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Challenges in the Use of Web Technology on Knowledge-sharing Behavior of Academic Staffs: The Case of Ethiopian Higher Education

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Abstract

Universities around the world have faced challenges in maintaining face-to-face knowledge sharing. Knowledge sharing through web technology is an essential solution for all universities. However, web technology-based knowledge-sharing practices in developing countries such as Ethiopia face many challenges. This study examines the factors that challenge the use of web technologies for knowledge-sharing practices by academic staff and presents recommendations to improve the current environment in Ethiopian public universities. The study employed semi-structured interviews with 30 respondents and analyzed the data using Nvivo qualitative data analysis software. The results revealed that lack of technical skill, lack of systems integrated into teaching-learning practice, lack of awareness, lack of an appropriate reward system, lack of commitment from top management, lack of a knowledge-sharing policy, and a lack of knowledge mapping are among the identified challenges hindering the knowledge-sharing practice of academic staff. These findings provide evidence of knowledge-sharing practices and give insights regarding enhancing knowledge-sharing practices within higher education. In addition, this study also contributes to the body of knowledge about the challenges of knowledge sharing. The findings will benefit academic staff, university administrations, and higher education institutions. Future studies could consider replicating this study from a quantitative method perspective with a larger sample size focused on Ethiopian public higher education. This study could also be considered for replication from the perspective of private higher education.

Keywords: Knowledge-sharing Challenges; Web Technology; Higher Education; Academic Staff; Technology Acceptance Model

1. Introduction

Higher education institutions (HEI) are knowledge-intensive organizations (Ramachandran et al., 2013). They create knowledge through various mechanisms, such as scholarly research and teaching-learning practices. Knowledge resources are teaching materials shared through communication channels (Fullwood et al., 2013). Web technologies are also containers that store explicit knowledge for sharing purposes (Razzaque, 2020). Similarly, knowledge resources in the context of higher education contain knowledge that can be carried by a medium and shared among the higher education community. Knowledge sharing (KS) makes higher education more aware of the need to establish the correct mechanism to foster the

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exchange and flow of knowledge. It is vital to understand the significance of KS for higher education institutions, where success depends upon the generation and utilization of knowledge (Haque et al., 2015).

Most HEIs have made significant investments in institutional websites (Aldhmour & Doyle, 2023; Pinho et al., 2018), the main goal of which is to collect knowledge from various sources and create central access to knowledge resources (Pinho et al., 2018). Previous studies have shown web technology provides personalized interfaces that provide access to knowledge resources (Aldhmour & Doyle, 2023). While researchers and practitioners are interested in studying the acceptability of information technology (IT) and web technology, understanding why the academic staff is not using web technology for KS is a challenging research topic (Alotaibi et al., 2017; Ramjeawon & Rowley, 2017).

There are several terms used to define academic staff, including faculty (Borthwick & Hansen, 2017; Kim & Ju, 2008; Sriwichai et al., 2014) as well as educators (Doukakis, 2021; Lawrence et al., 2019). As in current research (Adam et al., 2020; Alotaibi et al., 2013; Nassuora, 2011), they have used the term academic staff. In all cases, the authors meant HEI employees who teach, perform research, advise students, and provide community service. In this study, academic staff at two universities were interviewed as the primary source of data.

A systematic literature review of KS among academic staff in HEIs was conducted by Al-Kurdi et al. (2018) and Gebreyohans et al. (2022). It is reported in both articles that the amount of research conducted on understanding knowledge sharing in HEIs is limited as compared with other sectors. KS practices among business organizations have been extensively studied. According to Al-Kurdi et al. (2018), technological support and infrastructure play a significant role in facilitating KS. They view, however, trust and culture as more important than technology infrastructure. Therefore, based on available technology in HEI, literature does not provide a comprehensive picture of individuals' KS behavior and a little research has identified the factors that challenge the use of web technologies for KS within HEI. We argue that web technologies for KS practices in HEI are relatively unique to the industry and culture of HEI. Prior research has also concentrated on system usage without examining the challenges and factors hindering the use of web technology that might affect its use (Aldhmour & Doyle, 2023; Alemu, 2015; Alotaibi et al., 2017; Hossain et al., 2013).

The majority of Ethiopian universities use various web technologies. However, their quality, usefulness, and usage rate are unknown (Kiros et al., 2018; Wondemtegegn, 2017). Studies focused on investigating the use of web technology for KS in Ethiopian HEI are also rare and inconsistent (Bayu, 2018). This study aims to understand the factors that challenge academic staff's use of Web technology for knowledge-sharing practices. Prior research on technology-enabled environments believes that technology has the potential to enhance teaching quality and reduce instructional barriers without compromising academic integrity (Aldhmour & Doyle, 2023). Despite the advantages of web technology for KS and teaching-learning practices, Wondemtegegn (2017) and Tesfaselassie (2019) disclosed that

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these technologies are underutilized in Ethiopian universities. Most universities in Ethiopia have not fully adopted Web technology for knowledge sharing. Thus, the current use of web technology in Ethiopian HEIs negatively impacts academic staff-sharing behavior. Therefore, this research examines the factors that challenge the current use of web technology in KS practices and presents recommendations to improve the current environment within HEI. Therefore, the main research question of this paper is:

(1) What are the challenges of the current use of web technology in the knowledge-sharing behavior of academic staff in higher education institutions?

