To Share or Not to Share? Perceptions of University's Faculty Members Regarding the Sharing of their Teaching-related Knowledge

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***Abstract* - While the concept of knowledge management (KM) has been widely discussed and implemented in a large number of commercial organizations within the Saudi context, the topic of applying KM to effect in higher education institutions (HEIs) has received limited attention. This is despite the fact that there is a recognition of the importance of managing knowledge in such HEI environments. Thus, this research was designed to identify academics' perceptions about the sharing of teaching-related knowledge within Saudi universities. An investigative study was conducted by collecting qualitative data via 22 semi-structured interviews with academics from different Saudi universities to capture their perceptions. The qualitative data show that the academics have clear ideas about several potential benefits of managing teaching-related knowledge, despite the challenges they have faced when managing their knowledge using the currently existing KM approaches. This study holds considerable promise in relation to developing an effective web-based KM approach that fits the academics' needs.**

Keywords - knowledge sharing; knowledge management; higher education institutions; teaching-related knowledge

I. INTRODUCTION

The quality of higher education institutions (HEIs) and the ability of universities to perform their missions are intimately linked to the quality and commitment of their faculty members, and this, in turn, depends on the quality of professional development within the faculty. In order to achieve this, Saudi universities are seeking to optimize their investments in the knowledge of their academics and turn this into a productive force that contributes to the development of academic performance and consequently the improvement of institutional performance. One proposal focused on improving academics' performance is that of managing the sharing of academics' teaching-related knowledge across a faculty of individuals. Knowledge management (KM) is the process of documenting, retrieving, and applying an organization's (in this case, a university's) knowledge to promote staff members' learning and consequently enhance their performance and the achievement of the organization's goals [1].

Rowley [2] and Seonghee and Boryung [3] stated that HEIs are engaged in significant levels of teaching-related knowledge production via faculty members, and so it is vital to manage this knowledge effectively. Managing such teaching experience is effective for, amongst other things, promoting access to published knowledge sources within the academic community, improving the curriculum development process, and achieving efficiencies in the searching of instructors' own personal knowledge [4]. Without exchanging TPs, academics will continue to reinvent practices repeatedly – the result of a situation whereby there is no way to leverage experience and expertise.

Researchers who are interested in issues relating to the operation of Saudi universities found a low level of KM practices among the faculty members [5]. However, there is a lack of in-depth investigation studying the causes of such issue. In addition, exploring the literature shows that previous studies that have dealt with KM in HEIs have focused only on generic KM practices. Practices relating to knowledge sharing vary across contexts [6]. There is a lack of research that explores specific knowledge contexts, e.g., the teaching practices (TPs) undertaken by academic instructors which, arguably, are critical for Saudi HEIs [7-9]. Thus, an in-depth research study is essential in order to explore the management of TPs in Saudi HEIs. This paper seeks to address the following research question: What are the academics' perspectives regarding managing TPs in Saudi HEIs?

II. RELATED WORK

Teaching activities result in the creation of remarkable amounts of expertise that must be translated into course-related resources in order to produce learning activities that will satisfy students' needs [10]. The accumulation of teaching expertise gained through many years shapes the teachers' TPs. The types of TPs shared among academic staff seem to represent a combination of explicit (know-what) and tacit (know-how) knowledge about teaching a specific subject. The "know-what" is essentially the knowledge concerning the subject matter (content knowledge), created and organized by members of academic staff; it is designed to be transferred to students so that they are able to learn and master the topics in question [3]. Such knowledge can be expressed in words and sentences and is relatively easily articulated and recorded. On the other hand, in terms of tacit knowledge, KM theorists contend that "know-how" is that which is preserved in the minds of, here for example, academics. This type of knowledge can be classified into pedagogical

knowledge which means the knowledge about the processes and practices, or methods of teaching and learning used for delivering content knowledge to students.

