 02/06/2015