2. Literature Review

Knowledge management (KM) plays a critical role in HEI and is a valuable tool to meet organizational goals (Almujally & Joy, 2020). HEI engage in significant knowledge management activities such as knowledge generation, organization, storage, sharing, usage, and maintenance. KM is a technique for achieving organizational goals in HEIs (Aldhmour & Doyle, 2023). Kim and Ju (2008) also asserted that KM is the process of capturing, storing, organizing, and sharing knowledge. Among these phases, knowledge sharing (KS) is a critical KM process that influences its success. KS can be defined as the behavior of disseminating knowledge with others within an organization (Yu, 2014). It is considered an important factor in both achieving organizational effectiveness and supporting high levels of individual innovation (Aldhmour & Doyle, 2023). In our study context, KS refers to the exchange of knowledge and skills among academic staff so that they can be enhanced and organizational goals can be achieved. In order to comprehend this study, it is necessary to understand the extent to which academic staff are willing to share their knowledge through existing web technology.

Knowledge-sharing behavior (KSB) enhances mutual learning, promotes best practices, reduces operational costs of redundant learning, creates new knowledge, and increases organizational performance (Wang & Lin, 2021). In the context of HEI, KSB would refer to the academic staff sharing their teaching-related knowledge and expertise with other faculty members within the university, which can help elevate the quality of education (Almujally & Joy, 2020). This aligns with the definition of KS as encompassing knowledge acquisition, documentation, transfer, construction, contribution, and gathering (Aldhmour & Doyle, 2023). Academic staff teach, do research, and provide advice (Jolaee et al., 2014) and is regarded as the primary source of knowledge in higher education. They use various mechanisms to create, share, and use knowledge, including technology-based ones (Alotaibi et al., 2017; Pinho et al., 2018). This has gained attention among researchers, primarily in higher education (Koranteng & Wiafe, 2019; Noprisson et al., 2017; Razzaque, 2020; Smith et al., 2015; Yigzaw et al., 2021). The knowledge shared by the academic staff can be explicit and tacit. While explicit knowledge can be easily expressed in words or symbols that can be stored, retrieved, or transferred to be used at any time, tacit knowledge cannot (Nonaka & Takeuchi, 1995). Therefore, academic staff as members of HEI have the responsibility of generating knowledge through

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research and disseminating the knowledge through teaching practice via existing web technology (Ramachandran et al., 2013).

2.1 Knowledge-sharing challenges in higher education institutions

The missions of HEIs include conducting academic research, teaching and learning, and community service, which are closely linked with KS (Fullwood et al., 2013; Koranteng & Wiafe, 2019; Ramachandran et al., 2013). However, numerous challenges or barriers hinder the smooth flow of KSB among academic staff. It has been argued that if higher education is to succeed in KS, it must focus on the challenges (Chong et al., 2014; Chung & Anh, 2022; Riege, 2005). In response to the growing importance of KS, researchers have begun to study KS challenges in various organizational setups (Akosile & Olatokun, 2020; Assefa et al., 2013; Lilleoere & Hansen, 2011; Riege, 2005). Lilleoere and Hansen (2011) looked into different types of KS challenges in the pharmaceutical sector. Knowledge hoarding, a lack of socialization, a lack of trust, organizational politics, and a lack of committed leadership were challenges in KS. Numerous studies have been conducted in organizational and industrial settings. However, a few studies have been done on HEI (e.g., Chong et al., 2014; Fullwood et al., 2013; Ramjeawon & Rowley, 2017). Chong et al. (2014) found that HEI lacks a reward system, IT infrastructure, and trust among academic staff. Ramjeawon and Rowley (2017) and Fullwood et al. (2019) discovered barriers in a university, including a lack of KS policies and reward systems, frequent leadership changes, and a lack of research repositories. Yigzaw et al. (2021) argue that a lack of KS awareness can be visible in the absence of active utilization of technology for KS among academic staff within HEIs. Top management support and commitment to KSB may be demonstrated by providing support through bonuses and resources, so that elements of organizational factors may encourage KS (Fauzi et al., 2018). While literature attempts to identify KS challenges, higher education continues to face difficulties in ensuring KS (Alotaibi et al., 2017).

The review of the literature has also revealed that very few previous studies have included a technological component in their studies on knowledge sharing in higher education. Yigzaw et al. (2021) and Mansourvar and Yasin (2010), for example, examined the various knowledge activities of academic staff to determine the extent to which information systems influence those activities and how those activities lead to value creation and knowledge management. Almujally and Joy (2019) focused on assessing the academic staff successfully using web technologies to manage their teaching expertise. The study points out that, many universities still struggle in documenting, sharing, and reusing the knowledge gained by academic staff due to the absence of a collaborative platform where novices and experts can interact and collaborate. Adam et al. (2020) point out that most nursing school academic staff especially in developing countries lack the requisite infrastructure for knowledge management. It is evident that some of the challenges of the use of web technology for KS in developing countries are similar, and some are unique to particular countries. Yigzaw et al. (2021) caution that information technology solutions must be compatible with the human and

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contextual factors of any country. In addition, previous research did not well address the interactions of these challenges on KSB among academic staff within HEI. Therefore, it can be concluded that HEI perceived sharing teaching experiences as a crucial activity that can help them enhance their quality teaching and overcome the previous challenges. However, the challenges to the behavior of academic staff on the use of web technology in KS have not been carried out in Ethiopia, especially in the context of public universities. This study will therefore bridge the gap that exists in the current knowledge on challenges to the use of web technology for KS in the Ethiopian context. Furthermore, given the highly contextual nature of KSB and the unique organizational climate of HEIs, future research is required to understand the KS challenges that impede academic staff-sharing behaviors in HEIs. Therefore, the study involved gathering data from academic staff in two Ethiopian public universities about their perceptions and experience on the challenges that hinder the behavior of academic staff in the use of web technology for KS practice. The paper has also recommended possible solutions to overcome these challenges. The findings from this study will serve as important reference material and a basis for further research by academic staff and researchers on the both national and international front.

