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Knowledge Management Use of the Web 2.0-Driven SECI Model to Improve Knowledge Creation and Sharing Practices in Selected Academic Libraries in Tanzania

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Abstract

Rationale of Study – The evolution of academic libraries is influenced by technological developments, including Web 2.0. Based on a larger PhD project, this study evaluated how selected academic libraries in Tanzania leverage a Web 2.0-driven SECI model to enhance knowledge creation and sharing processes.

Methodology – A convergent mixed methods research design was used to collect quantitative and qualitative data. The study investigated library staff (n=306) using a survey questionnaire, with a rate of return of 254 (83%). Eight library directors and sixteen heads of library departments were also interviewed to supplement data from the survey and establish convergence or divergence of the findings.

Findings – Many library staff (91.7%) used Web 2.0 tools several times daily for personal and professional use. They used Web 2.0 applications for various tasks, including online communication and knowledge sharing, teaching information literacy, and marketing and promoting library services and resources. The findings also show that knowledge creation and sharing practices were performed under each SECI model process.

Implications – Since its purpose is to improve the processes of creating and sharing knowledge, the Web 2.0 -driven SECI model can be utilised to integrate knowledge management practices through the creation and sharing of knowledge to support academic libraries and library professionals in managing their daily activities.

Originality – A limited number of studies have used the model in such a context, especially in higher learning and research institutions.

Keywords

Web 2.0 tools, Web 2.0-driven SECI model, knowledge creation, knowledge sharing, academic libraries, Tanzania

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1 Introduction and Background

Knowledge creation and sharing practices have been acknowledged as the most valuable assets for the growth of any organisation. Knowledge creation involves searching for new knowledge and/or replacing the current knowledge (Chen, 2008; Daland, 2016). Knowledge sharing concerns distributing and communicating knowledge to a wider audience to create new knowledge (Mosha, 2017; Rajendra & Gopalaswamy, 2011; Sondari et al., 2016; Xue et al., 2011). Knowledge sharing contributes to knowledge growth and productivity when individuals share or acquire knowledge from other organisation members (Ahmed & Noor, 2021; Castaneda & Cuellar, 2020; Xue et al., 2011; Ziegler, 2022). Knowledge creation and sharing practices also improve service quality (Castaneda & Cuellar, 2020; Dul et al., 2011; Koloniari et al., 2019; Nguyen & Mohamed, 2011), enhance efficiency and continuity (Kwanya, 2019), and achievement of organisational competitive advantage through the successful exploitation of internal and external knowledge (Hislop, 2013; Nonaka & Takeuchi, 1995; Prado & Marzal, 2013). That can reduce costs by eliminating redundant processes (Castaneda & Cuellar, 2020; Maiga, 2017; Wen, 2005).

Knowledge creation and sharing processes can also benefit organisations like academic libraries. Academic libraries are the main knowledge organisers in most academic organisations (Koloniari et al., 2019; Mosha, 2017). Implementing knowledge creation and sharing practices can enhance their impact on service delivery. The knowledge creation theory of Nonaka and Takeuchi (1995) provides one of the frameworks that can be used to exploit an organisation's knowledge resources effectively. Such knowledge can either be explicit or tacit. Explicit knowledge is contained in written documents such as books, articles, historical documents, conference proceedings and research articles, while tacit knowledge is embedded in people's minds and difficult to share (Farnese et al., 2019; Hislop, 2013).

The knowledge creation theory that is the socialisation, externalisation, combination and internalisation (SECI) model (Hislop, 2013; Nonaka, 1994; Nonaka & Takeuchi, 1995) offers a framework for enhancing knowledge management (KM) practices in organisations (Farnese et al., 2019; Karim et al., 2012; Trusson et al., 2014), including academic institutions (Lwoga, 2014; Mosha, 2017). According to the SECI model, knowledge is created through a continuous dialogue between tacit and explicit knowledge (Nonaka, 1994; Nonaka & Takeuchi, 1995; Sondari et al., 2016; Koloniari et al., 2019). In

other words, creating knowledge involves converting tacit knowledge into explicit knowledge and vice versa. (Ahmad & Karim, 2019; Nonaka & Konno, 1998).

The emergence of Web 2.0 tools enables academic libraries to easily create and share knowledge (Pirshahid, Naghshineh & Fahimnia, 2016; Mosha, 2017; Ziegler, 2022). Web 2.0 tools as information and communication technologies (ICTs) collaborative platforms can foster knowledge creation and sharing within an organisation (Ohei & Brink, 2019). Indeed, “Web 2.0 has changed the way people interact with each other, search, share, and create knowledge” (Ziegler, 2022, p. 1). Recently, researchers have been focusing on how to incorporate the Web 2.0 tools into the SECI model to address the learning process and how to harness and apply Web 2.0 concepts to create new learning experiences and learn across communities, and they came up with a Web 2.0-driven SECI model (Chatti et al., 2007; Shang et al., 2011). The combination of the SECI model and Web 2.0 tools can be used to enhance knowledge creation and sharing practices (Chatti et al., 2007; Hosseini, 2011; Shang et al., 2011). The present study uses the Web 2.0-driven SECI model to examine its uses to improve knowledge creation and sharing practices in academic libraries since effective learning models need to provide ecologies that foster creativity and provide people with support for collaborative knowledge creation.

The application of Web 2.0 tools in academic libraries

Academic libraries have long recognised the value of Web 2.0 tools for online participation, sharing, engagement, communication, and collaboration, as well as knowledge creation and sharing (Kim & Abbas, 2010; King, Duke-Williams & Mottershead, 2009; Kulakli & Mahony, 2014; Penzhorn & Piennar, 2009; Mosha, Holmner & Penzhorn, 2015). Academic libraries were among the early adopters of Web 2.0 tools (Lwoga, 2014; Woldofa, 2014). The application of Web 2.0 technologies in libraries can also be termed “Library 2.0” (Casey & Savastinuk, 2006; Casey & Stephens, 2005; Habib, 2006). They encourage synchronous social interactions between librarians and users (Aqil, Ahmad & Siddique, 2011; Lwoga, 2014). Web 2.0 and Library 2.0 can be used interchangeably in most cases. However, in this study, Web 2.0 tools are used.