In the context of Saudi universities, most novice academic staff begin their teaching careers without any formal pedagogical preparation, and hence they often lack effective teaching skills. Although they may be very knowledgeable with regard to their own discipline, novice faculty members often lack formalized training in the fundamentals of pedagogy, including learning theory, instructional methods, classroom management techniques, and approaches to assessment and the evaluation of learner performance [8]. On the other hand, most of the senior academics tend to teach in the same way that they were taught, many years ago, and to test in the same way they had been tested [9]. Such factors are likely to affect the quality of education within Saudi HEIs negatively due to the inconsistencies in teaching that these create [11]. This is despite the availability of many remarkable examples of good TPs applied within the Saudi HEI context.

Managing internal TPs can be very helpful in creating cohesion within a faculty which has many different departments, facilitating the sharing of TPs among faculty members doing similar, though not identical, work [12]. Also, a particular academic may have specific expertise which, if it were made more generally available, could be applied to a number of different courses. Therefore, it can be said that identifying, sharing, and reusing good TPs means that achievements attained in one part of the university can be duplicated across all others. This kind of activity may result in faculty members being able to generate teaching innovations and improvements.

According to Loucopoulos and Karakostas [13], it is important to understand academics' knowledge sharing behavior in order to explore whether their current KM approaches are adequate and effective for supporting the management of TPs. Knowledge sharing behavior relates to when, why, how, and how much an individual shares knowledge with others [14], and differs depending on the type of knowledge involved and the use being made of it. Since this present study aims to explore a type of context-specific KM that has not been investigated before, the researchers believe it is crucial to understand the knowledge sharing behavior, in the subjects' environment, in as precise a way as possible. This is, in particular, in order to identify which strategies work well for academics and the features offered by advanced technologies that have the potential to support instructors' KM processes. Thus, so as to provide an effective, new approach which can support instructors' KM processes.

III. METHODOLOGY

An investigative study was conducted in order to explore the perceptions of academics regarding their experience of managing their own TPs using the currently existing approaches. It also aims to understand how instructors are currently recording, storing, searching for, and evaluating TPs.

Several face-to-face semi-structured interviews were conducted with 22 academics from different Saudi universities. The method used to select the study sample was convenience sampling due to the time and financial challenges [15].

The interviews consisted of a number of open-ended questions selected on a pragmatic basis in order to facilitate interviewees' reflections on their knowledge sharing experience. In order to collect the qualitative data set, the researcher sent invitation emails in-person to academics working in different Saudi Universities requesting their participation. The academics' email addresses were obtained from the heads of different faculties. Instructors interested in participating in the study were encouraged to contact the researcher by responding to the email. Each interview was scheduled at a convenient date/time and location for each participant. The location of the interviews was arranged by the interviewee, and some interviews were conducted on campus while others were conducted outside the university. Audio recordings were used when conducting the interviews in order to capture every word of each interview [16]. Academics were informed that they could stop and withdraw from the interviews at any point in the study, pursuant to the ethical considerations. The validated transcripts of all the participants' interviews were used as actual empirical data and were uploaded to MaxQDA.

Since the aim of the present study was to explore emerging concepts related to the main research question rather than to quantify concepts, inductive thematic analysis was applied [17].

A. Analysis of Qualitative Data

Table I gives details of the demographic data of participants who were interviewed.

TABLE I. PARTICIPANTS OF THE INVESTIGATIVE STUDY (N=22)

