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Mosha, Neema

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Neema Florence Mosha
Nelson Mandela African Institution of Science and Technology, neema.mosha@nm-aist.ac.tz

Marlene Holmner
University of Pretoria, marlene.holmner@up.ac.za

Utilisation of social media tools to enhance knowledge sharing among knowledge workers at the Nelson Mandela African Institution of Science and Technology (NM-AIST)

Neema Florence Mosha

Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha, Tanzania

and

Marlene Holmner

University of Pretoria (UP), Pretoria, South Africa

Abstract

This study investigated the utilisation of social media tools to enhance Knowledge Sharing (KS) practices among knowledge workers at The Nelson Mandela African Institution of Science and Technology (NM-AIST) of Tanzania. A case study design was used in this study. Data was collected by adopting a combination of document content analysis and semi-structured interviews from library and Information and Communication Technologies (ICT) staff. Data was analysed thematically. The study showed that social media tools can be implemented effectively according to institution goal, users' need and capacity building among knowledge workers. The findings also reviewed the strong commitment of the institution to ensure knowledge dissemination and exchange among its employees through the establishment of an electronic library, reliable internet connection, and having an ICT centre. This is a comprehensive study focusing on knowledge workers' ability and willingness in utilising social media tools for KS initiatives in Higher Learning Institutions (HLIs); and reveals findings that are useful for planning and implementing social media tools initiatives for KS in other HLIs in the country.

Keywords

Knowledge sharing (KS), social media tools, knowledge workers, library staff, Information and Communication Technologies (ICTs) personnel, Nelson Mandela African Institution of Science and Technology (NM-AIST).

Introduction

The advancement of social media tools has transformed the operation of information services and KS in HLIs. Social media includes online technological tools that enable people to communicate, participate, share and collaborate easily via the Internet (Sodt and Summey, 2009; Chua and Goh, 2010; Harinarayana and Raju, 2010; Kim and Abbas, 2010; Luo, 2010). Thus, social media tools enable HLIs to improve their services by enhancing communication with customers, promoting marketing strategies and imparting information literacy skills to users (Chua and Goh, 2010).

On the other hand, KS is a process of communicating, sharing and exchange information, ideas, views and experiences in order to solve problems, develop new ideas and implement policies and procedure manuals within institutions (Wang and Noe, 2010). Cheng, Ho and Lau (2009) add that "generally, sharing knowledge is about communicating knowledge within a group of people". In addition, Kuhlen (as cited in (Stranack, 2012) reports that, knowledge produced by a single author provides less meaning unless it can be communicated, shared and used as a collaborative process, involving multiple authors, knowledge sources and building upon past experiences and research in order to create new ideas and understandings.

KS provides a link between employees, where knowledge resides, and institutions, where knowledge attains its competitive value (Du, Ai and Ren, 2007; Hendriks, 1999; Jain, 2001). Most of the valuable knowledge is stored within the heads of employees (tacit knowledge) who are knowledge workers. Nonaka and Takeuchi (1995) state that "everyone has, to some extent, become a knowledge worker" Drucker (1993) also adds that "we live in a knowledge-driven world, which therefore makes the "knowledge worker" the most significant single asset". Knowledge originates from human experience and insight; thus, knowledge workers in HLIs create knowledge through teaching, learning, research and innovation; then share and use knowledge for the benefit of their institution (Hislop, 2013). HLIs, on the other hand, comprise several knowledge workers who are scattered in different schools and departments; therefore, the importance of knowing where such knowledge workers located, helps to explain why the concept of KS through the utilisation of social media tools has been developed and researched(Zaffar, 2012).

Several studies have looked at the application of social media tools to facilitated KS practices among knowledge workers, there is limited information in Africa and Tanzania in particular on how social media tools can be utilised to enhance KS practices among knowledge workers within HLIs (Hosseini and Hamshepour, 2012; Kim and Abbass, 2010; Lwoga, 2013; Paroutis and Saleh, 2009). Therefore, this study has investigated the extent to which social media tools could be utilised in enhancing KS at NM-AIST.