Web 2.0 refers to a collection of modern technologies such as blogs, wikis, Site Really Simple Syndication Feeds, Social networks and LinkedIn (Kwanya, 2019; Kwanya, Stilwell & Underwood, 2010; O'Reilly, 2005; Anderson, 2006; Ayu & Abrizah, 2011; Mosha, Holmner & Penzhorn, 2015; Chew et al., 2020), that enable users to add, share and edit the content to create a socially networked web environment (Anderson, 2006;

Lwoga, 2014; Penzhorn & Pienaar, 2009). Kulakli and Mahony (2014, p. 648) called them “innovative communication platforms”. The emergence of Web 2.0 tools enables academic libraries to reach their customers wherever they are (Mosha, Holmner & Penzhorn, 2015), provide their services online (Aqil, Ahmad & Siddique, 2011; Kulakli & Mahony, 2014; Mosha, 2017; Ziegler, 2022) and enhance knowledge creation and sharing practices (King, Duke-Williams & Mottershead, 2009; Kulakli & Mahony, 2014; Mosha, 2017; Ziegler, 2022). Kwanya et al. (2014) add that Web 2.0 can also be viewed as a tool for communication, education, and social networking because it encourages sharing and teamwork in a virtual community setting.

There are various Web 2.0 tools to be applied in academic libraries settings, including social networking sites (Facebook, Myspace, Google+); professional networks (LinkedIn, Academia, Xing); researchers’ networks (Research Gate, The Science Network, Library20, Webjunction); and microblogging sites (Twitter); authoring tools (Blogs, Wikis, content management system and content sharing); sharing sites (Slideshare, Google Docs, Dropbox); productivity applications (RSS Feeds); 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 (Bosch, 2009; Lwoga, 2013; 2014; Penzhorn, 2013; Mosha, Holmner & Penzhorn, 2015; Mosha, 2017). These innovative platforms enable people to share their thoughts and experiences to support the creation and sharing of knowledge in academic libraries (Kulakli & Mahony, 2014).

For example, Virtual Communities of Practice (VCoPs) are among the Web 2.0 tools for knowledge sharing (Ziegler, 2022) that involve groups of people coming together in an innovative way to create and share knowledge (King, Duke-Williams & Mottershead, 2009). Individuals, as well as groups, can also create knowledge using Web 2.0 tools and encourage other people to share their views and recommend areas for improvement as a part of learning activities (Sondari, Tjakraatmadja & Bangun, 2016; Koloniari, Vraimaki & Fassoulis, 2019; Ziegler, 2022). In addition, Web 2.0 tools such as blogs and microblogging, wikis, discussion boards, and Messenger® facilitate contribution and participation. In contrast, Zoom and Facebook presentations and podcasts foster networking and participating in knowledge creation and sharing practices (King, Duke-Williams & Mottershead, 2009). These technologies have emerged to assist online activities within organisations. It is necessary to ensure that Web 2.0 tools are completely

used, whether by using them alone or integrating them with other models, frameworks, and ideas such as SECI.

Web 2.0-driven SECI model

The Web 2.0-driven SECI model combined Web 2.0 tools and the SECI/knowledge creation model (Nonaka, 1991; Nonaka & Takeuchi, 1995). The web 2.0-driven SECI model was developed by Chatti et al. (2007). Web 2.0-driven SECI model employed four spirals of knowledge conversion to enhance knowledge creation and sharing practices (Chatti et al., 2007; Mosha, 2017). The integration of the concepts of Web 2.0 with Nonaka's SECI model opened new doors for more personal, dynamic, and social learning on a global scale (Shang et al., 2011). The model enables knowledge creation and sharing in academic libraries (Mosha, 2017; Ziegler, 2022). They may employ the model to fit the virtual users and enhance institutional learning, teaching and research activities (Bamigbola, 2021; Mosha, 2017; Ziegler, 2022).

The use of the SECI model alone could limit the application of Web 2.0 tools to enhance knowledge creation (Bamigbola, 2021; Hosseini, 2011); and provide more room for online collaborative learning teaching-learning. Various Web 2.0 tools are available in each SECI process to enhance knowledge creation and sharing (Chatti et al., 2007). Furthermore, Web 2.0 technologies provide a platform for users to exchange knowledge, express thoughts and reconfigure existing explicit knowledge (Shang et al., 2011). Because of this, Web 2.0 tools provide a special way to efficiently capture high-quality and context-rich knowledge as it is created with the least amount of work (Chatti et al., 2007; Shang et al., 2011). For example, Web 2.0 tools effectively capture and publish knowledge in various ways and various media, such as pictures, video and audio recording (Penzhorn & Piennar, 2009; Akeriwa, Penzhorn & Holmner, 2015). Due to their applicability to SECI processes, Web 2.0 tools can be utilised for various tasks, such as sharing experiences, presenting papers, and collecting user information (Chatti et al., 2007; Shang et al., 2011).

The integration of Web 2.0 tools into SECI processes

Many Web 2.0 applications can accommodate processes in the SECI model. The significant difference is that Web 2.0 applications enable processes to be performed online. One of the advantages of utilising the Web 2.0-driven SECI model is to minimise physical meetings among people to create and share knowledge within an organisation (Mosha, 2017). Using various Web 2.0 tools such as Facebook, Twitter, Blogs, RSS

Feeds, Voice over Internet Protocol (VoIP), e-mails, Tagging, Phone/Video-Conferencing and Instant messaging enhances dialogues and discussions that enable individuals to share and exchange ideas (Hislop, 2013; Kulakli & Mahony, 2014; Shang et al., 2011; Ziegler, 2022); and combine and remix knowledge to form new knowledge which can then be shared using other Web 2.0 tools (Hislop, 2013; Ziegler, 2022). This can support the socialisation and externalisation processes in the SECI model (Shang et al., 2011).

With the application of Web 2.0 tools, explicit concepts from tacit knowledge are developed through several modes of representation, including spoken or written words, images, video, and music (Shang et al., 2011). For instance, RSS Feeds, blogs, and Facebook can be used to create awareness of new materials and resources in the library (Chatti et al., 2007; Mosha, 2017), and blogs provide a space for capturing and distributing personal knowledge (Hislop, 2013; Mosha, 2017). Within the combination process, Web 2.0 tools such as blogs and Wikis facilitate quick and wide knowledge dissemination across institutions (Hislop, 2013). For example, RSS Feeds, Tagging and Folksonomies facilitate knowledge sharing across networks (Chatti et al., 2007; Shang et al., 2011). Furthermore, Web 2.0 functionalities, such as content editing and co-development, provide platforms for knowledge creation among participants (Penzhorn & Piennar, 2009; Penzhorn, 2013; Mosha, Holmner & Penzhorn, 2015).