2.2 Theoretical background

Theoretical concepts of technology acceptance predominate in published literature. The goal of these concepts is to construct a route to technology use based on external factors to comprehend how people's intentions to use new technology change (Alotaibi et al., 2017; Alsmadi et al., 2017; Fari, 2015). Among the most prevalent theory to arise is Technology Acceptance Model (TAM). Davis (1989) developed the TAM, a widely used behavioral model for predicting and explaining IT usage. Perceived ease of use and perceived usefulness are two significant beliefs identified by the TAM. Users are more likely to use the platforms if they believe they will improve their job performance (Esmaeilzadeh et al., 2013). Another factor that influences KS behavior is perceived ease of use, which refers to the belief that using technology for KS is simple (Tsai, 2014). According to the TAM, using web technology is influenced by the user's intention to use it, which is determined jointly based on perceived ease of use and perceived usefulness. TAM has been widely applied in practice, extended in HEI, and empirically tested in the KS-related literature (Tsai, 2014). Pinho et al. (2018) found that perceived usefulness and ease of use positively affect employee use of social media. Academic staff may encounter difficulties when using web technologies for online KS, such as knowledge repositories, digital libraries, and learning management systems (LMS). Designing a system that is easy to use, providing training on how to use these web technologies, and creating awareness of the usefulness of these systems for KS is likely to enhance the KSB (Alotaibi et al., 2017). This study then goes on to configure the model by including external predictors of intention to use and actual use of web technology for KS, i.e., relevant technical skills, training, reward system, knowledge mapping, system integrated into teaching practice, awareness, KS policy and commitment of top management.

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2.3 Higher education institutions in Ethiopia

In both developed and developing countries, Information and Communication Technology (ICT) is increasingly used as an enabler and a transformational tool to foster economic growth and improve knowledge transfer (Wondemtegegn, 2017). To increase efficiency across sectors, Ethiopia's government has made huge investments in Ethiopia's telecommunications sector to acquire the latest technology and expand services (Wondemtegegn, 2017). In a similar vein, the Ethiopian government places a great emphasis on HEI to achieve economic growth. The government has acknowledged the importance of ICT in supporting the education sector and has taken significant steps to fulfill the responsibilities of HEIs, including teaching and learning, problem-solving through academic research, and various community services (Girmaw, 2014; Tamrat & Teferra, 2018). The Ethiopian Ministry of Education is also trying to evolve toward a knowledge-based economy. Technology-based KS programs have been implemented to help higher education to achieve its goal. For example, the number of public HEI has increased over the last decade to 45. These HEI are geographically distributed around the country (Tamrat & Teferra, 2018). The minister of education has also established a digital library that all Ethiopian universities must use for KS purposes. According to the literature, in most Ethiopian HEIs, various network facilities are designed to support teaching and research activities (Ergado et al., 2022; Ferede et al., 2022). However, the Ethiopian education system is not supported by ICT (Ferede et al., 2022). Currently, they are used for simple applications like emailing and internet browsing (Bekele & Abebe, 2011; Tesfaselassie, 2019). In addition, their usefulness, and usage rate are unknown (Kiros et al., 2018; Wondemtegegn, 2017). There is also a lack of studies focused on investigating the use of web technology for KS in Ethiopian HEI. According to Alemu (2017) and Bayu (2018), the adoption of ICT in Ethiopia is at a very early stage and its penetration into the education sector has been slow (Ferede et al., 2022).

In addition, Addis Ababa University and Haramaya University are primarily knowledge-oriented institutions that produce competent graduates in a wide range of fields, conduct cutting-edge research, disseminate knowledge, and provide services that meet community needs. This implies that knowledge plays an important role in sustainability and competitive advantage in these institutions. It is, however, challenging for these universities to effectively disseminate institutional knowledge via the existing web technologies, that are embodied in individuals across the institution. These Ethiopian universities are not fully utilizing these technologies to facilitate knowledge sharing, and knowledge sharing has not been adequately facilitated. Therefore, web technology-based KS does not exercise or actively practice in various Ethiopian HEIs. Consequently, the current use of web technology in Ethiopian HEIs negatively impacts academic staff-sharing behavior. From the above discussion, it has been understood that exploring the factors that challenge the web technology-based KS of academic staff in universities to recommend possible enabling mechanisms that could further enhance the utilization of web technology for KS practices is required. Therefore, the purpose

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of this study is to explore the challenges of the knowledge sharing and web technology used at Addis Ababa University and Haramaya University through semi-structured interviews. The study findings may provide insight into the use of web technology for KS and academic staff members can share their experiences and content can be stored and accessed remotely or electronically. The result of the study may also play a pivotal role in the transformation of the university into a knowledge-based institution to enable the effective dissemination of knowledge resources for institutional effectiveness and education quality.

3. Research Method

In this section, we discuss how this study was conducted. It includes the sampling method, the data collection procedures, and the data analysis.

3.1 Sampling method

This study aims to understand the challenges that hinder the web technology-based KSB of academic staff. Two Ethiopian public universities, Addis Ababa University, and Haramaya University are purposefully selected. These universities were chosen because they have a long history of teaching and conducting research. Additionally, the availability of web technology within the university was used to select these higher educations over others. These two universities are considered as a single case study. Because cultural differences should be taken into account when selecting universities. The unit analysis of the study is focused on the individual level.