The implementation of social media tools at NM-AIST
The NM-AIST in Arusha, Tanzania is one in a network of African Institution of Science and Technologies (AISTs) which are being established in SSA (NM-AIST, 2009). The AISTs are tasked to train and develop the next generation of African scientists, engineers and technologists, who will impact on the continent's development through the application of science, engineering and technology. The NM-AIST is being created as an autonomous regional research-intensive university that caters for the Eastern African region of Sub-Sahara African (SSA) and is linked to the other AISTs in the network (NM-AIST, 2009). It has been employing a number of social media tools since its inception in 2012 to enhance online communication, participation,

collaborate and share information within and outside the institution. The institution, therefore, developed the following social media tools:

Social Networking Sites (SNS): In this category, Facebook was implemented to marketing and promote the institution activities. The NM-AIST Facebook page is still being promoted.

Wiki: Wiki is implemented to support learning and information literacy activities. The institution uses Wiki to provide online training modules in the form of powerpoint presentations on various information literacy aspects, including online search strategies, evidence-based practice, citation and reference management and use of Web 2.0 technologies.The Wiki was developed by using free hosting services provided by Google site.

Social bookmarking and tagging systems: These tools are used to organise and categorise web-based scholarly literature in Science, Technology and Engineering (SET) and share them as subject guides to students and staff via the institutional website.

RSS Feeds: The institution integrated RSS feeds on its website, blog and Facebook page to be instantly updating its users on new and useful information being added on the website or blog.

The role of social media tools to enhance knowledge sharing activities
Social media includes online technological tools that enable people to communicate, participate, share and collaborate easily via the Internet (Chua and Goh, 2010; Harinarayana and Raju, 2010; Jain, 2013; Kim and Abbas, 2010; Luo, 2010; Lwoga 2013; O'Reilly, 2005; Sodt and Summey, 2009). Social media tools enhance KS practices; however, the main success of KS lies in the hands of people(Gottschalk, 2005; Singh Sandhu, Jain and Ahmad, 2011). Many of the social media tools built on open-source therefore they can easily be integrated to enhance KS (McKenzie and Van Winkelen, 2011).Muneja and Abungu (2012) are of the opinion that "being freely open source and easy to adopt the tools can revolutionize provision of services and lead to rapid growth of knowledge acquisition". Being open, social media tools accepted among the reliable mechanism to enhance KS in HLIs. Gottschalk (2005)supports that social media tools have increased the potential for better dissemination of information and knowledge beyond its creator and also increased both technical and social connectivity within HLIs.

Social media tools provide a virtual space which inspires and facilitates formal interactions and processes of KS among knowledge workers (Hislop 2013; Schwartz, 2006). Social media tools like wikis and blogs are increasingly becoming popular for managing and sharing knowledge activities within HLIs (Zaffar, 2012; Penzhorn, 2013). Examples of categories of social media tools which support KS practices include: social networking sites such as *Facebook* and *LinkedIn* which enable bilateral flow of information, collaboration and effective communication among members (Ayiah and Kumah 2011; Kim and Abbas, 2010; Lwoga 2013)and *Really Simple Syndication (RSS)* which is useful for alerting and filtering information(Penzhorn, 2013; Schneckenberg, 2009; Penzhorn, 2013).

Methods

The methodology in this study was structured as described below:

Institution documents content analysis

Institution documents' contents reviewed to assess the utilisation of social media tools to enhance KS practices within the institution. Further a decision to conduct semi-structured interview was made since the available institution documents could not provide sufficient information needed for the development of social media tools to enhance KS within the institution.

Semi-structured interview

In the second phase, the semi-structured interview was conducted to determine actual user needs and expectations for the utilisation of social media tools to enhance KS practices. Semi-interview conducted to library and ICT staff. The library was selected because it stores various types of materials (printed and online) which provide information and knowledge to the entire NM-AIST community. The library also employed several social media tools to facilitate library activities including knowledge transfer and exchange. The ICT-RC was selected, because it deals with the integration and implementation of various social media tools within the institution, to ensure Internet connection within the institution, ensure information security and provision of enough bandwidth to facilitate ICT services within the institution.