2 Statement of Research Problem

Knowledge creation and sharing practices are among the daily practices in academic libraries. Thus, an online model to address knowledge creation and sharing practices in academic libraries can enhance these activities (Ahmed & Noor, 2021; Ajie, 2019; Dewey, 2015; Endende, Kwasira & Makhama, 2022; Mosha, Holmner & Penzhorn, 2015; Sondari, Tjakraatmadja & Bangun, 2016). However, little is known about how academic libraries in Tanzania utilise such platforms to improve knowledge creation and sharing practices in the Web 2.0-driven SECI model. Maiga (2017) evaluated knowledge sharing among academics in Tanzanian universities and suggested using Web 2.0 tools as one of the knowledge-sharing tactics. However, the study left it up to future researchers to determine whether these tools can be used for knowledge-sharing practices. Understanding how academic libraries use the Web 2.0-driven SECI model for knowledge creation and sharing effectively has implications for professional practice (Chatti et al., 2007; Shang et al., 2011). Academic librarians in the selected higher learning

institutions (HLIs) can use this study to explore how they can enhance the creation and sharing of knowledge by integrating the SECI model processes and Web 2.0 tools. The specific objectives that inform the study were to:

1. Assess the prevalence of ownership and use of Web 2.0 tools for knowledge creation and sharing.
2. Establish the application of Web 2.0 tools in academic libraries for knowledge creation and sharing.
3. Identify knowledge creation and sharing practices performed under each SECI process using the Web 2.0-driven SECI model.
4. Determine factors that hinder the utilisation of the Web 2.0-driven SECI model from enhancing knowledge creation and sharing practices.

3 Research Methodology

This study employed a convergent mixed research design (also referred to as the convergent parallel mixed research design) (Creswell & Plano-Clark, 2017). Convergent design enables researchers to collect qualitative and quantitative data simultaneously, analyse them separately and compare the results to draw overall conclusions (Creswell & Plano-Clark, 2017; Ngulube, 2022). As Ngulube (2022) suggested, quantitative and qualitative data were collected concurrently, analysed separately, and integrated at the interpretation stage. The main aim of using a convergent study design was to tap into the quantitative results and qualitative findings to establish convergence or divergence of views of the respondents and participants. It also enabled the collected qualitative and quantitative data to comprehensively understand the phenomenon (Fetters, Curry & Creswell, 2013; Ngulube, 2022). In this study, quantitative data was collected from library staff, while qualitative data was collected from library directors and heads of library departments.

The study purposely selected eight academic libraries in public HLIs from different regions of Tanzania, namely the University of Dar-es-Salaam (UDSM) Library, Muhimbili University of Health and Allied Sciences (MUHAS) Library, Open University of Tanzania (OUT) Library, Ardhi University (ARU) Library, Sokoine National Agriculture Library (SNAL), Mzumbe University (MU), University of Dodoma (UDOM) Library and the State University of Zanzibar (SUZA) Library. The study population

involved library staff, directors, and heads of library departments from the selected academic libraries.

The academic libraries were purposely selected based on the established criteria: existence as an academic library for at least ten years, well-developed ICTs facilities and infrastructure to accommodate Web 2.0 tools and other online services, a well-equipped and functional library, and an updated website. On the other hand, a stratified random sampling technique was used to select library staff to participate in this study. The online sample size calculator was used to calculate the sample size for library staff from each library (Creative Research Systems, 2003). The margin error was $\pm 2.5\%$, resulting in a sample size of 278 library staff. Ten per cent of the sample size was added to account for non-responses, giving the sample size 306. Library directors and heads of library departments were purposely selected, and eight and sixteen heads of library departments were interviewed. The relationship between the two samples was parallel in line with mixed methods research sampling (Ngulube, 2022; Onwuegbuzie & Collins, 2007).

A survey questionnaire was administered to 306 library staff from the selected academic libraries. An unstructured interview guide was used to collect data from library directors and heads of library departments. A list of all library staff was obtained from the human resources office at each university where the library was located. Respondents were selected according to the proportional probability size of the library. Quantitative data capturing, cleaning and analysis were performed using Statistical Package for the Social Sciences (SPSS) software Version 21. Descriptive statistics of respondents were summarised using frequency and percentages for categorical variables. Braun and Clarke (2006) recommended that qualitative data be analysed thematically.

The University of South Africa (UNISA) granted ethical approval for the study. The specific academic library granted permission to collect data from academic libraries in Tanzania. The researchers visited each academic library, introduced the study to the respondents and provided them with the study information and consent form to sign to express willingness to participate voluntarily in this study.

4 Research Findings

Demographic information of respondents

A survey questionnaire was distributed to 306 library staff from the selected academic libraries, with a return rate of 254 (83%). 129 (50.8%) respondents were male, and 119 (46.9%) were middle-aged, between 21 and 30. On the other hand, one library director

and two heads of library departments from each academic library were interviewed. Thus, a total of 8 library directors and 16 heads of library departments were interviewed. Table 1 illustrates the demographic information of respondents.

Table 1: Demographic information of respondents (N=254)

Item(s)	Categories	Frequency	Percentage
Gender	Male	129	50.8
	Female	125	49.2
Age (in years)	21-30	119	46.9
	31-40	100	39.4
	41-50	27	10.6
	51-60	8	3.1
Library	ARU	18	7.1
	OUT	20	7.9
	MUHAS	15	15.9
	MU	40	12.7
	SNAL	31	15
	SUZA	14	5.5
	UDSM	71	28.0
	UDOM	45	17.7

Ownership and use of Web 2.0 technologies

The study findings indicated that most respondents owned and used different Web 2.0 tools. 233 (91.7%) respondents had a Facebook account for personal use and work activities. Figure 1 presents different types of Web 2.0 tools accounts owned and used by respondents.

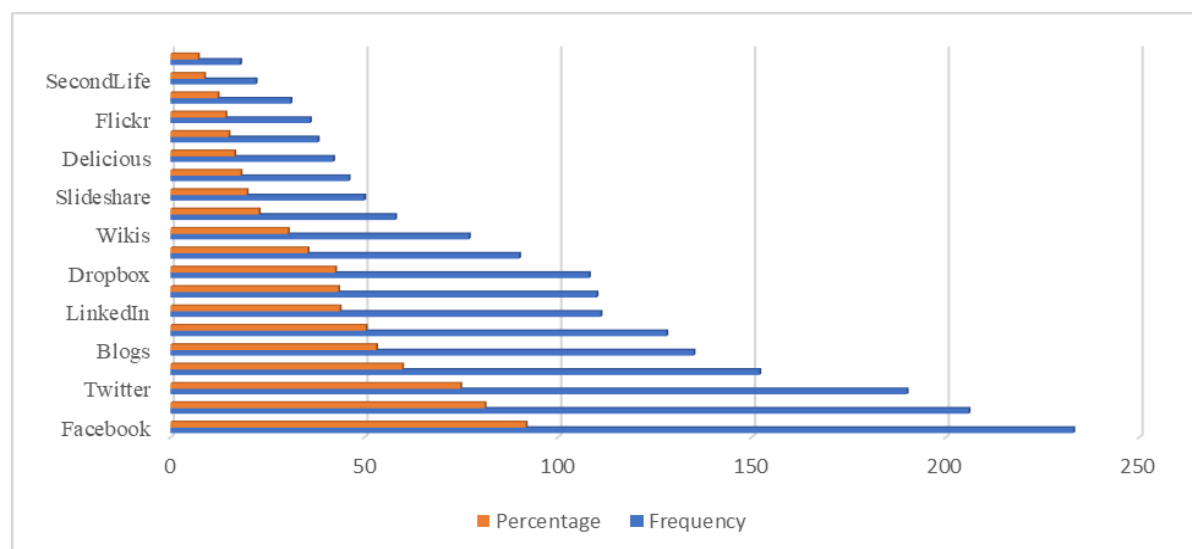


Figure 1: Web 2.0 tools' accounts owned and used by respondents

Interviews findings revealed the usage of Web 2.0 tools for knowledge creation and sharing practices, as reported by one participant:

