Are faculty members ready? Individual factors affecting Knowledge Management readiness in Universities

Laila Naif Marouf*
Dept. of Library and Information Science
College of Social Sciences
Kuwait University
Jamal Abdul Nasser St, Kuwait
laila.marouf@ku.edu.kw

Naresh Kumar Agarwal
School of Library and Information Science
Simmons College
300 The Fenway, Boston MA
agarwal@simmons.edu
Tel: + 1 617 521 2836

Abstract. Knowledge Management (KM) provides a systematic process to help in the creation, transfer and use of knowledge across the university, leading to increased productivity. While KM has been successfully used elsewhere, universities have been late in adopting it. Before a university can initiate KM, it needs to determine if it is ready for KM or not. Through a web-based survey sent to 1263 faculty members from 59 accredited Library and Information Science programs in universities across North America, this study investigated the effect of individual factors of trust, knowledge self-efficacy, collegiality, openness to change and reciprocity on individual readiness to participate in a KM initiative, and the degree to which this affects perceived organizational readiness to adopt KM. 157 valid responses were received. Using structural equation modeling, the study found that apart from trust, all other factors positively affected individual readiness, which was found to affect organizational readiness. Findings should help universities identify opportunities and barriers before they can adopt KM. It should be a useful contribution to the KM literature, especially in the university context.

Keywords: knowledge management, knowledge sharing, readiness assessment, trust, knowledge self-efficacy, collegiality, openness to change, reciprocity, individual factors, colleges, universities

1 Introduction

Universities may be described as 'loosely-coupled' organizations with sub-systems partially connected to each other, and maintaining their own identity and autonomy (Shoham & Perry, 2009). While the primary role of a university [1] is the pursuit of knowledge, it has various imperatives ranging from financial sustenance and growth, to student recruitment and retention, to faculty and staff morale to research productivity and reputation. However, universities are often

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[1] We use the term university to include colleges and universities of all types and sizes

characterized by unclear or contradictory goals, a lack of consistency and an inability to reach agreement (Cohan, March, & Olsen, 1972; Shoham & Perry, 2009). Cohan, March, & Olsen, (1972) went so far as to describe a university as an 'organized anarchy'. Apart from these inherent difficulties, universities are grappling with change. There is increased competition from other places that are able to award a larger number of scholarships or interest-free loans, and/or provide a lower cost of education. Also, with the advent of online education and Massive Open Online Courses (MOOCs), the traditional geographical base of universities is being attracted by far-off universities. Advances in information and communication technologies, social media and use of smartphones and tablets has further changed the status quo in how students choose to learn (Agarwal & Marouf, 2014).

Individual faculty members in these universities face various challenges as well. While universities expect publications from faculty, there is often little to no guidance in the form of research groups, mentoring, collaboration or regular research meetings. Young professors have solitary, lonely journeys in their tenure process. Emphasis on solo-authored articles in some places deters collaboration. Also, limitations on where to publish limits the people one can collaborate with. There is no easy mechanism to know what faculty across campus are currently working on (as opposed to the static research areas listed on websites), and areas where they need help (either in a certain domain or method of data analysis). Open access repositories are not thriving in most places, with technology and systemic barriers to contribution in these repositories (Agarwal & Marouf, 2014).

There are challenges in areas of service to the university as well. The work done by committees is not always transparent to those outside them, until a decision is reached. There is not enough space for informal in-flux-knowledge to be shared, and where people can participate and help in shaping. There is room for much greater interaction and synergy between university administration, faculty, staff and students and between the different units or schools across campus. It is in this environment that universities must become agile and respond to change in a seamless and continuous manner (Agarwal & Marouf, 2014). Tikhomirova *et al.,* (2012) call these 'smart universities'. Knowledge Management provides a tested methodology for college and universities to deal with these challenges. KM would help to enhance intra-organizational processes and strategy in a university (Pornchulee, 2001), and its reputation by streamlining the process of generating research (Kidwell, Linde, & Johnson, 2000; Ahmadi & Ahmadi, 2012) and promoting collaborations and innovation. As a thriving knowledge-sharing culture makes it easy for people to ask what they do not know, KM implementation in universities would help increase faculty and staff morale, and create a culture that attracts diverse and talented body of students, thus providing an enriching student experience. All these would contribute to the strategic goals of the college leading to enhanced reputation and greater financial stability.

A number of studies have looked at knowledge management in the context of universities spanning North America (Rowley, 2000) to the Middle East (Al-Bastaki & Shajera, 2012; Ahmadi, 2012; Matin & Kashani, 2012) to Asia (Abdullah *et al.*, 2008; Arntzen, Worasinchai, & Ribiere, 2009; Islam, Ikeda, & Islam, 2013) to Asia-Pacific (Blackman & Kennedy, 2009). These studies have looked at various facets from KM awareness to readiness to KM initiatives and adoption,

and the factors enabling and hindering KM adoption. APQC has developed a KM capability and assessment tool for organizations to validate and target their programs' issues, gaps and strengths (O'Dell & Hubert, 2011, p.37) which can be applied to colleges and universities. Other instruments (e.g. by Moffett & McAdam, 2006; Al-Bastaki & Shajera, 2012) are targeted to the university context.

Agarwal & Marouf, (2014) came up with a 10-step process for KM initiation in universities. They state that before you can initiate KM, the university needs to determine if it is ready for KM. However, they just said that surveys and interviews would be required to know the current state i.e. step 3 of their ten steps. It is not clear what would such an instrument would look like. What do faculty, staff and students perceive is the state of readiness in their university?

To address this gap, a survey instrument was designed to study if faculty feel whether their universities are ready for KM adoption or not. While there could be both individual (trust, knowledge self-efficacy, etc.) and organizational factors (culture, structure, technology, etc.) relating to whether universities are ready for KM or not, this study focused on individual factors. Through a web-based survey of different universities, this study will investigate the effect of individual factors such as trust, knowledge self-efficacy, collegiality, openness for change and reciprocity on individual faculty readiness to participate in a KM initiative, and the degree to which this affects perceived organizational readiness to adopt KM.

The specific research questions investigated were as follows: *How do trust, knowledge self-efficacy, perceived degree of collegiality and openness for change affect individual readiness to participate in a university KM initiative? How does individual readiness to participate in a KM initiative affect the perceived organizational readiness to adopt KM in the university?*

The faculty members surveyed were from Library and Information Science Programs accredited by the American Library Association. These were mostly North American universities.