There is variation in the sample size used for qualitative research. According to Mocănaşu (2020), there is no consensus concerning sample size, which varies between 1 and 350 units included in a sample. Its size depends on many factors, including the scope of the research, the type of approach, the researcher's experience, the journal where they publish, and research time. Bowen (2008) describes theoretical saturation as the state where: there are no more issues that come to the foreground about a data category; the researcher does not acquire any new insights, and finally, no new themes emerge or can be identified. Purposive sampling Bowen was employed to identify academic staff at both HEIs. Because some members of the group have more information than others because of their roles, status, and past experiences (Kothars, 2004). Purposive sampling was employed for this research to identify key respondents, such as the department head, college dean, and senior researcher, from the academic staff of both HEIs (See Table 1). Research participants were also selected to represent academic staff from different work experiences and gender groups. The researcher considered work experience and position in the selection of research participants. Research participants were selected from Addis Ababa University and Haramaya University. First, the researcher selected academic staff in managerial positions like department heads, college deans, and directorates. Based on the criteria mentioned above and the recommendation of the first interviewee, the researcher selected the next research participants.

3.2 Data collection

Data were collected through interviews followed the guidance of Walsham (1995), as shown in Table 2. Semi-structured interviews

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Table 1. Samples Selected for Interview Discussion

Categories	Addis Ababa University			Haramaya University			Total
Job titles	Associate professor	Assistance professor	Lecturer	Associate professor	Assistance professor	Lecturer	
Gender							
Male	2	4	4	1	4	6	21
Female		2	3			4	9
Position							
Teaching staff	2	5	7	1	1	5	21
Collage dean					1		1
Department head					1	5	6
Directorate		1			1		2
Age							
< 30			2			5	7
30–34		1	5		2	5	13
35–39		5			2		7
40–44	1			1			2
45–49	1						1
> 50							
Work experience							
<5			3			2	5
5–10		3	4		2	6	15
11–15	1	3		1	2	2	9
16–20	1						1
>20							

were used to gather data from respondents from both universities, which had 11 items and were prepared in English (English being the medium of instruction in higher education). Data collection started collecting pilot data on June 9, 2021 and lasted until June 26, 2021. The interview question was reviewed by academic staff from both universities with backgrounds in knowledge management and by senior academic researchers. Four academic staff members from Addis Ababa University participated in a preliminary evaluated the questions. A second version that was piloted by two additional academic staff members from Haramaya University incorporated the suggestions. Therefore, the questions were refined and designed in a logical order. The refined interview guide with the objectives of the research was forwarded ahead of time to the academic

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staff. All of the interviews were conducted in face-to-face meetings with academic staff. The data collection continued until it reached saturation, i.e., when no new information was gained from multiple academic staff and interviews resulted in similar recurring information from multiple academic staff. The interviews ranged from 30 to 60 minutes, depending on the respondents' levels of involvement in the process, and were recorded on audio.

The actual data collection took about nine months (September 2021–May 2022). After discussing the purpose of the research and the importance of knowledge sharing in the HEI, the researcher started an interview discussion with the interviewees. All of the participants agreed to let the researcher use the tape recorder. Researchers appreciate tape recording because it provides a complete and detailed account of what participants said throughout the interview. The researcher took only notes on the main points during the discussion. The researcher also asked additional questions as necessary to get new perspectives, which were not on the interview checklist. 36 interviews were done, which reached saturation at interview 30. At 30 respondents, the items in the semi-structured question become saturated, and no new concepts are found. In this study, the initial

Table 2. Interview Themes and Questions

Theme	Interview questions
Management support	What kind of support does the university management render to encourage knowledge sharing?
Knowledge policy	Is there a knowledge-sharing policy at your university?
Knowledge mapping	Do you think institutional knowledge is stored in knowledge repositories and accessible to all within the university?
System usage	What are the primary digital technologies that you would use to reach out to others and share knowledge?
System usage	What are your primary reasons for using (or not using) this tool? *<Probe> How frequently do you use these tools?*
Intention to use the system	How have these tools changed the way you keep in touch and interact with others? *<Probe> Who do you interact with using this tool/media?*
Perceived usefulness	How do you perceive the usage of web technology with knowledge sharing? *<Probe> Does it enable knowledge sharing? Please, elaborate.*
Easy to use	Do you think you are experienced and can understand how to use the existing system? *<Probe> How comfortable are you using these systems?*
Reward system	Does the university provide rewards to academics as a means of motivating KS? (e.g., recognition, financial bonus, promotion, day off or leave, etc.)
Challenges to KS	What factors influence knowledge sharing among academics in your universities? (Please elaborate on them.)
Recommendation	What should be done to improve KS at the university?

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questionnaire was developed based on TAM and previous studies (see Table 2). It was intended that the interviews would answer the primary research questions. Through the interviews, we explored the barriers to web-based knowledge sharing.

3.3 Data analysis

The interview was conducted in English, which is the working language in Ethiopian higher education, and Amharic, which is the official language of the country. The researcher translated the Amharic interview discussion into English. Then, the researcher sends the translated version to the respondents to minimize the distortion of meaning in the translation, if the English version correctly represented their views. Therefore, data collected through a voice recorder was manually transcribed and translated into English by the researcher in Microsoft Word. Then the word files were imported into NVIVO software. NVIVO (version 12) was used to organize and code the qualitative data. The software was selected because it is specifically designed for qualitative data analysis (Braun & Clarke, 2006).

There is no consensus on a standardized qualitative data analysis technique (Braun & Clarke, 2006; Mocănașu, 2020). Prominent scholars, such as Creswell and Creswell (2018), have said that the most widely used data analysis technique in interview transcriptions chooses between content and thematic analysis. According to Creswell and Creswell (2018), content analysis has significant drawbacks as it is considered too theoretical and difficult to code themes. According to Braun and Clarke (2006), thematic analysis is a fundamental technique for qualitative analysis. Therefore, the qualitative thematic analysis method recommended by Braun and Clarke, was believed to be more desirable for this study. They suggest that codes should be linked to the conceptual framework created by previous theories. This approach made it possible to identify the aspects of the empirical data that deviated from the conceptual framework while still guiding the analysis and interpretation with certain expectations. Therefore, thematic analysis is used to identify, analyze, and report the findings of the collected data.