I am using Web 2.0 tools to create knowledge and share it with my colleagues at work [SNAL 1].

They also reported using these tools for personal and work-related activities as reported that:

I am using Facebook to assist library users in posting new arrivals and communicating with my family [SUZA 1].

Another participant reported that:

I am using Web 2.0 tools for chatting, sending videos and photos to my friends, and official communications, especially during training and meetings [SUZA 1].

They also reported to professional Web 2.0 tools such as LinkedIn and Academia.edu for academic works such as research and teaching.

The application of Web 2.0 tools in academic libraries

Respondents were asked to mention various applications of Web 2.0 tools in their libraries, focusing on creating and sharing knowledge. 202 (79.5%) respondents mentioned enhancing online communication and sharing knowledge. Figure 2 presents various applications of Web 2.0 in academic libraries.

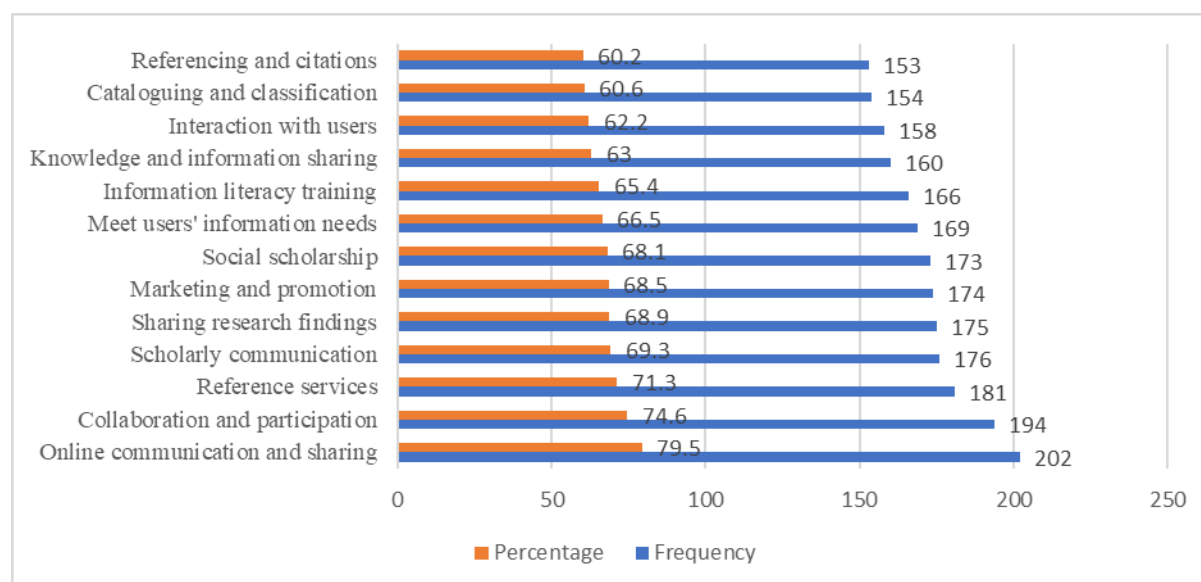


Figure 2: Web 2.0 tools enhance knowledge creation and sharing practices

Interviewers mentioned several applications of Web 2.0 tools, including facilitating knowledge creation and sharing practices, enhancing participation in different library

activities, facilitating information literacy programmes, and marketing and promoting library resources and services. Three participants added the following on creation and sharing knowledge using Web 2.0 as follows:

Web 2.0 tools such as YouTube are very important in enhancing knowledge creation and sharing practices because people can watch how others create and share knowledge and therefore be motivated to utilise YouTube for sharing knowledge among others [SNAL 2].

And

We use Facebook for promotional purposes and for sharing knowledge within the library [SNAL 3].

And

Web 2.0 tools such as Facebook and Twitter can facilitate knowledge creation and sharing practices within academic communities by connecting people within their departments and institution, and to enhance the individual search for related knowledge for the department or the institution and provide links which assist individuals in retrieving, access and use information [MU 1].

Other responses on the application of Web 2.0 tools in academic libraries were as follows:

We use Wikis to support and train library users on information literacy programmes such as accessing, retrieving and using library information resources. We also use Facebook and Blogs to promote library activities and resources [UDSM 1].

And

We are using Blogs to deliver health content, post announcements such as conferences and training, and market and promote library services such as new arrivals. In our library, Facebook is used to communicate socially and academically with our users [MUHAS 1].

One participant recommended that:

Through Web 2.0 tools, librarians can create individual profiles and invite others to contribute; this can help individuals know who knows what and therefore put such information for other users to update their understanding of the information [MU 2].

Knowledge creation and sharing practices performed under each SECI process

The study has employed the Web 2.0-driven SECI model to address various knowledge creation and sharing practices performed by library staff under each SECI process.

Socialisation process

213 (84%) respondents reported participating in group discussions. Table 2 presents knowledge creation and sharing practices under the socialisation process.

Table 2: Knowledge creation and sharing practices under the socialisation process

Knowledge creation and sharing practices	Yes N (%)	No N (%)
Sharing methods, understanding, experience and skills via Google Talk	191 (75%)	63 (25%)
Communicating using Facebook and WhatsApp	191 (75%)	63 (25%)
Sharing knowledge via Google Hangout	184 (72%)	70 (28%)
Group discussion via Google Talk and Facebook	213 (84%)	41 (16%)

Library directors and heads of departments were creating and sharing knowledge under the socialisation process through various Web 2.0 tools such as Google Talk, Google Hangout and Facebook. One participant reported that:

I normally conduct my meeting and discuss various issues concerning the library's progress using Google Talk [UDSM 2].

Externalisation process

A total of 198 (78%) respondents reported organising knowledge and providing a report. Table 3 presents knowledge creation and sharing practices under the externalisation process.