Findings should help universities identify opportunities and barriers before they can adopt KM. The readiness assessment instrument that has been designed can be adopted in other studies investigating KM in universities. Determining readiness will help identify the right approach for KM to be used by the university. Unless individual faculty members are ready, no amount of organizational initiative is going to be successful. It should also be a useful contribution to the KM and readiness assessment literatures, especially in the context of colleges and universities.

2 Literature review and Hypotheses

Theoretical framework

Readiness assessment

A large number of studies in KM have been done looking at readiness assessment in different organizations. These include Mamaghani *et al.,* (2011), Aujirapongpan *et al.,* (2010), Wild & Griggs, (2008), Holt *et al.,* (2007), Al-Busaidi & Olfman, (2005), Wong & Aspinwall, (2005) and

Wong, (2005). Agarwal & Marouf, (2014) write that the focus of KM readiness assessment must be to answer questions related to four areas primarily – people, culture, processes and information technology. We may categorize these factors into two broad types – organizational factors and individual factors. Here, people would constitute the individual factors, while the other three areas would be part of organizational factors. Both the organizational and individual factors may affect whether organizations are ready for KM or not. The organizational factors of culture, processes/structure and technology (Aujirapongpan *et al.*, 2010) may be further broken down as knowledge-culture, knowledge strategy, organizational infrastructure, technical infrastructure, management support, vision clarity, reward policy and economic return on KM success, etc. (Mamaghani *et al.*, 2011). Individual factors may include trust, openness to change, expectancy, motivation, performance and effort i.e. how much effort am I willing to put into this (Razi & Karim, 2011), etc. which determine if employees within an organization view KM favorably or not.

Readiness assessment in universities

There have been fewer studies investigating KM readiness in universities. Rowley, (2000) looked at Canadian universities, saw technology as a facilitator and suggested revisions in organizational structures and reward systems. Abdullah *et al.,* (2008), in the context of six Malaysian universities, had similar findings where they found technology ready to facilitate KM, but knowledge sharing culture and organizational structure as yet to reach the optimal level. Mohayidin *et al.,* (2007) studied eight universities in Malaysia. They found that while a change in individual human factors, and in culture was difficult, they significantly affect the success of KM projects. While Fathollahi *et al.,* (2010) looked at technology and culture in an Iranian university and found a favorable culture for KM, Hosseini, (2007) found technology to be more suitable than culture in individual faculties.

Review of variables

Figure below shows the variables of interest in this study, and the relationships between them (hypotheses). The model includes one dependent variable (perceived organizational readiness to adopt KM), one mediating variable (individual readiness to participate in a KM initiative) and five independent variables (individual factors of trust, knowledge self-efficacy, perceived degree of collegiality, openness for change and reciprocity).
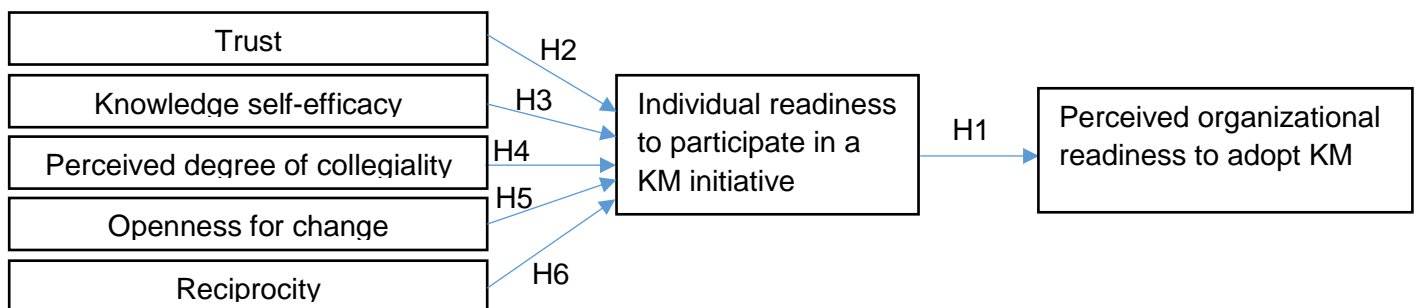
Figure 1 Research Model

Perceived organizational readiness to adopt KM (dependent variable)

The degree of organizational readiness to adopt KM may be defined as its preparedness for effective knowledge sharing (and other phases of the KM cycle such as knowledge capture and creation, knowledge use, etc.) before a KM system is implemented (Azhdari, Mousavi Madani, & ZareBahramabadi, 2012). Mohammadi *et al.,* (2009) define it as the ability of an organization, department or work group to successfully adopt, use and benefit from KM. KM projects require significant organizational change (Davenport & Prusak, 1998). Organizational change is always difficult because resistance to change is often dramatic and immediate (Holt, Bartczak, Clark, & Trent, 2007). Thus, 'readiness' is a necessary pre-condition for an organization to succeed in facing organizational change (Holt, 2000). KM initiatives often start with the leaders and those involved asking, "Is my organization ready?" (Holt, Bartczak, Clark, & Trent, 2007). Measurement of readiness would help leaders know where to start as they try to introduce KM (Holt *et al.*, 2007). In this study, we define perceived organizational readiness to adopt KM as the degree to which an individual perceives whether and how ready one's organization-as-a-whole is to adopt KM. We can measure this as low, medium or high degree of perceived readiness. This perception of readiness, in turn, might be based on a number of factors, which are discussed in the sections below.

Individual readiness to participate in a KM initiative (mediating variable)

Knowledge management involves many phases such as knowledge capture and creation, knowledge sharing and transfer, and knowledge application and use, among others (Dalkir, 2013; Agarwal and Islam, 2014). Of these, knowledge sharing is perhaps the most important indicator of one's willingness to participate in KM as knowledge resides within individuals who create, access and apply knowledge in carrying out their tasks (Bock, Zmud, Kim, & Lee, 2005). Thus, the movement of knowledge across individual and organizational boundaries, repositories, routines and practices is ultimately dependent on employees' knowledge sharing behaviors (Bock, Zmud, Kim, & Lee, 2005). According to the Theory of Planned Behavior (Fishbein & Ajzen, 2011), intention is the most consistent indication of an individual's readiness to engage in a behavior. In this study, we operationalize individual readiness to participate in a KM initiative as individual intention to share knowledge with others.

As people are often hostile to knowledge sharing (Agarwal, Poo, & Tan, 2007; Husted & Michailova, 2002), the degree to which one perceives one's organization is ready for change is often dependent on the degree to which one is individually ready for change. Thus, if a faculty member or staff is ready or willing to share one's knowledge and ready to participate in a KM initiative, s/he is more likely to perceive other colleagues to be ready to share their knowledge as well. This would influence one's assessment of the university's collective readiness to adopt KM. Therefore, we hypothesize:

Hypothesis 1: The individual readiness to participate in a KM initiative positively affects one's perception of organizational readiness to adopt KM in the university.