Data collection and data analysis were undertaken side by side, as data analysis informed new data to be collected (Yin, 2018). Integration of data collection and data analysis gives flexibility for the researchers to add new data points. The interview data were transcribed by listening to and pausing the interview records several times immediately after the interview. This generated emerging insights to guide the subsequent data collection efforts and enabled modification of the subsequent interview guide to collect quality data (Braun & Clarke, 2006). Repetitive listening and reading of the interview records and transcripts were employed to categorize the identified factors. These categories were also cross-checked with KS and web technology use-related literature while analyzing the data. In addition, A pattern-matching technique is applied to capture themes by categorizing and coding qualitative data gained through interviews. A pattern is a concept that appears in various data sources (Yin, 2014). The TAM and additional variables from literature were used as the starting code categories to classify empirical data into abstract concepts. The themes discovered represented a collection of factors that the interviewees consistently highlighted. This

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study follows Braun and Clarke's (2006), six phases of thematic analysis: becoming familiar with the research data, creating preliminary codes, looking for themes, reviewing themes, defining and naming themes, and producing the report.

4. Results on the Challenges that Hindered Knowledge Sharing Behavior

The main target of the study was to explore the challenges to intentions and behaviors of academic staff in the use of web technology for KS within their university. Though an attempt is made by academic staff to use the different KS platforms, the level of use of these web-based technological platforms for KS purposes within the university is weak. To that end, academic staff was polled about their use of university-owned systems (eLearning, university repository (FTP), and digital library) and social media platforms. The challenges facing the academic staff at their KSB and the reason for the low usage of the web technology platform for KS purposes are discussed below.

4.1 Relevant technical skills

Respondents interviewed to assess their technical abilities used web technology to share their materials, such as teaching material, academic research output, and project experience. The result reveals that a lack of relevant technical skills in using the university-owned systems is challenging or hindering the KS practice at both HEIs, due to inadequate or a lack of training on existing technologies. The non-technical staff appears to have difficulties. As the director for library and information services explained this condition as follows:

"Yes, some academic staff face challenges using web technology, such as the e-learning platform. When the system starts up, complaints arise, especially from academic staff who come from non-technology departments. They complain that I cannot log in and that I can't get the pages. Some say the system does not work, but the system works. The reason for this is a skill gap in web technology." [respondent 5]

Furthermore, as majority of the respondents say that technical skill gap creates discomfort when using the system. Most of them prefer face-to-face communication to technology-based KS. More evidence indicates that university-owned platforms are not easy to use, even for advanced users. This makes things more complex for academic staff who lack technical skills. Respondents from both universities explained this condition as follows:

"Some of the KS platforms owned by the university are not user-friendly; for example, when I was trying to use the e-learning system (Moodle) to upload materials initially, the default setting asked for extra steps, which are very difficult, especially for non-technical people; I am from a technology-related field, but I had difficulty accessing the systems for the first time; this makes the academic staff uncomfortable to use, or we prefer face-to-face communication over technology-based sharing; therefore, there should be training on how to use the existing systems." [respondent 10]

Discussion with the respondents reflects a lack of technical skills among academic staff, leading to face-to-face methods for sharing knowledge between the academic staff. Though some of

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the teaching staff have basic computer literacy skills, these skills may not be adequate to use the existing system in teaching practice or developing e-content. Because of this, most academic staff prefer social media platforms like telegram groups, email, and Facebook groups, which are easier to use for sharing and managing resources than university-owned platforms.

4.2 Training on the existing system

Training refers to the availability of training provided by higher education to its academic staff on how to use the systems. The implication is that proper training allows academic staff to use these systems to share their knowledge with their students and coworkers. Most respondents explained that the university has systems that can serve KS through the teaching-learning process or directly from academic staff to academic staff. However, there should be training on how to use these systems. The current training schedule shows that training is provided when new software is released; otherwise, there will be no additional training. The respondents explained this as follows:

> *"There are various systems like the eLearning system, FTP, and grant management system, but some of the systems are difficult even for advanced users; they are not user-friendly, and they do not have a help menu on how to use the system (video-based, image-based, or textual steps); therefore, there should be continuous training on how to use these systems; however, currently, the university is not providing training on those systems."* [respondent 6]

Academic staff who was involved in developing the eLearning system also reveal their observation as follows:

> *"I have assisted people with difficulties in learning how to use the university system, specifically the grant management system; we give training on how to use the system at the time of installation; however, in case a new feature is added to the system, we do not provide training; instead, we prepare PDF format material that shows how to use the newly added feature, and then we distribute it by email to all academic staff at the university, the challenge is the frequency of training arranged by the university."* [respondent 12]

Furthermore, respondents added that the challenges are not only from the system side but also from the commitment of the management to direct the academic staff to use the system.

> *"The management has to force the staff and students to use the existing systems; if you make all staff put their teaching materials on the FTP and eLearning systems, then the systems will become integrated into daily teaching and learning practice; academic staff will become familiar with the system to the point that juniors will use it by asking their senior staff."* [respondent 2]

We can conclude that the utilization of these web technologies is weak. Even if various web technologies are available to support the KS practice, due to the lack of training and commitment from the management side, the use of web technology by academic staff in the HEI is low.

4.3 Knowledge mapping

Knowledge mapping provides a guide to internal repositories or sources of knowledge. These sources may include documents, files, databases, recordings of best practices or activities,

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or web pages. Respondents focused on four systems (the e-Learning system, the knowledge repository, the grant management system of the university, and the digital library provided by the Ministry of Higher Education). We observe that respondents are less satisfied with the function of these systems. Almost all respondents from both universities suggested that the e-Learning system of the university allows the sharing of knowledge from teachers to the students who are registered for the specific course only; regarding the grant management system, the system allows people to view the titles and abstracts of proposals submitted but cannot download; researchers manage the proposal or thesis they submit. In addition, the FTP is there, but it has two challenges: it is not accessible outside the campus, and its content is not updated regularly.