Table 3: Knowledge creation and sharing practices under the externalisation process

Knowledge creation and sharing practices	Yes N (%)	No N (%)
Capturing personal knowledge via Blogs	181 (71%)	73 (29%)
Writing and sharing knowledge via Wikis	190 (74%)	64 (26%)
Recording knowledge discussion via Google Talk	194 (76%)	60 (24%)
Organising knowledge and providing a report via Blogs	198 (78%)	56 (22%)

Findings from the interviews with library directors and heads of departments showed that knowledge creation and sharing knowledge were enhanced under the externalisation process by capturing personal knowledge from their co-workers when they reported back from training, meetings, and workshops and on writing and sharing reports using Blogs, Google Talk and Facebook. One participant reported that:

On my side, I am using Blogs to capture personal knowledge from my co-workers and library users [SUZA 2].

Combination process

A total of 179 (70%) respondents reported making content by combining more than one Web 2.0 tool. Table 4 presents knowledge creation and sharing practices under a combination process.

Table 4: Knowledge creation and sharing practices under combination process

Knowledge creation and sharing practices	Yes N (%)	No N (%)
Making content through the combination of more than one Web 2.0 tool via Blogs and Wikis	179 (70%)	75 (30%)
Managing collaborations via RSS Feeds	166 (65%)	88 (35%)
Sharing knowledge and experiences via Facebook	172 (68%)	82 (32%)

Results from the interviews reported that they were creating and sharing knowledge under the combination process through sharing ideas and experiences and creating content for library training and courses using RSS Feeds, Wikis and Blogs.

Internalisation process

A total of 203 (80%) respondents reported that they were reflecting on Web 2.0 content on strategies implemented through sharing of best practices. Table 5 presents knowledge creation and sharing practices under the internalisation process.

Table 5: Knowledge creation and sharing practices under the internalisation process

Knowledge creation and sharing practices	Yes N (%)	No N (%)
Receiving users' feedback through interaction via Google Talk	195 (77%)	59 (23%)
Reflecting Web 2.0 contents on strategies implemented through sharing of best practices via Blogs	203 (80 %)	64 (20 %)
Learning by doing through content editor and co-development using various Web 2.0 tools via Wikis	196 (79%)	58 (21%)

Data from library directors and heads of departments demonstrated that knowledge creation and sharing knowledge under the internalisation process were done by providing feedback to employees after attending meetings, workshops and seminars using RSS Feeds, Blogs, and Facebooks, and it was captured that:

We provide feedback after attending meetings, seminars, or workshops among staff. However, the final report is submitted to the management and registry for documentation using Blogs and Wikis [MUHAS 2].

Challenges that hinder knowledge creation and sharing using Web 2.0-driven SECI model

Further analysis provided various challenges that hinder using the Web 2.0-driven SECI model to enhance knowledge creation and sharing practices. A total of 232 (91%) respondents mentioned their difficulties with unstable internet connection and lack of ICT infrastructure. Table 6 presents various challenges mentioned by respondents.

Table 6: Challenges that hinder knowledge creation and sharing using the Web 2.0-driven SECI model

Challenges	Yes N (%)	No N (%)
Lack of awareness on how to utilise the Web 2.0-driven SECI model to enhance knowledge creation and sharing practices	230 (90%)	24 (10%)
Unstable internet connection	232 (91%)	22 (9%)
Lack of security and privacy	206 (81%)	48 (19%)
Inability to master technology – "same old excuse."	224 (88%)	30 (12 %)
Poor ICT infrastructure	232 (91%)	22 (9 %)
Lack of reliable power sources	227 (89%)	27 (11%)
Ignorance	207 (82%)	47 (18%)
Learning new tools not given priority	221 (87%)	33(13%)

Both library directors and heads of departments reported insufficient funds, ignorance, and lack of motivation as among the challenges that hinder knowledge creation and sharing using the Web 2.0-driven SECI model in academic libraries. Individual participants reported the following challenges:

Lack of time based on our daily activities could be a challenge, especially in using this tool for knowledge creation and sharing since most librarians know such tools [UDSM 3].

And

Web 2.0 tools such as Facebook and Blogs are strictly forbidden in our library; no one is allowed to use any of Web 2.0 tools for whatever purposes [OUT 1].

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 to enhance knowledge creation and sharing practices using the Web 2.0-driven SECI model [OUT 2].

5 Discussion of Findings

Web 2.0 has given academic libraries more alternative ways of providing services to their users, including allowing library staff to assist users wherever they are. The growth of knowledge creation and sharing activities is one outcome of using Web 2.0 tools in academic libraries. The study found that most library staff used at least one Web 2.0 tool. Most had Facebook and WhatsApp accounts for personal and professional use. This finding proved that Facebook is among the most useful Web 2.0 tools for personal and work issues. Other studies also supported this finding that most librarians registered to Facebook accounts for personal and work activities (Lwoga, 2013; Chitumbo, Eness & Chewe, 2015; Chewe et al., 2020; Rabatseta, Maluleka & Onyancha, 2021; Williams, 2020).

The study also discovered that Web 2.0 tools were used in various ways, including to enhance knowledge sharing and communication, support library activities, information literacy training, and marketing and promoting library resources and services. Xu, Ouyang and Chu (2009) found out that out of 81 academic libraries surveyed in New York State, only 34 (42%) were using Web 2.0 tools to improve library services and facilitate knowledge creation and sharing.

On the other hand, the current study found different activities to enhance knowledge creation and sharing practices under each SECI process using the Web 2.0-driven SECI model as follows: participating in group discussion, communicating with junior staff and conducting meetings using various Web 2.0 tools (socialisation process), organising knowledge and providing a report, and capturing personal knowledge from their co-workers (externalisation process), making content through the combination of more than one Web 2.0 tools, sharing knowledge and experiences as well as creating contents to library training (combination process), and reflecting on Web 2.0 content on strategies implemented through sharing of best practices and providing feedback to employees after attending meetings, workshops and seminars (internalisation process).