Sampling and data analysis

The purposive non-probability sampling technique was used to select the respondents. Qualitative research works with small samples of people, cases or phenomena nested in particular contexts(Gray, 2009).Thus, the sample of six library staff and six information technology personnel who considered being 'information-rich' were thus selected in the study. The total number of participants in this study was twelve. Data were analysed by using emerging themes (thematic analysis). Thematic analysis is mostly applicable in qualitative studies and especially in case studies (Kombo and Tromp, 2006). Therefore, in this study, data was organised and presented according to the research sub-questions outlining the themes. Kombo and Tromp (2006) add that emerging themes refer to topics or major subjects which come up during discussions of the findings. These themes will be discussed in more detail in the following section.

Results

Results were obtained from both the interview and document content analysis. In this study twelve respondents were interviewed whereas six from the library and six from the ICT department. The study reviewed the following NM-AIST documents: NM-AIST library annual

report 2013 (NM-AIST, 2013a), NM-AIST Corporate Strategic Plan 2013-2027(NM-AIST, 2013b), NM-AIST ICT policy 2013(NM-AIST, 2013c), NM-AIST monitoring and evaluation report 2013 (NM-AIST, 2013d), andNM-AIST staff training and development manual 2013 (NM-AIST, 2013d).

Knowledge sharing at NM-AIST

The findings from NM-AIST Corporate Strategic Plan 2013-2027(NM-AIST, 2013b) indicated an initiative to ensure knowledge dissemination and exchange among NM-AIST's employees. Results showed that the institution supports and encourages KS practices among its knowledge workers. Majority of the respondents appreciated the fact that KS is an essential aspect to the fulfilment of the institution's vision, mission and values. Respondents reported to sharing knowledge during teaching, learning, research and innovation.

Respondents reported advantages of KS practices, which include: effective communication, timely decision making and for an institution to achieve its intended goals. Therefore, to facilitate KS at NM-AIST, the library plans to increase the collection of library materials, to train library users on various KSenablers and to improve the library's opening and closing hours.

Deployment of social media tools at NM-AIST

The NM-AIST has the basic ICT structure to support the integration and utilisation of social media tools within the institution. Results indicated in the ICT policy 2013 (NM-AIST, 2013c). On the other hand, electronic library was developed as well as the high-speed internet connection to ensure the accessibility of the information within the institution. Results indicated that in the NM-AIST Corporate Strategic Plan 2013-2027(NM-AIST, 2013b). On the other hand, respondents reported the existence of computers connected to the internet in their offices and their workplaces such as in classroom, server room, and library.

Face-to-face communication was reported as the dominant mechanism for KS by library respondents; while Google mail and Google Drive were reported by ICT-RC respondents. The study found out that, most respondents were using Facebook and WhatsApp for their personal communication such as: communicating, participating, collaborating and sharing information with friends and relatives. Few respondents reported using social media tools to enhance their daily professional duties such as providing feedback to library users and promoting and marketing various library services. Respondents agreed on the application of the following social media tools within the institution which includes:-

  (i)   ***Social networking tools:*** such as Facebook and MySpace to facilitate online communication and interactions.
 (ii)   ***Professional networks:*** such as LinkedIn to link people within and outside the institution and to enhance online collaboration, and to exchange and share professional information and knowledge.

(iii) *Wikis:* to enhance communication and sharing of information and people can be able to edit, comment and add updates to various posts/works posted.

(iv) *Social Tagging*: to tag various articles in order to be shared amongst members.

 (v) *Blogs:* to post and to read other posts respectively.

To ensure the integration and application of social media tools within the institution, ICT-RC respondents presented the following support: installation, training on the usage, and registration for the institution and for among users. The department also collaborates with the management in order to ensure all resources and facilities are available for the proper utilisation of social media tools.

Respondents were also asked to mention their major roles which their departments are playing in order to facilitate the utilisation of social media tools at NM-AIST. Library respondents reported to train both library staff and library users will be provided on how to join, register and use social media tools especially for those which provide direct links to the library. An example is on how to tag various articles. The library also committed to provide support and to facilitate the installation, uploading and utilising multiple social media tools. The library will also recommend types of social media tools which are very useful within HLIs. Library respondents reported to assist and sometimes to do the installation and registration of various social media tools which are implemented in the library. ICT-RC respondents reported that the ICT-RC can facilitate the utilisation of social media tools at NM-AIST by ensuring that, the institution secure enough bandwidth for internet connection and to make sure that, all IT equipment which stored within knowledge workers' offices are working correctly.