One respondent explained that:

"The knowledge we shared is supposed to be mapped to disseminated to the users. However, there is a problem with knowledge mapping, the knowledge we shared in Moodle is for example, only restricted to the instructor and the students who are registered for that course." [respondent 5]

As a summary, respondents understand that knowledge mapping is useful for ease of access as the knowledge is well structured and available at a central place the knowledge of educators in these HEIs is dispersed or not shared through the existing ICT tools. Consequently, university communities do not benefit from such services since knowledge mapping is lacking.

4.4 Systems integrated into the teaching-learning practice

Knowledge sharing seems to work best when it is an automatic part of organizational life. Systems may support KS best when they do not create a burden for the user (Caruso, 2017; Roba et al., 2016). In this way, knowledge sharing does not become another irritation or cause a change in the working environment. This study identified various systems within the university, including the digital library initiated by the Ministry of Education. These systems may serve as the university's knowledge repository and become part of the day-to-day KS practices through the teaching and learning process. However, respondents mentioned that none of these systems integrated into the daily teaching-learning process. Respondents from both universities explained this:

"At the time of the COVID-19 breakout, the university management directed all academic staff to share resources among academics and deliver courses via the eLearning system, but after students returned to campus, every staff member stopped using it; currently, we are delivering courses through the regular face-to-face method and sharing resources via a telegram group with the students as well as via email with staff." [respondent 9]

Similarly, others discussed that,

"Mostly, I am using social media rather than the university system; one of the fundamental reasons is that materials uploaded to the university systems have limited accessibility; in addition, materials are uploaded to the FTP server only through the ICT office, which makes academic staff uncomfortable to use the system; there should be management direction

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that staff and students should use the system and integrate it into the daily teaching and learning process." [respondent 12]

The semi-structured interview with the respondents shows that, while there are various systems within the university, including the digital library initiated by the Ministry of Education none of these systems are integrated into the daily teaching-learning process. That is why academic staff prefer face-to-face interactions or social media platforms.

4.5 Awareness of the existing web technology

Creating awareness of the availability of the existing web-based resources for academic staff is critical to using them for their intended purpose. Respondents revealed that the level of awareness of existing technology among academic staff at these universities is low. With the question, "What would be done to improve KS practice via web technology within the university?" The respondent suggested that:

"Academic staff should be made aware of the importance of KS through web technology, and its benefits should be clearly defined to work on the KS platforms." [respondent 21]

Almost all respondents agreed that there is a lack of awareness of the use of web technology among academic staff. Furthermore, the digital library, initiated by the Ministry of Education, is integrated with the university website. However, respondents from both universities repeatedly stated, they do not have any information about that system, and they have never looked at it.

As an example, one of the senior academic staff discussed Ministry of Education's digital library.

"I am unaware of that system. I suggest, university-owned systems should be clearly defined for academic staff so that we can aware of their existence and advantages." [respondent 18]

In conclusion, the findings revealed that, the use of ICT in education for KS is still in its infancy due to a lack of awareness among academic staff about how digital technologies can be applied effectively to KS.

4.6 Knowledge sharing policy

A knowledge-sharing policy would motivate the academic staff to share their knowledge and provide guidance for capturing, organizing, and sharing knowledge (Diriye, 2019). Respondents assess if the university has policies for KS. The results show a national policy for KS is there, and Addis Ababa University has also adopted a KS policy. Respondents from Addis Ababa University explained the situation as follows:

"There are two policies: one is the national policy from the Ministry of Education, entitled 'open access policy.' This policy states that all resources, such as MSc and Ph.D. theses, should be open and deposited in the university repository. Next, journal articles published by academic staff have to be accessible. Research data has to be open and accessible within the university; this is from the national policy for all Ethiopian universities. In our university context, we have a KS policy that is entitled 'data sharing policy.' Stating that every researcher and graduate student who used any data for research should be accessible in the university repository." [respondent 11]

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However, most of the respondents from Haramaya University commented that there is no KS policy. Almost all of the respondents explained the situation as the university has no KS policy to promote tacit and explicit knowledge sharing. Having a repository by itself is not a solution for knowledge sharing. So, the institution must have a policy that requires academic staff to know the benefits of using web technology for KS.

In addition, respondents from both universities were unaware of their university's KS policy.

"I have no idea about the existence of the KS policy; but, as far as I know, my lecture materials are only in my hands and the hands of my students; there is no central repository; however, according to university legislation, published articles earn academic staff additional points for promotion." [respondent 7]

In summary, the results from the respondents indicated that there is a lack of awareness, and while most of the respondents stated that there is a KS policy, some said they did not know of its existence. Therefore, awareness creation by top management has to be there. And using web technology has to be a requirement supported by policy. The result also shows that not all universities inherit the national knowledge-sharing policy and instead have their own.

4.7 Reward system

Lack of rewards and other motivators may prevent knowledge sharing. In this regard, Alam et al. (2009) noted that a lack of motivation and a reward system deterred people from sharing and using knowledge. According to respondents, financial incentives play a part in encouraging people to share their knowledge with others or through a knowledge repository. However, respondents stated that,

"Sharing teaching material or academic research is considered part of academic tasks, so there is no reward system and no clear guidelines prepared for a reward system by the university for knowledge sharing." [respondent 8]

Other respondents also explained as reward system in learning institutions is a motivational factor that encourages and drives educators towards considerable cooperation with our peers or via ICT tools. However, the university is not considered a reward system as a motivational scheme.