Let us now review the individual factors affecting KM readiness.

Trust (independent variable)

Trust can be viewed as an expression of faith and confidence between few parties during whatever exchange that a person or an institution will be fair, reliable, ethical, competent, and non-threatening and that it will not be exploited by any party (Caldwell & Clapham, 2003). Generalized trust moves to an impersonal form beyond an individual to encompass a social unit as a whole (Putnam, 1993). Kankanhalli *et al.,* (2005) define generalized trust as the belief in the good intent, competence, and reliability of employees with respect to contributing and reusing knowledge. In this study, we operationalize trust as this definition of generalized trust. Kanhanhalli *et al.,* cite generalized trust as a key factor that provides a context for cooperation and effective knowledge exchange, where people may trust each other without much personal knowledge about each other. In many studies, trust has been found to play a facilitating role in inter- and intra-organizational cooperation including knowledge sharing (Sharratt & Usoro, 2003; Liao, 2006). Huemer, Von Krogh, & Roose, (1998) regard the level of trust in the organization as the most important factor determining the willingness to share knowledge. Since knowledge sharing is a form of sharing power with others, it takes trust for individuals to share what they know with their co-workers (Lin, 2007a). Abrams *et al.,* (2002) distinguish between benevolence-based trust (where an individual will not intentionally harm another), and competence-based trust (a belief that another person is knowledgeable about a given subject area). Both kinds of trust are important for knowledge sharing. Thus, for a faculty member to be willing to share one's knowledge, s/he must believe in the good intent, competence and reliability of other faculty members and staff in one's department or school in the university. Thus, trust is a key ingredient for a faculty member's willingness to participate in a KM initiative by sharing what s/he knows with other colleagues. Therefore, we hypothesize:

Hypothesis 2: Trust positively affects the individual readiness to participate in a KM initiative.

Knowledge self-efficacy (independent variable)

Self-efficacy is defined as a person's beliefs and self-judgment about their capabilities to produce desired results i.e. what they can do with the skills they possess (Bandura, 1994). Perceived self-efficacy helps individuals develop those skills that lead to specific behavior patterns (Bandura, 1986). Given people's goals, self-efficacy is one of the most important encouraging predictors of people's performance (Heslin & Klehe, 2006).

In the knowledge-sharing context, it has been seen as one of the main determinants in forming a self-motivational force and an optimistic attitude for employees to share knowledge with colleagues (Bock & Kim, 2002; Wasko & Faraj, 2005; Ye *et al.*, 2006). A construct used to capture this relationship has been knowledge self-efficacy (Lin, 2007b) or knowledge sharing self-efficacy (Hsu *et al.*, 2007). In this study, we operationalize self-efficacy as knowledge self-efficacy i.e. a person's belief and self-judgment about possessing the knowledge and the capability to share with others. If people feel that they lack useful knowledge, they may decline from sharing as they believe that their contribution cannot make a positive impact to the organization (Kankanhalli *et al.*, 2005). A faculty member with high knowledge self-efficacy is, thus, more likely to want to

share knowledge with his/her colleagues, and consequently, be more ready to participate in a KM initiative. Therefore, we hypothesize:

Hypothesis 3: Knowledge self-efficacy positively affects the individual readiness to participate in a KM initiative.

Perceived degree of collegiality (independent variable)

While collegiality has been very important to colleges and universities, the way people understand it has often been amorphous without a single, agreed-upon definition. The American Association of University Professors defines collegiality as collaborative and constructive cooperation (Schimmel, Johnston, & Stasio, 2013). Here, collaboration or the ability to work with each other is a central tenet. Cipriano, (2011) defines collegiality as cooperative interaction among colleagues. Cipriano also adds that as an adjective, collegial means collective responsibility shared by each member of a group of colleagues with minimal supervision from above. He stresses that collegial behavior does not imply mindless conformity or absence of dissent, but rather an enhancement of productive dissent. Gappa, Austin, & Trice, (2007) define collegiality as "the opportunities for faculty members to feel that they belong to a mutually respected community of scholars who value each faculty member's contributions to the institution and feel concern for their colleagues' well-being'' (p. 305). Johnston, Schimmel, & O'Hara, (2012) came up with a 27-item model of collegiality utilizing Organ, (1988)'s organizational citizenship behavior dimensions of altruism, conscientiousness, sportsmanship, courtesy and civic virtue. These dimensions can be construed as collectively defining collegiality. In Johnston *et al.,*(2012)'s study, the items pertaining to courtesy and sportsmanship had the highest reliability. Schimmel, Johnston, & Stasio, (2013) used 23 of the 27 items by Johnston *et al.,*(2012) in their study of two different groups of professors. They found that an item each from courtesy, "negotiates respectfully with co-workers", and from sportsmanship "demonstrates respect towards co-workers" respectively were rated by the two groups as being the most representative of collegiality. Thus, mutual respect can be seen as a central tenet of collegiality. The words 'negotiates' and 'demonstrates' speak to actions, which can tie to other definitions incorporating cooperation and collaboration. Thus, in this study, we operationalize collegiality as 'cooperating and collaborating respectfully with colleagues'.

A faculty member who is willing to cooperate and collaborate respectfully with one's colleagues would be more likely to share one's knowledge with others, and be ready to participate in a KM initiative. Cooperative norms and collaboration have been strongly correlated with knowledge sharing (Jarvenpaa & Staples, 2000). Ingram & Roberts, (2000) found that cooperative norms can help lessen potential conflict and enable knowledge sharing. The very process of collaboration requires communication and sharing of knowledge. Thus, a faculty member who collaborates is likely to be already engaged in knowledge sharing, and be more receptive to participate in a college or department-wide KM initiative. Thus, the collegial nature of a faculty member will affect one's readiness to participate in KM. Therefore, we hypothesize:

Hypothesis 4: Perceived degree of collegiality positively affects the individual readiness to participate in a KM initiative.

Openness for change (independent variable)

Many spiritual traditions e.g. Buddhism emphasize change and impermanence as a constant feature of human life. It is one of the most difficult things for humans to grapple with – the suffering of trying to hold on to things that are always changing. Some people, often with time and practice, are more easily able to accept change compared to others – those with more personal resilience

as compared to others (Wanberg & Banas, 2000). Even for the same person, some changes are easier or more difficult as compared to others. Most managers and leaders are aware that successfully introducing change, of any kind, is difficult where resistance to change is often dramatic and immediate (Holt, Bartczak, Clark & Trent, 2007). Many change efforts fail since they don't pay enough attention to employee's psychological responses to organizational change (Martin, Jones, & Callan, 2005) such as increased feelings of anxiety, negative emotions, uncertainty, and ambiguity among employees (Kiefer, 2005). Implementing KM and knowledge sharing philosophies in organizations often require significant organizational change (Davenport & Prusak, 1998).