The Web 2.0-driven SECI model could support and improve knowledge creation and sharing practices in academic libraries without library staff physically meeting. It is also noted that some activities can be conducted in multiple processes depending on the situation and working environment. In supporting the finding above, studies indicate knowledge creation and sharing practices under each or more than one SECI process using various Web 2.0 tools as follows; sharing knowledge, experiences and

understanding under socialisation and combination processes using Google Talk and Skype (Mosha, 2017; Paroutis & Al Saleh, 2009; Shang et al., 2011), capturing personal knowledge and enhancing writing and sharing under externalisation, combination and internalisation processes facilitated by using Blogs, Wikis and Skype (Kulakli & Mahony, 2014; Paroutis & Al Saleh, 2009; Shang et al., 2011), and making up content via the use of Mashups (the combination of more than one Web 2.0 tool such as Blogs and Google Docs in the combination process (Shang et al., 2011; Ziegler, 2022). Web 2.0 functionalities such as content editing and co-development provide platforms for co-creation among respondents and enable knowledge internalisation through reflection on what has been learned (Shang et al., 2011; Ziegler, 2022). Folksonomies are used to manage collaboration (Shang et al., 2011) and RSS Feeds to facilitate knowledge creation and sharing practices (Shang et al., 2011), while Wikis and Blogs enable individuals to receive feedback on the knowledge they contributed (Kulakli & Mahony, 2014; Salajan & Mount, 2012; Paroutis & Al Saleh, 2009; Ziegler, 2022).

The study also found unstable internet connection, insufficient funds, ignorance among staff, a lack of ICT infrastructure and skills, and limited motivation by staff to use the Web 2.0-driven SECI model as some of the barriers to knowledge creation and sharing practices. Other studies highlighted similar findings (Akeriwa, Penzhorn & Holmner, 2015; Kwanya, Stilwell & Underwood, 2012; Lwoga, 2014; Makori, 2012; Penzhorn & Piennar, 2009). Munatsi (2010) found that library staff lacked relevant knowledge, competencies and skills to implement and utilise Web 2.0 tools for various library activities. Woldofa (2014) added that the challenges of using Web 2.0 in most African libraries include a lack of technical know-how. Muneja and Abungu (2012) provided that library staff and library users struggle to acquire skills for effectively utilising and using Web 2.0 tools for creating online catalogues, social bookmarking, collaborating, and sharing content. On the other hand, Raeth et al. (2010) recommended that the adoption and usage of Web 2.0 depend much on training, communication, and advocacy to create awareness of the usefulness of the tools.

6 Conclusion

The study examined using the Web 2.0-driven SECI model to enhance knowledge creation and sharing in academic libraries. The ownership and usage of Web 2.0 tools among library staff, library directors and heads of library departments were assessed, and it revealed that individuals could own more than one Web 2.0 account for personal and

work duties. Several applications of Web 2.0 tools in academic libraries were identified and discussed, and most focused on enhancing online communication, participation, collaboration and sharing of information and knowledge. The study identified and discussed several activities to enhance knowledge creation and sharing practices under each SECI model process using the Web 2.0-driven SECI model. Most of these activities focused on involving library staff using various Web 2.0 tools for online discussions, meetings, and feedback and exchanging and capturing ideas. The study also highlights challenges that hinder using the Web 2.0-driven SECI model to enhance knowledge creation and sharing practices in academic libraries. Therefore, there is a need for academic libraries to minimise these challenges to ensure proper implementation and the use of the Web 2.0-driven SECI model for effective knowledge creation and sharing practices.

7 Recommendations

1. Academic libraries should ensure the use of the Web 2.0-driven SECI model for effective knowledge creation and sharing practices.
2. Academic libraries should offer more personalised services via Web 2.0 technologies in a way that presents information and knowledge in a more familiar format to their users.
3. Academic libraries should go beyond Web 2.0 and start thinking about employing Web 3.0, which will enable such libraries to use technologies such as the semantic web, cloud computing, mobile devices and re-envisioning, and established technologies such as federated search to facilitate user-generated content and collaboration to promote and make their collections accessible.

8 Limitations

The present research focused exclusively on knowledge creation and sharing practices using the Web 2.0-driven SECI model among library staff from academic libraries located in public HLIs thus, the findings cannot be generalised to academic libraries in both public and private institutions. The barriers arising from using the Web 2.0-driven SECI model to enhance knowledge creation and sharing practices in academic libraries may serve as a basis for creating and sharing practices using other intervention tools and knowledge management systems and models.

The strength of this study was the application of convergent mixed-method research using survey questionnaires for library staff and semi-structured interviews for library directors and heads of departments, which provided more space for both groups to present their opinions, especially from library directors and heads of departments who are the decision-makers in the implementation of the model.

References

- Ahmad, F., & Karim, M. (2019). Impacts of knowledge sharing: A review and directions for future research. *Journal of Workplace Learning*, 31 (3), 207–230. <https://doi.org/10.1108/JWL-07-2018-0096>.
- Ahmed, B., & Noor, N.H.N.M. (2021). The practice of knowledge sharing in academic libraries: The annotation of previous research. *Journal of Information Systems and Digital Technologies*, 3(1), 1-15.
- Ajie, I. (2019). Issues and prospects of knowledge sharing in academic libraries. *Library Philosophy and Practice*, (e-journal). 2521. <https://digitalcommons.unl.edu/libphilprac/2521>.
- Akeriwa, M., Penzhorn, C., & Holmner, M. (2015). Using mobile technologies for social media-based library services at the University of Development Studies Library, Ghana. *Information Development*, 31 (3), 284–293. <https://doi.org/10.1177/0266666913515898>.
- Anderson, N. (2006). Tim Berners-Lee on Web 2.0: Nobody even knows what it means. <http://arstechnica.com/business/2006/09/7650/>.
- Aqil, M., Ahmad, P., & Siddique, A. (2011). Web 2.0 and libraries: Facts or myths. *DESIDOC Journal of Library and Information Technology*, 31 (5), 395–400. <https://doi.org/10.14429/djlit.31.5.1198>.
- Ayu, A. R., & Abrizah, A. (2011). Do you Facebook? Usage and applications of Facebook pages among academic libraries in Malaysia. *International Information and Library Review*. 43 (4), 239-249. <https://doi.org/10.1080/10572317.2011.10762906>.
- Bamigbola, A. A. (2021). Web 3.0 tools and knowledge conversion by distance learners. *Regional Journal of Information and Knowledge Management*, 6 (2), 21-35.
- Barker, R. (2015). Management of knowledge creation and sharing to create virtual knowledge-sharing communities: A tracking study. *Journal of Knowledge Management*, 19 (2), 334–350. <https://doi.org/10.1108/JKM-06-2014-0229>.
- Bosch, T. E. (2009). Using online social networking for teaching and learning: Facebook use at the University of Cape Town. *Communication*, 35 (2), 185–200. <https://doi.org/10.1080/02500160903250648>.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3 (2), pp. 77–101.
- Casey, M. E., & Savastinuk, L.C. (2006). Library 2.0 service for the next generation library. *Library Journal*, 131(14), 40 -42.
- Casey, M.E., & Stephens, C.M. (2005). Librarians without borders. *Library Journal*, 134 (12), 19–19.
- Castaneda, D. I., & Cuellar, S. (2020). Knowledge sharing and innovation: A systematic review. *Knowledge and Process Management*, 27, 159– 173. <https://doi.org/10.1002/kpm.1637>.
- Chatti, M. A., Klamma, R., Jarke, M., & Naeve, A. (2007, July 18). The Web 2.0-driven SECI model-based learning process. Paper presented at the 7th IEEE International Conference on Advanced Learning Technologies (ICALT), pp, 1–6. <https://doi.org/10.1109/ICALT.2007.256>.
- Chen, C. K. (2008). Causal modelling of a knowledge-based economy. *Management Decision*, 46 (3), 501–514.
- Chen, X. H., Snyman, M. M. M., & Sewdass, N. (2005). Interrelationship between document management, information management and knowledge management. *South African Journal of Information Management*, 7 (3), 1–10. <https://doi.org/10.4102/sajim.v7i3.270>.
- Chewe, P., Zulu, Z., Chitumbo, E.M., & Musonda, Y. (2020). Enhanced library services through social media in the age of covid-19 pandemic: An anecdote of academic libraries in Zambia. *Library Philosophy and Practice*. 4762. <https://digitalcommons.unl.edu/libphilprac/4762>