"We can use academic research for promotion, or there are annual research computations, and if I can be selected for the proposal, I will be given support to conduct the research. There are, however, no incentives from the university for sharing teaching materials or other incentives as motivation." [respondent 14]

In summary, it is evident from the results that a majority of respondents would participate more in knowledge sharing if they knew they would be rewarded. There is, however, no reward system in place at the university for sharing academic knowledge.

4.8 Commitment from top management

The university management should follow up with the academic staff and the existing web technology of the university. They should direct academic staff to use technology to share resources such as research output, teaching materials, and project experience. Respondents discuss that there is a lack of leadership commitment. Respondents have explained as follows:

"I can give you one example at our university: by the initiative of the Ministry of Education,

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they sent the Microsoft Office 365 tool, and the ministry's direction was that every university should have its institutional email; but because of the weak management in general and the weak ICT management in particular, our university email is not functional." [respondent 27]

Respondents were also asked, "How do you perceive the usage of the existing web technology for knowledge sharing?" one of the respondents explained this condition as follows:

"The existing systems are useful for KS, but people are not using the university-owned ICT tools; including myself we are not using the university network; there should be leadership commitment to direct and motivate educators to use the ICT tools." [respondent 16]

The results revealed that there is a lack of top management commitment to motivating educators through various mechanisms. A lack of commitment by top management hinders knowledge-sharing practices in higher education.

5. Discussion of Findings

The findings of this study indicated that improved web technology awareness on the use of KS, the availability of a reliable system, the availability of appropriate training on how to use the existing web technology for academic staff, and leadership commitment are effective indicators to improve the intention to use web technology for KS purposes. Respondents believe these can help them address different learning styles and increase academic achievements. The semi-structured interview also revealed that in Ethiopian HEI, the availability of IT infrastructure does not significantly hinder KS. The reason suggested by respondents was that at the Ethiopian HEI, the availability of IT infrastructure enabling knowledge sharing is well established. However, there is a need for a mindset shift, particularly among top management, to recognize that IT infrastructure is not the only indicator of web technology used for KS. To address the challenges confronting KS practices, researchers emphasized that institutions should develop KS policies to enable effective sharing and management of knowledge (Aslam et al., 2013; Bhusry & Ranjan, 2011; Islam & Khan, 2014). In this regard, promoting KS among the academic staff in the institutions with the support of an institutional repository and the support of the respective top management for implementing KS initiatives at an institutional level should be included (Iqbal et al., 2011). The following section discusses the challenges identified by respondents.

Technical skills have a significant impact on navigating through various systems in HEIs. Studies have shown that it is essential to have skilled people to ensure the success of KS via technology (Rashida, 2017). The result of this study confirmed that there is a lack of technical skills among academic staff. Similarly, Al-araibi et al. (2019) stated that if higher education has enough hardware for adopting e-learning, the result might be a failure if the academic staff lacks the technical skills necessary to use that system. This lack of relevant technical skills is challenging the KSB of academic staff in Ethiopian HEIs. This result is similar to that of Barakabitze et al. (2019), who argue that if users do not have the skills to use the technology, KS will not succeed. Thus, we conclude that while technical skills are needed to use web technology in higher education, academic staff's resistance to using web technology is due

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to a lack of technical skills. From (2017) suggests digital competence can contribute to the frequent use of digital technologies. Barakabitze et al (2019). confirm that training allows academic staff to understand the system. This study also confirms that a lack of adequate training is one of the challenges facing KSBs of academic staff within these HEIs. Thus, to encourage staff to share their knowledge, there should be appropriate training on how to use the existing web technologies in the HEI.

Knowledge mapping refers to the process by which knowledge produced by academic staff has to be accessible via university web technologies to all academic staff. This research confirms that one of the challenges for KS is that the resources shared by academic staff through various web technologies are not accessible to the academic staff. For example, the grant management system does not allow downloading the research output materials uploaded. The eLearning system does not have the functionality to share resources among academic staff. We conclude that the challenge for knowledge mapping is a lack of knowledge-sharing policies that direct how to make the stored resources available. Rajalakshmi et al. (2010) found that, although some organizations handle knowledge mapping efficiently and effectively, many still face challenges in managing knowledge.

Integrating web technology into teaching and learning practices motivates academic staff to share their knowledge through these web technologies. Literature also suggests that systems may support KS when they do not create an extra burden for the user in daily operations and work seamlessly with other elements of the daily work process (van den Brink, 2001). This study disclosed that academic staff primarily share resources via face-to-face methods or social media due to the lack of systems integrated into the teaching-learning process. They used social media platforms such as telegram groups and email instead of university-owned platforms. This study shows that there is no system integrated into the teaching-learning practice. In addition, some academic staff do not know the existence of some systems; others may be aware of them but unfamiliar with their features. Van den Brink (2001) recommends expanding existing systems to work seamlessly with already-existing ones. Some academic staff perceived web technologies as a one-way communication channel between teachers and students, resulting in a lack of traceability and the opportunity to improve teaching quality.

The other concept discussed in this study was the level of awareness among academic staff about the existence and usefulness of web technology for KS. The interview result shows there is a lack of awareness among academic staff. Therefore, a lack of awareness among academic staff about the existence and usefulness of these web technologies hinders the utilization of web technology for KS purposes. According to Riege (2005), professionals from public and private universities agreed equally with this barrier to KS. According to Anberbir (2015), one of the indicators pointing to the low level of use of e-learning in higher education is the lack of awareness of the benefits of e-learning by academic staff and administrative staff. We conclude that to raise the academic staff's awareness through training, the concern or commitment of top management may be necessary.