Psychologists have identified five broad personality traits: extraversion, neuroticism, openness to experience or intellect, agreeableness, and conscientiousness, often termed as the 'Big Five' or the 'Five-Factor Model' (Matzler & Mueller, 2011; Marouf & Alrukabi, 2015). Of these, openness-to-experience refers to the preference for novel experiences and ideas, engaging in intellectual activities, and enjoying new experiences (Furnham, Dissou, Sloan, & Chamorro, 2007). Matzler & Renzl, (2007) found that openness is often correlated with being curious, cultured, imaginative, intelligent, broad-minded, artistically sensitive, and original.

Wanberg & Banas, (2000) described openness to change as consisting of two facets – a willingness to support change, and a positive affect towards change. In our study, we operationalize openness to change as openness to experience, willingness to support change and a positive emotion towards change. Openness to changes that are being proposed and implemented in an organization is a "necessary, initial condition for successful planned change" (Miller, Johnson, & Grau, 1994, p.60). Marouf & Alrukabi, (2015) investigated the relationship between personality type and knowledge sharing among employees in different companies in the Gulf Cooperation Council. They found that openness correlates strongly with the overall knowledge sharing, and is significantly related to individual attitudes toward knowledge sharing. Fang & Liu, (2002) also found a strong relationship of openness with willingness to share, and with knowledge sharing behavior in a non-profit organization. A number of other studies have found that team members with high openness scores tend to share and disseminate knowledge more often, as compared to those with lower openness scores (Matzler, Renzl, Mooradian, von Krogh, & Mueller, 2011; Gupta, 2008; Wang & Yang, 2007;. Hsu, Wu, & Yeh, 2007; Chang, 2006). Thus, in a university setting, the openness of faculty members to change should have a positive effect on their individual readiness to participate in a KM initiative. Therefore, we hypothesize:

Hypothesis 5: Readiness for change positively affects the individual readiness to participate in a KM initiative.

Reciprocity (independent variable)

Reciprocity is often cited in relation to social exchange theory – the exchange perspective within sociology (Blau, 1964). According to Ekeh (1974), the reciprocity principle refers to the mutual reinforcement by two parties of each other's actions. It all starts when a person in the exchange makes a "move", and if the other reciprocates, new rounds of exchange initiate, until it becomes self-reinforcing (Zafirovski, 2005). If the other doesn't reciprocate, the quality of exchange often suffers (Kachra, 2002). Chiu *et al.,* (2006) defined reciprocity as 'actions that are contingent on rewarding reactions from others and that cease when these expected reactions are not forthcoming' (p.1877). In our study, we operationalize reciprocity as the 'level of anticipated reciprocity' i.e. to what extent does a person sharing knowledge expects to receive in return.

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People would want to share knowledge because they expect future help from others in lieu of their contributions (Kollock, 1999).

"A knowledge seller will spend the time and effort needed to share knowledge effectively if he expects the buyers to be willing sellers when *he* is in the market for their knowledge. This is what Tom Wolfe calls "the favor bank" in *Bonfire of the Vanities*. I may choose to miss my dinner to help my fellow consultant if I believe that the caller has knowledge that *I* may need to elicit in the future. If the caller knows nothing that could possibly be of use to me in the future, I may claim that I have no knowledge to offer and decide to go home instead." (Davenport & Prusak, 1998, p.32). Davenport & Prusak write that with finite time, effort and knowledge, people, in general, won't spend scarce resources unless the expenditure brings meaningful returns. A number of researchers have found that the level of anticipated reciprocity of shared knowledge is a major determinant of people's attitudes and intentions towards knowledge sharing (Bock *et al.*, 2005; Chiu *et al.*, 2006; Lin 2007). Thus, faculty members with a positive experience and expectations of reciprocity are more likely to want to share their knowledge. Therefore, we hypothesize:

Hypothesis 6: Reciprocity positively affects the individual readiness to participate in a KM initiative.

3   Methodology

As the constructs in our research model deal with perceived attributes of a large, geographically-dispersed sample, the survey method was appropriate for our study.

Instrument development

A questionnaire was developed based on the literature surrounding individual constructs in the empirical research model for the study. Operational definitions of the constructs used in this study have been explained and defined in the preceding section.

Most measurement items for the survey instrument were adapted from prior literature. New items were developed when needed. This helped satisfy the content validity of the items. Consistent with previous studies, all items were measured on a five-point Likert scale, where 1 meant strongly disagree and 5 measured strongly agree.

The following demographic information was also included in the questionnaire – size of university, type of university, university location, work role/position, department/discipline/school working in a department, number of years of teaching experience, gender, age and education.

Pre-testing

The initial version of this instrument was pretested for content validity by five faculty members and one researcher who did not participate in the main study. Participants were asked to comment on the format, length, and wording of each individual item. Ambiguous items were reworded based on the participants' feedback. Appendix 1 shows the items with the final wording. The questionnaire and the design of the study was approved by the Institutional Review Board of

Simmons College. Participation was voluntary. Filling out the questionnaire implied consent. For ease of distribution, a web-based version of the instrument was created using Google form. The survey can be accessed at http://goo.gl/forms/n4idD6hTA0. None of the questions were made compulsory. Thus, a participant could choose not to answer a question he or she was uncomfortable with. In order to protect the identity of the faculty members, no names, email addresses or university names were gathered.

Main data collection

The target population of this study is faculty members teaching in universities North America. The study population is all the faculty members in accredited Library and Information Science programs[2] (accredited by the American Library Association - ALA) in 59 universities across North America.

In surveying faculty members, a number of possibilities were considered – 1) sampling universities from a sample of countries across the world; 2) sampling countries from each continent, and a set of universities from the sampled countries; and 3) sampling from the top-ranked universities in each continent/region of the world. In considering these, a big issue was the difference in faculty members based on regions, languages, disciplines, and university reputation. To control for these difference, a single discipline – Library and Information Science (LIS) was chosen. To control for differences in the level and quality of LIS programs across the world, only those programs accredited by ALA were chosen. This also provided a sampling frame with the websites of all accredited programs listed. A census of all faculty members teaching in these programs was carried out. Email addresses of full-time individual faculty members (full/associate/assistant professors; visiting professors were excluded) were obtained from the websites of each program and compiled in a spreadsheet. Personalized individual emails were sent to the faculty inviting them to participate in a web-based survey. In all, 1263 faculty members from 59 universities were contacted between March and April, 2015. During this period, two follow-up reminder emails were also sent to the entire sample, as the survey was anonymous. 158 faculty members filled out the survey, leading to a response rate of 12.51%. While the percentage of response rate is low, it is equivalent to other studies involving faculty, as they are a very busy population involved in teaching, research and service responsibilities. One response was incomplete, leading to a final sample size N=157. The sample size was considered adequate for the purposes of this study.