	Name	Position	Faculty	Years of experience	University Name
1	Academic A	Professor / Head of Department	Business	More than 10 years	KSU
2	Academic B	Professor / Head of Department	Science	More than 10 years	KSU
3	Academic C	Professor / Head of Department	Computer Science	More than 10 years	KSU
4	Academic D	Professor / Head of Department	Education	More than 10 years	KSU
5	Academic E	Associate Professor	Science	More than 10 years	PNU
6	Academic F	Associate Professor	Engineering	More than 10 years	KSU
7	Academic G	Associate Professor	Computer Science	More than 10 years	PNU
8	Academic H	Associate Professor	Science	6-10 years	PNU
9	Academic I	Assistant Professor	Business	6-10 years	KSU
10	Academic J	Assistant Professor	Business	6-10 years	KSU
11	Academic K	Lecturer	Computer Science	2-5 years	KSU
12	Academic L	Lecturer	Science	2-5 years	PNU
13	Academic M	Lecturer	Computer Science	6-10 years	PNU
14	Academic N	Lecturer	Education	2-5 years	KSU
15	Academic O	Lecturer	Science	2-5 years	KSU
16	Academic P	Lecturer	Science	6-10 years	PNU
17	Academic Q	Lecturer	Computer Science	2-5 years	PNU
18	Academic R	Lecturer	Computer Science	Less than 2 years	PNU
19	Academic S	Assistant Teacher	Computer Science	2-5 years	KSU
20	Academic T	Assistant Teacher	Linguistics	6-10 years	PNU
21	Academic U	Assistant Teacher	Science	Less than 2 years	PNU
22	Academic V	Assistant Teacher	Computer Science	2-5 years	KSU

KSU: King Saud University **PNU**: Princess Nourah bent Abdulrahman University

The analysis of the qualitative data shows that the academics were aware of the importance of sharing TPs.

"Transferring teaching practices within faculty will help other academics, who are involved in designing a course syllabus, in avoiding error occurrence that that might affect the quality of teaching outcomes." (Academic B)

"…finding ways to encourage students to think logically while solving the lab sheet instead of asking for the tutor's assistance." (Academic R)

Without the sharing of others' TPs, novice academics reported that they often struggled to find information concerning new topics.

"...I spend more than four hours of my own time every day on building my knowledge and skills." (Academic V)

"I depend on my own knowledge to find solutions to problems that the students come across. I have enrolled in many training courses, but sometimes I end up applying the same old methods that I am familiar with." (Academic F)

In response to the question "How do you document your TPs?", most instructors (n=19) stated that they rarely document their TPs in an appropriate format. Once they had discovered the required knowledge, they would *"... apply it directly in the classroom without recording it for later use."* (Academic N)

Furthermore, academics showed dissatisfaction with the current approach of documenting teaching-related knowledge using static text formats such as Word documents provided by the Quality Assurance (QA) department at the end of each academic term. They stated that these documents have various formats and different structures and require a great deal of effort to fill in.

"The forms are complex and not designed to fit with academic needs. I sometimes avoid filling in the QA documents or ignore some fields in the forms." (Academic S)

Although the academics did appear to record and submit their teaching experiences to the QA department, *"... accessing recorded teaching experiences is restricted to the quality assurance team; you need to send an email to them to get access to a specific document; this takes time and effort."* (Academic K)

In response to the question "How do you search for teaching-related knowledge in your university?", the majority (n=20) look for TPs by asking experts directly during face-to-face conversations; or, if the required knowledge cannot be found internally, then academics will frequently turn to external resources such as commercial search engines.

"Mostly, this is done in informal ways over coffee or during lunchtime. I don't think there are any specific forms that are used to exchange teaching knowledge within the department itself." (Academic A)

"I sometimes use Google to find what I want instead of interrupting other academics during work hours." (Academic K)

Academics (n=14) reported that working in different locations presented challenges in terms of sharing TPs through face-to-face interaction due to the geographical distancing and social constraints considered necessary in Saudi culture.

"We need to go through a long process to obtain the knowledge we want, from sending an email to arrange a meeting to travelling to the campus to meet the expert." (Academic K)

"... as a female lecturer, the only way to communicate with expert academics in the male department is through sending emails due to gender segregation. I usually have to wait for a long period of time for a response." (Academic C)

Because teaching-related knowledge is usually obtained on the go and the documented TPs often lack structure and/or contextual information, the application and reuse of such knowledge are negatively affected.