The utilisation of social media to enhance KS practices among knowledge workers
Respondents reported that there is no social media tool which is currently available or employed either to the library or to the ICT-RC to enhance KS practices. However, respondents agreed that social media tools are useful to enhance KS practices at the NM-AIST. Respondents mentioned various categories of social media tools which can be utilised to enhance KS practices which include: video/photos sharing tools (YouTube), social networking tools (Facebook), professional networks (LinkedIn and Academia.edu), Wikis, Tagging and Blogs. Respondents mentioned advantages of utilising social media tools to enhance KS practices at the NM-AIST which include the following:

 (i) *Online communication:* Social media tools can foster online communication among knowledge workers whereby each one can easily share contribute and add information.

 (ii) *Knowledge flow:* Social media tools can facilitate KS practices by allowing knowledge to flow online and reach many people who can easily share, comments and suggest in various issues.

(iii) *Social network:* Social media tools create social connection/network among people within a group, so that such group can easily communicate and share knowledge.

(iv)   *Up to date information:* Individual can post up to date information about a certain issue with social media such as Blogs, so that people can be attracted and start to contribute and share to the post and this leads to the creation of new knowledge and hence KS practices.

Challenges which prohibit knowledge workers in utilising social media tools to enhance KS practices at the NM-AIST

Respondents reported a number of challenges which hinder the utilisation of social media tools to enhance KS practices among knowledge workers at NM-AIST and in other HLIs in Tanzania and in other countries in Africa. In this study challenges were divided into three major groups: institutional challenges, technological challenges and individual challenges.

Institutional challenges

These are challenges which are caused by institutions or management in general. According to Sohail and Daud (2009), institutional challenges are challenges that are not derived from the individual personally and they can be environmental and may be caused by individuals which occupy a managerial position within the institution. Respondents reported various institutional challenges which hinder the utilisation of social media tools to enhance KS practices within HLIs. Respondents reported lack of HRM/institutional policies and practice which is also supported by Grace(2009) who states that lack of HRM and other institutional policies and practices to support the implementation and utilisation of social media tools in order to enhance KS practices is among the critical problem within institutions. Respondents also mentioned lack of KS strategies and focuses could also limit the utilisation of social media tools to enhance KS practices within KS. The argument was also supported by Riege(2005) who mentioned that the main reason why most companies do not reach their KS goals is the lack of a clear connection between KS strategy and usability of social media tools.

Respondents also mentioned the lack of rewards, recognition and incentives from the management as among the critical challenges. Inline to this, Wang and Noe (2010) add that lack of incentives including recognition and rewards have been identified among the major barriers to KS. Paroutis and Saleh (2009) report that, lack of motivational support and recognition from management prohibit knowledge workers from utilising social media tools to enhance KS practices. According to Hosseini and Hashempour (2012) and Variant and Puspitasari (2013) also reported lack of rewards such as money, training, attending seminars and conferences could prohibit workers to utilise social media tools to enhance KS practices.

Respondents mentioned the lack of organisational culture to support the utilisation of social media tools. Schneckenberg (2009) also mentioned lack of institutional culture to encourage knowledge workers to share information. Other challenges as mentioned in this category include budget constraints, lack of institutional structure, lack of institutional commitments to support

the utilisation of social media tools to enhance KS practices, lack of proper working environment and lack of workforce.

Technological challenges

These challenges are associated with poor technological infrastructure and high cost of internet connectivity, lack of awareness and training on how to implement and utilise social media tools to enhance KS practices among knowledge workers, lack of local expertise, lack of ICT technical support and lack of reliable power supply. Similar problems were also reported by other studies in Tanzania. Lwoga (2012) reported poor infrastructure including low internet bandwidth, lack of technical support and 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 per year which is very expensive for most universities to afford. Makori (2012) reported low rates of internet penetration and unreliable power supply are the main factors which hinder the utilisation of social media tools to enhance KS practices within academic institutions. Makori (2012) also found that internet connectivity in HLIs in Africa is inadequate, expensive and poorly managed.