4 Data Analysis and Results

The survey responses were collected and tested using a structural equation model (SEM). Statistical analysis was conducted on the survey data (N=157) using SPSS and LISREL. After analyzing the demographic data using descriptive statistics, we carried out reliability and validity analysis. This was followed by hypothesis testing and post-hoc analysis.

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[2] http://www.ala.org/accreditedprograms/directory/alphalist

Participants

Majority of the respondents were female professors (around 55%). Majority of the respondents were above the age of 60 (around 34%) while there were almost an equal number of respondents in their 40s and 50s respectively. As expected, most of the respondents hold a Ph.D. degree. The respondents were almost equally distributed amongst the ranks of assistant, associate and full professors in decreasing order. On average, the faculty surveyed had been teaching for around 16 years, though this varied widely, with some teaching for just about a year, and going all the way up to 50 years.

More than 80% of the respondents were from large universities with more than 1000 employees. 13% were from medium-sized universities while the rest were from smaller universities. Most (81.5%) of the universities were government-funded, while 17% were self-financing.

Most of the universities (88%) were in USA, while the rest were in Canada. From the US universities, 20 respondents were from North Carolina, 13 from New York, 12 from Texas, 9 from California and 8 from Massachusetts. The codes used for the mapping of US and Canada state can be found in http://tinyurl.com/uscan-states . Around 39% of the participants worked in institutions labeled LIS, while 18% were from schools.

Reliability and Validity Analysis

The proposed research model (Figure 1) was tested for internal consistency reliability, convergent and discriminant validity. Factor analysis was performed to explain the variation among observed, correlated variables in terms of latent variables i.e. factors or constructs. 7 items (out of 35 for all constructs) were dropped during factor analysis (TRST1, TRST2, KSEF3, KSEF4R, OPN5R, RCP5 and IRD1). Table 1 shows the best linear combination of items that explain each respective construct the most, and other values for the constructs. All reliabilities were found to be greater than 69%, and all extracted variances greater than 66%. All factor means are positive and significant.

The table also shows the composite reliability (CR) and average variance extracted (AVE) values. The classical reliability coefficient Cornbach α is a unidimensional measure of reliability which may lead to inaccurate estimate of reliability if the condition of unidimensionality is not satisfied (Miller, 1995). The measure assumes that all factor loading are equal, and all error variance are also equal (Raycov & Shorout, 2002). The methods under which α is calculated assumes uncorrelated errors of measurements which may or may not be satisfied. It is also true that the measures underestimate or overestimate the reliability of a construct.   Construct reliability as a measure of internal consistency is needed to evaluate the internal consistency more accurately (Fornell & Larckon, 1981). The coefficient α is just a rough estimate of a linear CR (Raycov & Shrout, 2002). On the other hand AVE measures the amount of variability captured by the construct (Bagozzi & Phillips, 1991). Higher CR values of the indices indicate better the convergent reliability of the latent variables. It is recommended that the CR of a construct should be higher than .65 for the construct to be acceptable (Hair *et al.*, 2010). For the convergent validity

to be satisfied, AVE must be greater than .5 (Hair *et al.*, 2010). These are satisfied for all constructs.

Table 1 Reliability and Validity of Constructs

Factors	Items	Extracted Variance	Reliability Coefficient	Convergent Validity			Factor Mean	Factor SD
				Factor Loadings	CR	AVE		
TRST	TRST3	68.66%	76%	.733	.8527	.6593	4.48***	0.592
	TRST4			.702				
	TRST5			.801				
KSEF	KSEF1	66.11%	69.1%	.777	.8227	.6251	4.20***	0.624
	KSEF2			.792				
	KSEF5R			.759				
COL	COL1	85.81%	95.8%	.869	.9732	.9237	3.95***	0.895
	COL2			.888				
	COL3			.887				
	COL4			.906				
	COL5			.890				
OPN	OPN1	65.32%	80.8%	.823	.8811	.7157	4.38***	0.523
	OPN2			.863				
	OPN3			.649				
	OPN4			.695				
RCP	RCP1	79%	91.1%	.782	.9403	.8404	3.90***	0.815
	RCP2			.905				
	RCP3			.888				
	RCP4			.850				
IRD	IRD2	70.01%	85%	.787	.9159	.7841	4.56***	0.509
	IRD3			.667				
	IRD4			.765				
	IRD5			.774				
ORD	ORD1	81.92%	94.5%	.838	.9627	.8962	3.34***	0.872
	ORD2			.819				
	ORD3			.887				
	ORD4			.901				
	ORD5			.911				
OVERALL		85.7%		74.87				

*** Mean is significant at the 0.000 level

Looking at the means of all factors in the research model (Table), the study found that all independent variables were rated quite high (ranging between 3.9 and 4.48 on a scale of 1 to 5). All the means were strongly significant. Ranking from the highest mean to the lowest, the pecking order of independent variables was trust, openness, knowledge self-efficacy, perceived degree of collegiality and reciprocity. While faculty members showed a high individual readiness to

participate in a KM initiative (mean of 4.56), the perception of organizational readiness to participate in a KM initiative was towards the middle on a scale of 1-5 (mean of 3.34).

Upon selecting the most reliable and valid constructs, we used the LISREL software to fit the data to the proposed conceptual research model. All measures of goodness of fit implied that the proposed conceptual model fits the data very well. The Normed Fit Index = 0.90, Non-Normed Fit Index = 0.93, Parsimony Normed Fit Index = 0.78, Comparative Fit Index = 0.94, Incremental Fit Index = 0.94, Relative Fit Index = 0.88, Critical N = 81.82,   Root Mean Square Residual (RMR) = 0.035, Standardized RMR = 0.021, Goodness of Fit Index (GFI) = 0.85, Adjusted GFI = 0.82, and Parsimony GFI = 0.87.

Table shows the association between each pairs of constructs. There were weak positive but significant correlations among most constructs. However, there was strong positive and significant correlations between IRD and OPN ($r = 0.69$, $p \leq 0.001$), between TRST and COL ($r = 0.66$, $p \leq 0.001$), between IRD and KSEF ($r = 0.55$, $p \leq 0.001$) and between KSEF and OPN ($r = 0.54$, $p \leq 0.001$).