- Chitumbo, E. M. M., & Chewe, P. (2015). Social media tools for library service delivery in higher learning institutions: Case of University of Zambia and National Institute of Public Administration libraries Importer. *Research Journal of Library Sciences*, 3 (4), 1–7.
- Creative Research Systems (2003). Sample size calculator. <http://www.surveysystem-com/sscalc.htm>.
- Creswell, J.W. & Plano-Clark, V. (2017). *Designing and conducting mixed methods research* (3rded.). Sage publications.
- Daland, H. (2016). Managing knowledge in academic libraries, are we? Should we? *LIBER Quarterly*, 26 (1), 28–41. <https://doi.org/10.18352/lq.10154>.
- Dewey, B. I. (2015). Transforming knowledge creation: An action framework for library technology diversity. *Code for Library Journal*, pp. 28, 04–15.
- Dul, J., Ceylan, C., & Jaspers, F. (2011). Knowledge workers, creativity and the role of the physical work environment. *Human Resource Management*, 50 (6), 715–734.
- Endende, K.L., Kwasira, J., & Makhama, F. (2022). Knowledge creation practices and employee performance in selected public technical vocational education and training institutions in Kenya. *European Journal of Human Resource Management Studies*, 6(1): 1-20.
- Farnese, M.L., Barbier, B., Chirumbolo, A., & Patriotta, G. (2019). Making knowledge in organisations: A Nonaka's SECI model operationalisation. *Frontiers in Psychology*, 10 (2730), 1-15. <https://doi.org/10.3389/fpsyg.2019.02730>.
- Fetters, M. D., Curry, L. A., & Creswell, J. W. (2013). Achieving integration in mixed methods designs: Principles and practices. *Health Services Research*, 48 (6), 2134–2156. <https://doi.org/10.1111/1475-6773.12117>.
- Habib, M. (2006). *Towards academic Library 2.0: development and application of a library methodology*. Chapel Hill, NC, University of North Carolina.
- Hislop, D. (2013). *Knowledge management in organisations: A critical introduction* (3rd ed.). Oxford University Press.
- Hosseini, S. M. (2011). The application of the SECI model as a framework of knowledge creation in virtual learning. *Asia Pacific Education Review*, 12, 263–270. <https://doi.org/10.1007/s12564-010-9138-5>.
- Karim, N. S. A., Razi, M. J. M., & Mohamed, N. (2012). Measuring employee readiness for knowledge management using intention to be involved with KM SECI processes. *Business Process Management*, 18 (5), 1463–1514.
- Kim, Y., & 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. <https://doi.org/10.1016/j.acalib.2010.03.003>.
- King, T., Duke-Williams, E., & Mottershead, G. (2009). Learning and knowledge building with Web 2.0 technologies: Implications for teacher education. https://pur.port.ac.uk/ws/files/223029/Microsoft_Word_Majorca_Paper_V4.pdf.
- Koloniari, M., Vraimaki, E., & Fassoulis, K. (2019). Factors affecting knowledge creation in academic libraries. *Journal of Librarianship and Information Science*, 51 (1), 20–33. <https://doi.org/10.1177/0961000616668958>.
- Kulakli, A., & Mahony, S. (2014). Knowledge creation and sharing with Web 2.0 tools for teaching and learning roles in so-called University 2.0. *Procedia: Social and Behavioral Sciences*, 150, 648–657. <https://doi.org/10.1016/j.sbspro.2014.09.084>.
- Kwanya, T. (2019). A review of knowledge management education and training in Kenya. In T. Kwanya, J. Kiplang'at & J. Wamukoya (Eds.), *Emerging trends in information and knowledge management*. Moi University Press.
- Kwanya, T., Stilwell, C., & Underwood, P. (2010). Library 2.0 principles and Ranganathan fifth law. *Mousaion*, 28 (2), 1-16.
- Kwanya, T., Stilwell, C., & Underwood, P. (2012, June 4). The application of Web 2.0 tools by libraries in Kenya. Paper presented at the 27th Standing Conference of Eastern, Central and Southern African Library and Information Associations (SCECSAL), Laico Regency Hotel Nairobi, Kenya.
- Kwanya, T., Stilwell, C., & Underwood, P. (2014). *Library 3.0: Intelligent libraries and apomediation*. Chandos Publishing.
- Li, Z., & Zhu, T. (2009). An empirical study on the influence of social capital on informal knowledge transfer among individuals. *Journal of Software*, 4 (4), 291-298.