"There is a lack of detail about when, where and how to apply a given teaching practice because the exchange of knowledge often occurs on the go." (Academic P)

Most instructors (n=19) claimed that they were reluctant to apply TPs obtained from face-to-face interaction and QA forms due to the difficulty related to assessing the applicability of shared knowledge in terms of its usefulness for achieving a certain outcome. Therefore, they

"I am not sure whether the knowledge that has been shared is credible, whether it has been applied before or whether it will prove its usefulness in achieving a certain outcome. I prefer to keep my teaching style the same rather than convert my classroom into a trial and error session." (Academic J)

Furthermore, the results also revealed that the most common issue, mentioned by the largest number of respondents, was the lack of motivation to share their TPs with others. Most academics complained that they had never received any acknowledgment in return for sharing knowledge through face-to-face communication or for submitting QA documents. Thus, knowledge contributors were reluctant to participate in knowledge sharing activities.

"I would share more if I became known amongst my co-workers as an active member." (Academic L)

"It is an extra task. I will not spend time sharing my knowledge without a return. I am not looking for monetary reward. What I am looking for is acknowledgment." (Academic O)

The academics were asked if they had used general Web applications to share or search for knowledge related to the subject they teach. The purpose of this question was to understand the academics' opinions concerning the applicability of Web 2.0 features for a KM approach. Nearly all instructors had prior experience of employing Web applications, although this had been limited to personal use — for example, accessing news, weather, games, travel information or for shopping.

"I use Twitter to post knowledge related to my experience in different aspects of life. I do not share work-related knowledge at all." (Academic E)

Difficulties assessing the credibility and usefulness of knowledge retrieved were further concerns instructors raised on the subject of searching for knowledge using Web applications.

"There are plenty of blogs and sites that contain misinformation." (Academic J)

Reservations over applying knowledge retrieved from Web applications were clearly demonstrated through the comments of academics.

"Even if I find the required teaching practice in a Web application, I usually read it and then feel disinclined to use it due to lack of information about how to apply it and what the main outcome of applying it in my classroom would be." (Academic A)

Academics were also asked in the interviews to specify what they needed in order to enhance the management of TPs, so that it could be understood to what extent they required new tools to support them in KM practices. Although instructors expressed a strong willingness to use a web-based system for KM practices, that willingness was very much contingent on the potential benefits such a system would offer and on its simplicity.

"I think that instructors are more likely to use it as long as it's just simple and user-friendly." (Academic J)

"The tool must be somewhere central, so everybody can access it to save time searching for particular knowledge." (Academic K)

"The documentation tool must be designed to fit my needs. Long text-based forms will not be the solution." (Academic O)

"A function to help me organize the content of knowledge in a constant format" (Academic L).

"... If anyone says thank you for sharing your experience, which helped me when teaching the subject. I think this kind of recognition is incentive enough." (Academic B).

IV. Discussion

The analysis of the demographic data revealed that both male and female academics whose experience ranged between novice and experts and who worked in various faculties and disciplines were involved in the investigative study to ensure the obtaining of accurate and comprehensive results for this study.

There were five key themes relating to instructors' perspectives towards the sharing of TPs.

A. Instructors' Perspectives Towards Managing TPs

The analysis of the quantitative data shows that the academics were aware of the importance of sharing TPs, such as the methods for teaching a specific subject and also subject-focused resources. They reported that there would be benefits in exposure to discipline-specific content relevant to their own areas and to other knowledge in different areas in their faculty, including potential improvements in curricular resources and classroom practices. It can be said that instructors are willing to share knowledge with those who have a common interest and share the same vision.

Without the sharing of TPs, academics expressed their concern regarding the depth and breadth of their subject knowledge. They reported that they had to spend several hours of their private time trying to upskill in terms of their knowledge of their subject. Furthermore, academics reported on the challenge of developing and promoting the pedagogical approaches they needed to support their students and classroom practices.

Therefore, it can be concluded that university academics perceived sharing content knowledge and pedagogical knowledge as crucial activities and vital sources of learning which could enhance teaching quality.