For discriminant validity to be satisfied, the items in a construct must be different from those measuring other constructs i.e. load more highly on constructs they are intending to measure than on other constructs (Shanshan, 2014). To measure this, the square root of the average variance extracted (AVE) of each latent variable from its indicators should exceed the construct's correlation with other constructs (Agarwal, Xu, & Poo, 2011). As seen in Table 2, the square root of AVE (diagonal values in bold) values are greater than any correlation among constructs. Since both convergent validity and discriminant validity are satisfied, the construct validity is satisfied for all constructs (Agarwal, 2011).

Table 2 Correlation between constructs and square root of AVE

	ORD	IRD	TRST	KSEF	COL	OPN	RCP
ORD	**.947**						
IRD	0.49***	**.885**					
TRST	0.33***	0.40***	**.811**				
KSEF	0.24***	0.55***	0.33***	**.791**			
COL	0.40***	0.29***	0.66***	0.09	**.961**		
OPN	0.22***	0.69***	0.22**	0.54***	0.05	**.846**	
RCP	0.24**	0.41***	0.40***	0.25***	0.32***	0.27***	**.917**

Correlation is significant at the ***0.001 level, **0.01 level, and *0.05 level (1-tailed).

Hypothesis testing

Table 3 and Figure show the results of the hypothesis testing using path analysis. As seen, all hypotheses of the research model are supported except for Hypothesis 2 that investigates the relationship between trust and individual readiness to participate in a KM initiative. Hypothesis 1 (relationship between individual readiness and organizational readiness to participate in a KM initiative) and Hypothesis 5 (relationship between openness to change and individual readiness) were very strongly significant ($p < 0.001$). Hypothesis 3 (relationship between knowledge self-efficacy and individual readiness) and Hypothesis 6 (relationship between reciprocity and individual readiness) were strongly significant ($p < 0.01$) while Hypothesis 4 (relationship between perceived degree of collegiality and individual readiness) was supported at the $p < 0.05$ level.

Table 3 Results of Hypothesis testing using Path Analysis

Hyp.	Paths	Path-Coefficient	Standard Error	T-value	P-value	Level of support
H1	IRD→ORD	0.42***	0.11	3.76	0.000	Very strongly supported
H2	TRST→IRD	0.07	0.11	0.66	0.255	Not supported
H3	KSEF→IRD	0.21**	0.08	2.44	0.008	Strongly supported
H4	COL→IRD	0.176*	0.09	1.74	0.042	Supported
H5	OPN→IRD	0.41***	0.08	5.06	0.000	Very strongly supported
H6	RCP→IRD	0.19**	0.07	2.64	0.005	Strongly supported

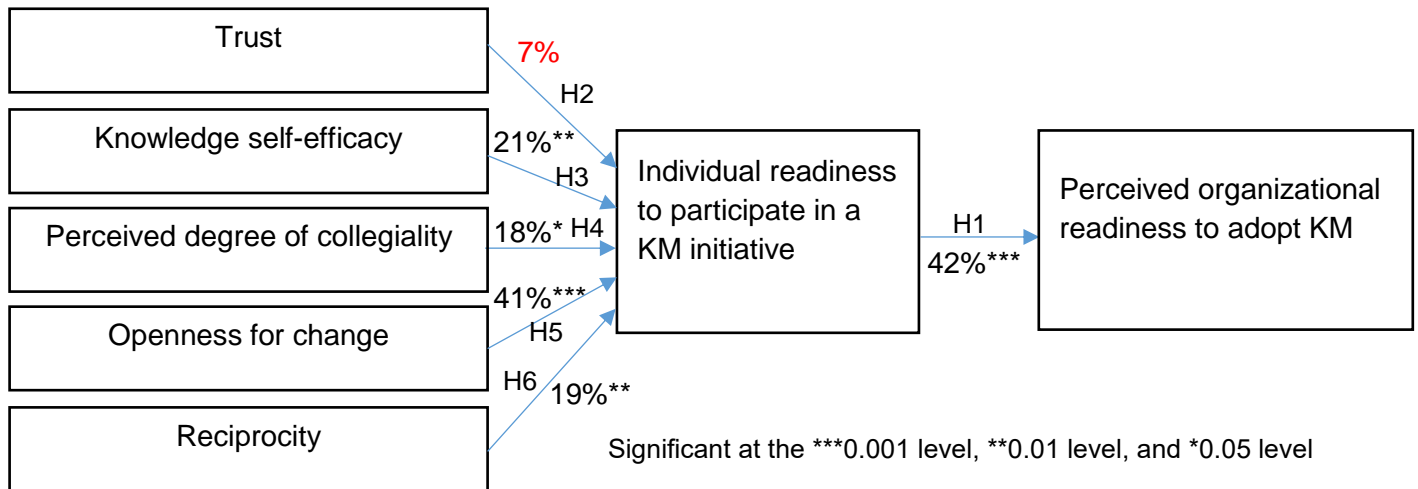Significant at the ***0.001 level, **0.01 level, and *0.05 level.

Figure 2 Results of Hypothesis testing (path-coefficient and significance)

Post-hoc analysis

We also investigated the direct, indirect and total effects between all independent variables with the mediator IRD and with the dependent variable ORD.

Direct Effect. As seen in Table , the significant relationships are highlighted in bold. The direct effect between degree of collegiality (COL) and perceived organizational readiness to adopt KM (ORD) was found to be significant ($p < 0.05$), while the effects from the other independent variables to ORD were not significant.

Indirect effect. There were three significant indirect effects – from knowledge self-efficacy (KSEF), openness to change (OPN) and reciprocity (RCP) to ORD. The ones were KSEF (9%) and RCP (8%) were weakly positive but significant, while the indirect effect from OPN to ORD was both positive (17%) and strongly significant ($p < 0.001$).

Total effect. Between the independent variables and the mediator, the total effects from KSEF (21%, $p < 0.001$), COL (17%, $p < 0.05$), OPN (41%, $p < 0.001$) and RCP (19%, $p < 0.01$) to IRD

were found to be all positive and significant. Between the independent variables and the dependent variable, the total effects from COL (32%, $p < 0.01$) and OPN (17%, $p < 0.05$) to ORD were both positive and significant. The total effect from IRD to ORD was positive and strongly significant (42%, $p < 0.001$).