- Lin, H. F. (2011). Antecedents of the stage-based knowledge management evolution. *Journal of Knowledge Management*, 15 (1), 136–155. <https://doi.org/10.1108/13673271111108747>.
- Lwoga, E. T. (2013). Measuring the success of library 2.0 technologies in the African context: The suitability of the DeLone and McLean's model. *Campus-Wide Information Systems*, 30 (4), 288–307. <https://doi.org/10.1108/CWIS-02-2013-0011>.
- Lwoga, E. T. (2014). Integrating Web 2.0 into an academic library in Tanzania. *Electronic Library*, 32 (2), 183–202. <https://doi.org/10.1108/EL-06-2012-0058>.
- Maiga, Z.B. (2017). *Knowledge sharing among academics om selected universities in Tanzania: PhD Thesis in Information Studies*. University of KwaZulu Natal, Pietermaritzburg.
- Makori, E. O. (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. <https://doi.org/10.1108/00242531211207406>.
- Mosha, N. F. (2017). *Application of Web 2.0 tools to enhance knowledge management practices in academic libraries in Tanzania: PhD thesis*. University of South Africa (UNISA).
- Mosha, N.F., Holmner, M., & Penzhorn, C. (2015, August 11). 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 81st International Federation of Library Associations and Institutions (IFLA) - World Library and Information Conference (WLIC), Cape Town, South Africa.
- Munatsi, R. (2010, December 6). Implementation of Library 2.0 services in African academic and research libraries: Need for fundamental rethink. Paper presented at the 19th Standing Conference of Eastern, Central and Southern African Library and Information Associations (SCECSAL), University of Botswana, Gaborone.
- Muneja, P. & Abungu, A. (2012, June). Application of Web 2.0 tools in delivering library services : A case of selected libraries in Tanzania. Paper presented at the 27th Standing Conference of Eastern, Central and Southern African Library and Information Associations (SCECSAL), Laico Regency Hotel Nairobi, Kenya.
- Murugesan, S. (2007). Understanding Web 2.0. *IT Professional*, 9 (4), 34 - 41.
- <https://doi.org/10.1109/MITP.2007.78>Ngulube, P. (2022). Using simple and complex mixed methods research designs to understand research in Information Science. In P. Ngulube (Ed.). *Handbook of research on mixed methods research in information science* (pp. 20–44). IGI Global.
- Nguyen H. N., & Mohamed, S. (2011). Leadership behaviours, organisational culture and knowledge management practices: An empirical investigation. *Journal of Management Development*, 30 (2), 206–221.
- Nonaka, I. & Takeuchi, H. (1995). *The knowledge-creating company*. Oxford University Press.
- Nonaka, I. (1991). The knowledge-creating company. *Harvard Business Review*, pp. 69, 96–104.
- Nonaka, I. (1994). A dynamic theory of organisational knowledge creation. *Organization Science*, 5 (1), 14–37.
- Nonaka, I. von Krogh, G. & Voelpel, S. (2006). Organisational knowledge creation theory: Evolutionary paths and future advances. *Organization Studies*, 27 (8), 1179–1208.
- Nonaka, I., & Toyama, R. (2003). The knowledge-creation theory revisited: Knowledge creation as a synthesising process. *Knowledge Management Research and Practice*, 1 (1), 2–10.
- Nonaka, I., & Konno, N. (1998). The concept of 'ba': Building a foundation for knowledge creation. *California Management Review*, 40 (3), 40-54.
- Onwuegbuzie, A. J., & Collins, K. T. M. (2007). A typology of mixed methods sampling designs in social science research. *Qualitative Report*, 12(2), 281–316.
- O'Reilly, T. (2005). What is Web 2.0?: Design patterns and business models for the next generation of software. http://www.im.ethz.ch/education/HS08/OReilly_What_is_Web2_0.pdf.
- Ohei, K., & Brink, R. (2019). Web 3.0 and Web 2.0 technologies in higher education institute: methodological concept towards a framework development for adoption. *International Journal of Infonomics*, 12 (1), 1841–1853.
- Paroutis, S., & Al Saleh, A. (2009). Determinants of knowledge sharing using Web 2.0 technologies. *Journal of Knowledge Management*, 13 (4), 52-63. <https://doi.org/10.1108/1367320971824>.
- Penzhorn, C., & Piennar, H. (2009). The use of social networking tools for innovative service delivery at the University of Pretoria Library. *Innovation*, 38, 66–77. <https://doi.org/10.1016/j.jaac.2015.07.005>.

- Penzhorn, C. (2013). The use of social media in teaching a campus-wide information literacy course. *Mousaion*, 31 (3), 57–73.
- Pirshahid, S. E., Naghshineh, N. & Fahimnia, F. (2016). Knowledge and use of Web 2.0 by librarians in university libraries of East Azerbaijan, Iran. The *Electronic Library*, 34 (6), 1013–1030. <https://doi.org/10.1108/EL-10-2014-0192>.
- Prado, J. C., & Marzal, M. Á. (2013). Incorporating data literacy into information literacy programs: Core competencies and contents. *Libri*, 63 (2), 123–134. <https://doi.org/10.1515/libri-2013-0010>.
- Rabatseta, B., Maluleka, J. R. & Onyancha, O. B. (2021). Adoption and use of social media in academic libraries in South Africa. *South African Journal of Library and Information Science*, 87 (1), 20–31. <https://doi.org/10.7553/87-1-1926>.
- Raeth, P., Urbach, N., Smolnik, S., & Konigs, P. (2010, August 12). The adoption of Web 2.0 in corporations: A process perspective. Paper presented at the 16th Americas Conference on Information Systems (AMCIS), Lima, Peru.
- Rajendra, B. H., & Gopalaswamy, M. (2011). Use of Web 2.0 tools and technologies for science communication in biomedical sciences. *A special reference to blogs*, 3(5), 85–91.
- Salajan, F.D., & 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.
- Shang, S. S. C., Li, E., Wu, Y.-L., & Hou, O. (2011). Understanding Web 2.0 service models: A knowledge-creating perspective. *Information and Management*, 48 (4–5), pp. 178–184. <https://doi.org/10.1016/j.im.2011.01.005>.
- Sondari, M. C., Tjakraatmadja, J. H., & Bangun, Y. R. (2016). Research knowledge creation process in higher education: *A proposed framework*. *Advanced Science Letters*, 22 (5–6), 1269–1272. <https://doi.org/10.1166/asl.2016.6687>.
- Trusson, C. R., Doherty, N. F., & Hislop, D. (2014). Knowledge sharing using IT service management tools: Conflicting discourses and incompatible practices. *Information Systems Journal*, 24 (4), 347–371. <https://doi.org/10.1111/isj.12025>.
- Wen, S. (2005). Implementing knowledge management in academic libraries: A pragmatic approach: *Chinese Librarianship. An International Electronic Journal*, 6 (19), 1–10.
- Williams, M.L. (2020). The adoption of Web 2.0 technologies in academic libraries: A comparative exploration. *Journal of Librarianship and Information Science*, 52 (1), 137–149.
- Woldofa, K. (2014). Adoption of Web 2.0 in academic libraries of top African universities. *The Electronic Library*, 32 (2), 262–277.
- Xu, C., Ouyang, F., & Chu, H. (2009). The academic library meets Web 2.0: Applications and implications. *Journal of Academic Librarianship*, 35 (4), 324–331. <https://doi.org/10.1016/j.acalib.2009.04.003>.
- Xue, Y., Bradley, J., & Liang, H. (2011). Team climate, empowering leadership, and knowledge sharing. *Journal of Knowledge Management*, 15 (2), 299–312.
- Ziegler, M. G. (2022). Web 2.0 and Knowledge sharing: A literature review. *Artificial Intelligence, Computer Science and Robotics Technology*, 1–14. <https://doi.org/10.5772/acrt.03>.