B. Current KM practices

With regard to existing KM approaches adopted in Saudi universities, the findings demonstrated that the degree of TPs sharing participation that took place within Saudi universities is low due to the absence of effective means for doing this other than the occasional face-to-face meeting. It seems that academic departments do not currently offer their staff any formal methodology supporting the exchanging of TPs. The traditional human-centric approach is the current predominant medium adopted amongst instructors for knowledge sharing. It focuses on the use of human interaction for transmitting knowledge via face-to-face meetings, whereby interaction depends on individual communication often via chance meetings which could be infrequent. The majority look for TPs by asking experts directly during face-to-face conversations; or, if the required knowledge cannot be found internally, then academics will frequently turn to external resources such as commercial search engines.

Therefore, it can be concluded that most of the knowledge seeking and knowledge contribution appeared to occur on a direct one-to-one basis in an informal context with an identifiable colleague, although informal conversations are usually about social or personal topics.

When academics were asked how they documented and stored their TPs, most of them admitted that they retained their own knowledge in their minds until asked about it. They stated that they rarely document their TPs in an appropriate format. Course coordinators reported that knowledge related to subjects they teach is typically captured using static text formats such as Word documents provided by the QA department at the end of each academic term. The created text-based documents are stored in a QA online drive and made accessible for official use, while copies are stored locally on academics' personal hard drives.

C. Difficulties in managing TPs using current approaches

The analysis of the qualitative data led to the identification of the following obstacles that might affect the effective sharing, obtaining and reusing of knowledge among academics using the existing KM approaches: poor knowledge documentation, difficulties accessing experts and expertise, difficulties assessing the applicability of knowledge, and lack of motivation.

1) Poor knowledge documentation and storage

Although knowledge documentation is often performed by filling in the static text QA forms, the majority exhibited dissatisfaction with the documents' structure and format. Academics (knowledge contributors) reported that the forms are composed of a number of text boxes, each covering a specific area of course syllabi. The QA forms are complex in terms of their structure and length; therefore, academics sometimes avoid filling in the documents or ignore some fields. Omitting a valuable part of a form might result in a corrupted, unclear, incomplete version of knowledge that is difficult to reuse by others.

Knowledge obtained through face-to-face interaction is not recorded; it is just preserved in academics' minds, as stated in the interviews. Because teaching-related knowledge is usually obtained on the go, academics argued that they rarely applied such knowledge in their classrooms due to lack of details about when, where, and how to apply a teaching practice. Knowledge contributors, who are usually busy during working hours, are likely to omit valuable elements of the knowledge they share; this results in a high level of misunderstanding which could inhibit the application and reuse of knowledge.

A great deal of duplication of effort is inherent in these situations. This detracts from the amount of time these academics can devote to helping students, and/or to research [1]. In absolute terms, such redundancies should not occur, and their incidence can be reduced when knowledge is shared, when everybody knows who is working on what, and when those within similar disciplines can work together to develop better TPs.

2) Difficulties accessing experts and expertise

Since the face-to-face approach can reach only a limited number of people at limited places and times, the results of the qualitative data highlighted the difficulties in accessing other academics who work in different departments and with those who are of a different gender, for knowledge sharing purposes. Saudi Arabia is a religious country, and Islam is reflected in the practices involved with education and in the structures of the universities — where male and female academics are segregated into separate campuses [18]. The separation into female and male departments and the fact that the academics are geographically dispersed hinder communication between academics. In addition, QA forms are not easily accessible by others; access is limited to just a few individuals. All results in the ineffective application of KM and in imbalances in teaching quality.

3) Difficulties assessing the applicability of shared knowledge

One of the key issues that arose in interview discussions was that academics were reluctant to apply TPs obtained from face-to-face interaction and QA forms due to the difficulty related to assessing the applicability of shared knowledge in terms of its usefulness for achieving a certain outcome; therefore, they claimed they lacked the courage to reuse other academics' knowledge in their classrooms.