Table 4 Path Analysis

Paths	Path-Coefficient	Standard Error	T-value	P-value
DIRECT EFFECT				
TRST→ORD	-0.002	0.12	-0.20	0.421
KSEF→ORD	0.00	0.10	0.03	0.488
COL→ORD	0.25	0.11	2.30*	0.011
OPN→ORD	0.00	0.10	-0.03	0.488
RCP→ORD	-0.12	0.08	-1.37	0.086
INDIRECT EFFECT				
TRST→ORD	0.03	0.05	0.65	0.258
KSEF→ORD	0.09	0.04	2.06*	0.021
COL→ORD	0.07	0.04	1.61	0.055
OPN→ORD	0.17	0.06	3.05***	0.001
RCP→ORD	0.08	0.04	2.16*	0.016
TOTAL EFFECT				
TRST→IRD	0.07	0.11	0.66	0.255
TRST→ORD	0.00	0.13	0.04	0.484
KSEF→IRD	0.21	0.08	2.44**	0.008
KSEF→ORD	0.09	0.10	0.91	0.182
COL→IRD	0.17	0.09	1.76*	0.040
COL→ORD	0.32	0.11	2.83**	0.003
OPN→IRD	0.41	0.08	5.06***	0.000
OPN→ORD	0.17	0.09	1.86*	0.032
RCP→IRD	0.19	0.07	2.64**	0.005
RCP→ORD	-0.04	0.09	-0.41	0.341
IRD→ORD	0.42	0.11	3.76***	0.000

Significant at the ***0.001 level, **0.01 level, and *0.05 level.
Significant relationships are highlighted in **bold**.

5 Discussion

It is not surprising that the independent variables apart from trust (openness to change and knowledge self-efficacy) were rated higher than the variables that were associated with the relationship with colleagues (degree of collegiality and reciprocity) (Table 1). This is because while one can be more confident of self-perceptions, it is difficult to be sure of the perceptions of one's colleagues. Also, faculty members' perceptions about individual readiness to participate in a university KM initiative was significantly higher than their perceptions about their university's readiness to adopt KM. This may be because a lot of organizational variables such as (top management support, relationship between faculty and administration, human resource practices, financial considerations and priorities of the university, etc.) would come into the equation for

organizational readiness. As compared to individual readiness, a faculty member participating in the survey would find little control over those variables and their impact on organizational readiness.

According to the empirical confirmative test result of the SEM model (shown in Table and Figure), the faculty in this study exhibit a positive intention to share their knowledge and accordingly, perceive positively their university's readiness to adopt KM. The study found that all the independent variables except for trust had significant effects on a faculty member's individual readiness to participate in a KM initiative. Of these, the strongest effect on individual readiness was that of openness to change.

Openness to change. We had operationalized openness to change as preference for novel experiences and ideas, engaging in intellectual activities, and enjoying new experiences, a willingness to support change, and a positive emotion towards change. As Miller, Johnson, & Grau, (1994) found, openness to change is a "necessary, initial condition for successful planned change" (p.60). Marouf & Alkurabi, (2015) a strong correlation between openness and individual attitude toward knowledge sharing. Our finding is consistent with these and other studies (e.g. Matzler, Renzl, Mooradian, von Krogh, & Mueller, 2011; Gupta, 2008; Fang & Liu, 2002). Thus, the faculty members that are most open to change are the most ready to participate in a university KM initiative. This implies that for any university KM initiative, the participants first chosen for a pilot must be a group of enthusiastic and open faculty members, who can help show early positive results, that can then enable scaling up of KM in the rest of the organization. This was also suggested by Agarwal & Marouf, (2014).

Knowledge self-efficacy. Faculty members are mostly hired on the basis of their expertise in certain areas. This expertise is developed over the course of the Ph.D. process in a certain field and developed further through one's career as a faculty member. Thus, it is natural for faculty members to have high self-perceptions of knowledge self-efficacy as found in this study. This leads to confidence in one's capability to possess the knowledge worthy of sharing with others. The positive relationship between knowledge self-efficacy and individual readiness to participate in a KM initiative is consistent with the findings in prior studies (Kalman, 1999; Bock & Kim, 2002; Wasko & Faraj, 2005; Ye *et al.*, 2006; Lin, 2007b).

Perceived degree of collegiality was found to positively affect individual readiness. Faculty members need to feel that they belong to a mutually respected community of scholars who value each faculty member's contributions to the institution and feel concern for their colleagues' well-being (Gappa, Austin, & Trice, 2007). This need fuels cooperative norms and collaboration (Gappa, Austin, & Trice, 2007), which requires knowledge sharing. In prior studies, cooperative norms and collaboration have been strongly correlated with knowledge sharing (Jarvenpaa & Staples, 2000; Ingram & Roberts, 2000).

Reciprocity. Reciprocity is the human need to begin expecting as soon as we do something or perceive we have done something for others. Organ & Konovsky (1989) argue that when two individuals are influenced by their social and organizational contexts, especially where

unspecified cooperative outputs such as knowledge are exchanged, the social exchange relationship is a major determinant of their attitudes. This knowledge exchange is evident in the work of faculty in areas of teaching, research and committee work. This explains the positive relationship found between reciprocity and individual readiness. By sharing their knowledge, faculty may hope to receive reciprocal benefits which can facilitate their work in these different areas. This is consistent with prior studies (Amayah, 2013; Chiu *et al.*, 2006; Wasko & Faraj, 2000).

Trust. Although trust was shown to be effective in terms of its influence on intention to share knowledge (individual readiness) in other contexts (Abrams *et al.*, 2002; Sharratt & Usoro, 2003; Liao, 2006), results of the study did not support this hypothesis in a university context. We had operationalized trust as the belief in the good intent, competence, and reliability of employees with respect to contributing and reusing knowledge. This was based on the definition of generalized trust (Kankanhalli *et al.*, 2005). Abrams *et al.,* (2002) distinguish between benevolence-based trust (where an individual will not intentionally harm another), and competence-based trust (a belief that another person is knowledgeable about a given subject area). Our survey items touched upon the ability of employees to reuse knowledge in a fair and appropriate manner (closer to benevolence-based trust). Competence-based trust might have been more relevant in a university context, as it applies to individual readiness to participate in a KM initiative.

The study also found a positive relationship between individual readiness to participate in a KM initiative and organizational readiness to adopt KM. Implementing KM projects or knowledge-sharing philosophies in a university would require significant organizational change. The degree to which one perceives one's university is ready for change is often dependent on the degree to which one is individually ready for change. Although organizational change is often about change in structures, hierarchy or technology, it is mediated through individual change. Many change efforts can fail since they underestimate the importance of the individual, cognitive-affective nature of organizational change (Devos & Buelens, 2003). Thus, consistent with the linkage of intention to behavior (Fishbein & Ajzen,1975), the study confirms that intention to share knowledge (individual readiness) have a positive influence on the organizational readiness to adopt KM.