Further, the lack of reliable power supply was mentioned by respondents as among the critical technological challenge facing many HLIs in Tanzania. Similar findings were also reported by the studies done by Muneja and Abungu (2012) that, only 10% of Tanzanian population is connected to the national grid electricity. Lwoga (2012) also reported power rationing since 2006 in the country which poses a great challenge to HLIs in Tanzania in the implementation and utilisation of social media tools to enhance KS practices.

Individual challenges

Respondents reported a number of individual challenges which include lack of awareness towards utilisation of social media tools to support KS practices, lack of training, technophobia, ignorance, lack of trust, age limit, lack of knowledge to share, and lack of motivations. Low of awareness of social media tools and change of mind-set was the main challenges reported by most of the respondents. Most knowledge workers are reluctant to use social media tools for KS and this is due to believing that social media tools are mainly for social interactions and entertainment such as chatting and uploading pictures.

Respondents also reported a lack of management support towards the utilisation of social media tools to enhance KS practices among knowledge workers in HLIs. Lack of encouragement and motivations among knowledge workers to utilise social media tools to enhance KS was reported as the main challenges. The same result was also reported by Paroutis and Saleh (2009) that, lack of organisational or management support in terms of communicating the benefits, lack of

necessary training and lack of rewards and recognition efforts are among the challenges which hinder the utilisation of social media tools to enhance KS practices.

Respondents also reported lack of time; resources and interest in the utilisation of social media tools to enhance KS practices are among the most common individual challenges which hinder the usage of social media tools to enhance KS practices among knowledge workers in HLIs. Respondents also reported lack of security and privacy in most of social media tools are among the challenges which prohibit the utilisation of social media tools to enhance KS in HLIs in Tanzania.

Inadequate knowledge and skills about social media tools, their benefits and how to go about using them, age limit and lack perceptions of certain risks and downsides associated with using social media tools are among individual challenges. In addition with regards to KS, Vuori and Okkonen (2012) add that, employees may not know that they have reliable knowledge to share for the organisation, even if employees recognize the importance of the knowledge to the organisation, they may not be motivated to share it and lastly, even if employees are motivated to share knowledge, there may be no mechanism to enhance KS within the organisation. Hislop (2003) reports that most of knowledge workers claimed lack of fairness, friendship, lack of trust and openness prohibit them to utilise social media tools to share their knowledge.

Conclusion and recommendations

This study gives an insight into the current situation on the utilisation of social media tools to enhance KS practices among knowledge workers. From the above findings, it revealed that, KS practices among knowledge workers at NM-AIST are relatively new and that the reasons for KS differ between the library and ICT-RC.

Knowledge workers need to be trained and motivated to share knowledge for the development of the institution. An understanding of KS itself is not sufficient. This study revealed lack of important factors to support KS practices. Therefore; despite the ambiguousness of KS practices at the NM-AIST, this research concluded that factors which can enhance KS practices need to be documented and implemented. The study also concluded that knowledge workers are very committed to their daily duties; however, they admitted on the importance of KS practices.

The study also concluded that the utilisation of social media tools within the library can provide linkage to the other already existing technologies (ILSs) in order to share and use library resources more effectively. HLIs need to employ various types of social media tools not only for KS but also to discover and improve service problems that can cause gaps between the institutions' targets and achievements. The utilisation of social media tools offers various advantages within HLIs; for example, to enhance discussion forum within various groups to facilitate easy access to the institutional resources, to enhance teaching, learning, research and

innovation and to support information and knowledge dissemination and other similar services. HLIs are, therefore, needed to adopt and utilise various types of social media tools to deliver more efficient, effective and accessible services to their clients. This study identified various challenges which affected the proper utilisation of social media tools to enhance KS practices among knowledge workers. The study, therefore, makes recommendations to address the challenges.

The study recommends staff training and development which can make HLIs' staff to be equipped with enough knowledge and skills on the utilisation of social media tools to enhance KS practices within HLIs. HLIs also need to employ different types of motivations such as rewards, incentives and recognition in order to encourage knowledge workers to share their knowledge. HLIs must consider and implement KS factors such as reliable technological tools, institutional structure, HRM policies and management support. Mechanisms for KS practices must be clearly defined and recommended in order to enhance the flow, dissemination, retrieve and use of knowledge among users.