4) Lack of motivation

The most common issue, mentioned by the largest number of respondents, was the lack of motivation to share their TPs with others. Most academics complained that they had never received any acknowledgment in return for sharing knowledge through face-to-face communication or for submitting QA documents. Thus, knowledge contributors were reluctant to participate in knowledge sharing activities unless they received rewards in return. This result could be attributed to the fact that the academics frequently seemed to view knowledge sharing as an additional and supplementary procedure. Most academics tend to focus on the fulfilling of their teaching and other responsibilities, which are closely tied to their performance evaluations, and which they, therefore, find beneficial in comparison to sharing knowledge with colleagues. A lack of motivation has been identified as a significant barrier to knowledge sharing behavior and is a challenge in relation to the successful application of KM [19, 20]. Most academics showed a tendency to want to share their knowledge when they perceived that the process of sharing would enhance their social status and reputation within their professional network.

D. Perceptions Towards the Use of Web Technologies for KM

Results obtained from the qualitative analysis show that although the majority of academics have never faced difficulties in using Web applications, only a few would use such applications for sharing their TPs. Academics stated in the interviews that they only use Web applications such as Twitter for sharing personal experiences. Additionally, academics believed that Web 2.0 applications were unreliable channels for searching for academic knowledge. This was related to the issue of untrusted sources because there is a huge amount of information on the Web which is not backed by evidence.

It can be concluded that there is a tendency among academics to set up boundaries between professional responsibilities and personal connections. Thus, academics believed that the available Web applications were unreliable channels for sharing and searching for academic knowledge.

E. Perceptions Towards the Design of a New KM Tool

It is interesting to note that all the academics who have participated in the study expressed a strong willingness to use an internal task-oriented platform for managing TPs in the future. Two factors were emphasized by most academics that would impact their willingness to use a new KM approach for teaching-related KM practices: the simplicity and usefulness of the new KM approach. Many academics said they would consider a tool that employs techniques that support the documentation of complete, clear, and consistent TPs in a single (if virtual) "place," which can be accessed anytime from anywhere in order to facilitate the management of TPs between academics in different departments (male and female) and among different campuses. Academics also needed a function that classifies knowledge based on faculties in order to facilitate the search process. Functions that motivate academics to share their knowledge also received a reasonably high number of responses. Furthermore, academics reported the need for functions that enabled them to assess the quality and usefulness of posted

knowledge. This clearly indicates that there is a requirement to integrate some of the features of Web 2.0 platforms in a new KM approach.

V. CONCLUSION

The investigative study involved identifying the research problem in depth by collecting qualitative data via several semi-structured interviews with 22 academics from different Saudi universities. The aims were to explore the current KM activities and the possibility of implementing new technologies.

The results show that the academics have clear ideas about several potential benefits of managing TPs, despite their challenges when managing their knowledge using the currently existing KM approaches. It can be concluded that the currently existing KM approaches taken at Saudi universities offer academics neither useful nor usable methods for managing TPs. These insights highlight the importance of developing a new KM approach that incorporates Web technologies to deliver a better KM experience for academics.

The main contribution centres on exploring the academics' perspectives on managing TPs in HEIs and the currently existing KM practices via an investigative study. This, it is believed, is an important activity, given that previous studies have highlighted the importance of managing knowledge, but, crucially, did not extensively investigate any actual academics' knowledge sharing behaviors. The investigative study found that a tool that employs functions that support, in a practical way, and motivates, the documentation, storage, retrieval, evaluation, and reuse of TPs could offer a better KM experience for academics, overcoming the limitations of the existing KM approaches. It should be remembered that understanding users' actual, real-world context can significantly enhance design utility [20].

Therefore, the results of this present study provide reliable insights which may assist the management of Saudi HEIs in understanding their academic staff's knowledge sharing behaviors and so make appropriate decisions to establish and apply appropriate strategies and procedures to support KM activities among their academics. Effective management of TPs increases the overall quality of teaching, which is likely to lead to a marked improvement in work processes, helping the universities achieve their performance objectives.