Establishing a KS policy is essential for higher education to succeed in KS. The literature also

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argues that KS policies encourage academic staff to share knowledge and provide a guideline to externalize their knowledge (Akosile & Olatokun, 2020). The result indicates a lack of KS policy is hindering the sharing behavior of academic staff in general as well as sharing behavior when using the available web technology within Ethiopian higher education. Diriye (2019) confirms that setting effective KS policies and procedures is necessary for the smooth flow of knowledge. Akosile and Olatokun (2020) also report that the willingness of an individual to share knowledge is not necessarily enough to share knowledge; there has to be the presence of KS policies that affect KS among employees. The reward system was the other issue discussed with respondents to determine whether the university is using it as a motivational factor for academic staff to participate in KS practices. The respondents stated that both universities do not have a reward system for KS through web technology. Previous research in Malaysia found that reward systems can be used to cultivate sharing behavior among academics (Jeon et al., 2011).

The university's top management has a role in motivating academic staff to participate in KS. Akhavan et al. (2014) stated that top management puts in the necessary technological infrastructure, sets KS policy, acts as role models, and sets the direction or path for KS practices. Therefore, strong commitment from top management is essential to maintaining the continuity of KS within HEI. This study shows top management lacks commitment to motivating staff to use web technology. This lack of commitment hampers the KSB of academic staff. Akhavan et al. (2014). studied the failure factors of knowledge management systems in a pharmacy company context. Some of the failure factors disclosed by this study include a lack of top management commitment. Keramati and Azadeh (2007) also explained the lack of management commitment as a barrier to KS. Assefa et al. (2013) in the banking sector also show that top-management resistance is one of the barriers to effective KS practices among employees within the banking sector.

Based on the findings of this research, the researchers recommended the need for the following measures to improve the web-based KSB of academic staff and minimize the challenges they are facing right now: university management and a responsible body invest more in IT infrastructure, but on the other factors—system integration into teaching and learning practices, system accessibility, reward systems, top management commitment, and KS policy—they need improvement and require more work. Therefore, thoughtful efforts and mechanisms should be put in place to motivate academic staff to pursue a web-based KS. Therefore, we suggested the use of accessible and searchable systems, such that academic staff should be able to access the system outside and inside the campuses, existing web technologies should support online communication and discussion, and web technologies should be integrated into teaching and learning practice. The commitment of the top management should also be taken into account because providing IT resources and motivating academic staff to use these systems more or less depends on the top management. Aside from maintaining system integrity in teaching practice and providing a reward system, continuous training on how to use existing web technologies

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should be provided, for which a training plan can be developed to build the capacity of the academic staff. In general, university leaders should explain the benefits of KS via web technologies to the academic staff to increase the acceptance of web technology and train staff in web-technology tools to support KS practices. Academic staff must have technical skills and a positive perception of web technologies to ensure the successful use of web technologies for KS practices.

This study adds value to the existing literature by identifying factors that contribute to the successful use of web technology in the HEI context. Despite the presence of the KS challenges discussed and identified in the literature, there seem to be very few empirical studies focused on these challenges in the KS practices of academic staff, thus showing the importance of undertaking this type of research. The study also provides practical insights into the user behavior of web technology in developing countries such as Ethiopia. This study provides valuable recommendations for university management, academic staff, and researchers to understand the successful use of web technologies for KS practices. The fact that this study was conducted at an Ethiopian HEI, where there are various challenges, undermines the KS practices. The result of this study will assist university management, specifically Ethiopian higher education, in identifying the challenges that hinder academic staff from utilizing web technology for KS purposes. Therefore, in terms of the managerial implications of this study, Ethiopian public universities should enhance the quality of web technologies and simultaneously consider the factors that have been found to influence the use of web technologies for KS practices. Academic staff's social interaction through web technology will also improve their perception of web technologies, thereby improving their behavior toward using web technology for KS practice. Overall, this research provides novel insights and implications for higher education to ensure the successful use of web technologies for KS practices.

This paper also presents numerous areas for future research. First, this study focused on the Ethiopian public higher education context. Therefore, future studies could consider replicating this study from the private higher education perspective and in other countries' HEI contexts to understand and explore the KS challenges in different cultures. Second, this study used a semi-structured interview to investigate the KS practice of academic staff. The study did not examine the perception of students. Further research might consider this from the student perspective within Ethiopian HEIs. Finally, this study deploys a qualitative method through thematic analysis. Future studies could consider replicating this study from a quantitative method perspective with a larger sample size in a public university context.

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學術人員運用網頁技術進行知識分享之挑戰：以衣索比亞高等教育為例

Challenges in the Use of Web Technology on Knowledge-sharing Behavior of Academic Staffs: The Case of Ethiopian Higher Education

Gebremedhin Gebreyohans[1], David T. Croasdell[2], Million Meshesha[3]

摘　要

網頁技術是全球大學維持面對面知識分享挑戰的解方，但對於開發中國家如衣索比亞，應用網頁技術進行知識分享仍面臨許多挑戰。本研究探討影響學術人員運用網頁技術進行知識分享之因素，招募30位受訪者進行半結構式訪談，並以Nvivo質性資料分析軟體分析訪談資料。結果顯示，技術技能不足、缺乏與教學實踐整合的系統、缺乏意識、欠缺合適獎勵制度、高層主管不投入、缺乏知識分享政策，以及知識地圖不足是主要挑戰。這些結果提供知識分享實踐的證據與加強高等教育知識分享實踐的洞見，對於完整了解其中挑戰亦有所貢獻，將使學術人員、大學管理階層與高等教育機構受益。後續可考慮改採私立高等教育觀點，或以量化方法就更大的公立高等教育樣本再現本研究。

關鍵字：知識分享挑戰、網頁技術、高等教育、學術人員、科技接受模式

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