The utilisation of social media tools to enhance KS practices among knowledge workers is well acknowledged as used in this study. Questions still remain about how these social media tools could be employed to improve other services offered within many higher learning institutions such as teaching, learning, research and innovation. The utilisation of social media tools to support the creation of new knowledge among knowledge workers within HLIs also need to be investigated. Knowledge creation and KS are one coin with two sides; therefore, this study investigates only one side of KS with the help of social media tools.

It was also pointed out that, social media can also help people to create knowledge but the question of how to do these still remains. The area of using incentives to encourage knowledge workers to share knowledge is also required further investigations. Incentives cannot only foster knowledge workers to share knowledge but can also foster knowledge workers to utilise social media tools to enhance KS practices. The use of theories to support the utilisation of social media tools to enhance KS among knowledge workers also need to be investigated. Social media policies to assist various activities within HLIs also need further investigations.

Research progress

The NM-AIST is registered on several social media tools to enhance the sharing of knowledge among its knowledge workers. Currently, the institution has accounts on Facebook and Instagram. However, the institution is still in the process of registering to more tools such as Twitter, Academia.edu and Wikis. The institution increases the bandwidth to ensure the usage of Internet. In addition to this, employees are using the local area network for some tools when they are within the campus.

Another effort was implementing knowledge ecosystem; this is an approach of Knowledge Management (KM) which claims to foster the dynamic evolution of knowledge interactions between entities to improve decision making and innovation through the improved evolutionary networks of collaborations (Wikipedia). Knowledge ecosystem explains in detail the procedures taken to be taken to ensure the application of social media tools to enhance KS practices at NM-AIST. Thus, in meanwhile, the institution is implementing six steps to ensure successful use of knowledge ecosystem as adapted from AnswerHub (2016). Table 1 shows KS initiatives progress at NM-AIST.

Table 1: Knowledge ecosystem implementation at NM-AIST

SN	Step	Activities	Progress	Future plans
1	Adopt	Application of social media tools for KS.	(i) Institutional Facebook (The Nelson Mandela African Institution of Science and Technology), Library Facebook (The NM-AIST Library) and NM-AIST Instagram page (NM-AIST Official) in place. (ii) Institutional website: https://nm-aist.ac.tz/ and library website: http://libraryservices.nm-aist.ac.tz/	(i) Create awareness among NM-AIST community (ii) Train on the use of social media tools for KS practices. (iii) Institution to make an active effort to motivate KS like making it part of performance review.
2	Capture	Building KS culture and prepare the methods to capture all the valuable knowledge such as video, voice, live feeds and the like.	(i) Increase the number of printed books in the library up to 10,000 titles by 2022. (ii) Increase the number of electronic resources in the library. (iii) Working institutional repository: http://dspace.nm-aist.ac.tz/	(i) Train employees on the effective capture methods for different types of knowledge, capture etiquette and ensuring user privacy (ii) Develop an open knowledge policy (iii) Apply big data analytics for knowledge mining. (iv) Create a list of FAQs (v) Develop offline document

				conversations among employees.
3	Organise	Create an information and KM platform	Still under development	Ensure the following:- ▪ Web–mediated; physical and virtual interactions; ▪ Professional exchanges; ▪ Knowledge capturing; ▪ Knowledge curation; and KS.
4	Reuse	(i) Scheduled knowledge shared on social media tools to the information and KM platform (ii) Develop knowledge re-use policy to establish ownership rights and good conduct	Still under development	The KM tree approach which will include
5	Improve	(i) Use user satisfaction surveys and analysis of user interactions with shared content to determine additional types of knowledge that need to be shared and capture methods to be supported (ii) Train users to share the knowledge	Still under development	KM as an organisational approach. This led to understanding that more attention needed to be given to the organisational setting in which people work, hence the introduction of concepts such as "knowledge-intensive environments" as well as "knowledge workers" working in such an environment.
6	Evolve	(i) Look at KS and interaction trends to identify societal needs and concerns	Still under development	(i) KM perspective on business models; in this case, the open business models will be adapted. (ii) Conceptualise the

		(ii) Develop business ideas to address the identified needs.		knowledge related functions into kind of hierarchical structure which may provide a logical basis of sharing and understanding the creation and flow of knowledge among knowledge workers in HLIs.

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