Although we have indeed derived helpful insights, here, the primary limitation of this research is that the study involved 22 interviews with academics. Recruiting academics who work in universities is difficult due to their busy schedules. However, the sample constitutes a good representative sample as both male and female academics whose level of experience ranged between novice and expert and who worked in various faculties were involved in the study. This ensured the obtaining of accurate and comprehensive results. Future directions for this research may include the development of a KM approach in light of the resulting findings to enhance TP sharing among academics in universities.

REFERENCES

[1] A. Aurelie Bechina Arntzen, L. Worasinchai, and V. M. Ribière, "An insight into knowledge management practices at Bangkok University," *Journal of Knowledge Management,* vol. 13, no. 2, pp. 127-144, 2009.

[2] J. Rowley, "Is higher education ready for knowledge management?," *International journal of educational management,* vol. 14, no. 7, pp. 325-333, 2000.

[3] K. Seonghee, and J. Boryung, "An analysis of faculty perceptions: Attitudes toward knowledge sharing and collaboration in an academic institution," *Library & Information Science Research,* vol. 30, no. 4, pp. 282-290, 2008.

[4] J. E. Hewitt, "Blended learning for faculty professional development incorporating knowledge management principles," Nova Southeastern University, Florida, 2016.

[5] F. Alshehry, "The role of academic leadership in developing knowledge sharing as perceived by members of the faculty at King Khalid University," King Khaled University, 2017.

[6] S. Jeon, Y. G. Kim, and J. Koh, "An integrative model for knowledge sharing in communities-of-practice," *Journal of knowledge management,* vol. 15, no. 2, pp. 251-269, 2011.

[7] M. Ismail, and N. Ashmiza, "Key determinants of research-knowledge sharing in UK higher education institutions," University of Portsmouth, 2012.

[8] J. T. Abbitt, "Measuring technological pedagogical content knowledge in preservice teacher education: A review of current methods and instruments," *Journal of Research on Technology in Education,* vol. 43, no. 4, pp. 281-300, 2011.

[9] A. A. Qureshi, "Improving teaching effectiveness: The influence of workshops at King Abdulaziz University in Saudi Arabia," University of Denver, 2006.

[10] L. A. Mills, G. Knezek, and F. Khaddage, "Information Seeking, Information Sharing, and going mobile: Three bridges to informal learning," *Computers in Human Behavior,* vol. 32, pp. 324-334, 2014.

[11] D. Greatbatch, and S. Tate, "Teaching, leadership and governance in Further Education," *Social Sciencie in Government*, pp. 1-115, 2018.

[12] T. Williams, "How do organizations learn lessons from projects—And do they?," *IEEE Transactions on engineering management,* vol. 55, no. 2, pp. 248-266, 2008.

[13] P. Loucopoulos, and V. Karakostas, *System Requirements Engineering*, New York, NY, USA: McGraw-Hill, 1995.

[14] M. Oliveira, C. M. Curado, A. C. Maçada, and F. Nodari, "Using alternative scales to measure knowledge sharing behavior: Are there any differences?," *Computers in Human Behavior,* vol. 44, pp. 132-140, 2015.

[15] M. Denscombe, *The good research guide: for small-scale social research projects*: McGraw-Hill Education (UK), 2014.

[16] J. Lazar, J. H. Feng, and H. Hochheiser, *Research methods in human-computer interaction*: Morgan Kaufmann, 2017.

[17] J. Cohen, *Statistical power analysis for the behavioral sciences*: Academic press, 2013.

[18] H. Alotaibi, R. Crowder, and G. Wills, "Adoption of Web based Knowledge Sharing system amongst Academic Staff," *Journal of Advanced Management Science,* vol. 5, no. 1, pp. 57-63, 2017.

[19] L. Chen, A. Baird, and D. Straub, "Why do participants continue to contribute? Evaluation of usefulness voting and commenting motivational affordances within an online knowledge community," *Decision Support Systems,* vol. 118, pp. 21-32, 2019.

[20] A. Kankanhalli, B. C. Tan, and K.-K. Wei, "Contributing knowledge to electronic repositories: an empirical investigation," *Management Information Systems Quarterly,* vol. 29, no. 1, pp. 113-143, 2005.