Limitations and Future research

It is important to note the limitations of this survey study. First, the study was limited to faculty members in North American LIS schools (those accredited by the ALA). The surveyed faculty members showed a high mean value for openness to change (4.38 on a scale of 1 to 5). Harzing & Hofstede, (1996) proposed that national cultures of high individualism, low power distance and low uncertainty avoidance facilitate adaptation to change. Morris *et al.,* (1998) found that managers from the USA, rated as a country with a strong individualist culture, rated openness to change higher than managers from China, India and the Philippines, which are countries with collectivist cultures. Thus, it is uncertain if faculty members from countries outside North America and collectivistic cultures would exhibit different degrees of openness to change. Future research should focus on cross-country and cross-national culture comparison of faculty members'

perceptions on the research variables. Second, while the sample size was quite high, the response rate was a modest 12%. The data collection was limited to faculty members who accepted to participate in the study. Therefore, any attempt to generalize the results to all faculty members even in North America should be done with caution. Third, the study used a benevolence-based definition of trust, which was found not to affect individual readiness. Future studies should look at the relationship between competence-based trust and individual readiness to participate in a KM initiative. Fourth, the items for some of the factors were dropped during factor analysis. Even before data collection, the construct validity of items could have been further improved by adopting a two-step sorting procedure described by Agarwal, (2011). Fifth, there is an inherent bias associated in the survey method of data collection. Mixed methods including qualitative data could be utilized in future research. Finally, our survey instrument and the study focused on individual factors only. A more complete readiness instrument should include individual as well as other organizational factors such as culture, structure, process, etc.

6 Implications and conclusions

The results have implications for both research and for practitioners. For research, this study has contributed with the development of a new research model that was tested empirically in the context of universities. A survey instrument was designed and tested to address Step 3 in Agarwal & Marouf, (2014)'s 10-step process, focusing on KM readiness. Thus, while Agarwal & Marouf, (2014) recommended what was to be done in Step 3 of the KM initiation process in a university-context, this study demonstrated how to actually go about doing that. For practitioners, the study indicates the importance of being aware that introducing changes of any kind (KM initiative as an example) is difficult where resistance to change is often dramatic and immediate. Because of this, university leaders and administration have been encouraged to proactively prepare their universities as they begin any change initiative. As the first step in this preparation, leaders should comprehensively examine faculty members' underlying readiness to embrace such a proposed change in the form of a KM initiative. The study found a strong connection between individual readiness and organizational readiness. Thus, the university administration should pay special attention to the individual factors of openness, knowledge self-efficacy, collegiality and reciprocity which were found to have a strong impact on individual readiness. When implementing KM across the university, the unit or department with the highest scores across all these variables and for overall individual and organizational readiness should be chosen as the pilot site to ensure early successes. The success story could be marketed and the implementation then scaled to other schools or departments of the university.

In conclusion, a university should always have a readiness assessment going on before embarking on an actual KM initiative. This will help to discover the enablers and the barriers that are critical for success. Readiness in universities, would occur when faculty members' intentions are such that they are receptive to a forthcoming KM effort. For this reason, this study established and tested a theoretical research model and instrument that assessed the individual factors affecting individual readiness and ultimately the success of university readiness.

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Appendix 1

Items for constructs

Construct	Code	Item	Reference
Trust	TRST1*	I believe colleagues in my college/university are knowledgeable and competent in their area.	Adapted from Lee & Choi (2003)
	TRST2*	I believe colleagues in my college/university share the best knowledge that they have.	Adapted from Kankanhalli *et al.* (2005); Mishra (1996)
	TRST3	I believe colleagues in my college/university give credit for other's knowledge where it is due.	
	TRST4	I believe colleagues in my college/university cite the source of the knowledge they receive appropriately.	Self-developed based on Kankanhalli *et al.* (2005); Mishra (1996)
	TRST5	I believe in the good intent of colleagues in my college/university with respect to reusing knowledge.	
Knowledge self-efficacy	KSEF1	I am confident in my ability to provide knowledge that others in my college/university consider valuable.	Adapted from Lin (2007); Kankanhalli *et al.* (2005); Kalman (1999)
	KSEF2	I have the expertise required to provide valuable knowledge for my colleagues in the college/university.	
	KSEF3*	I have the capability to share with colleagues in my college/university what I know.	Self-developed
	KSEF4R*	It does not really make any difference whether I share my knowledge with colleagues or not.	Adapted from Lin (2007); Kankanhalli *et al.* (2005); Kalman (1999)
	KSEF5R	Most colleagues in my college/university can provide more valuable knowledge than I can.	
Perceived degree of collegiality	COL1	The colleagues in my college/university demonstrate respect towards each other.	Adapted from Johnston, Schimmel, & O'Hara (2012)
	COL2	The colleagues in my college/university support each other.	
	COL3	The colleagues in my college/university negotiate respectfully with each other.	
	COL4	The colleagues in my college/university cooperate respectfully with each other.	Self-developed
	COL5	The colleagues in my college/university collaborate respectfully with each other.	
Openness for change	OPN1	I am open to novel experiences and ideas.	Self-developed
	OPN2	I enjoy new experiences.	
	OPN3	I am willing to support change in my college/university.	

	OPN4	I am enthusiastic when changes are proposed in my college/university.	Developed based on Holt et al. (2007)
	OPN5R*	I am upset when changes are proposed in my college/university.	
Reciprocity	RCP1	When I provide an answer to a colleague's question in my college/university, I believe somebody will provide an answer to a question I might have.	Developed based on Kankanhalli *et al.* (2005)
	RCP2	When I share knowledge with colleagues in my college/university, I expect them to respond when I'm in need.	Adapted from Kankanhalli *et al.* (2005)
	RCP3	When I contribute my knowledge to colleagues in my college/university, I expect to get back knowledge when I need it.	
	RCP4	When I share knowledge with colleagues in my college/university, I believe that my queries for knowledge will be answered in future.	
	RCP5*	I believe colleagues in my college/university treat others reciprocally.	Adapted from Lee & Choi, 2003
Individual readiness to participate in a KM initiative	IRD1*	I will share my knowledge with more colleagues in my college/university.	Adapted from Bock *et al.* (2005)
	IRD2	I will always provide my knowledge at the request of colleagues in my college/university.	
	IRD3	I intend to share my knowledge with colleagues in my college/university frequently in the future.	
	IRD4	I will try to share my knowledge with colleagues in my college/university in an effective way.	
	IRD5	I will share my knowledge to anyone in my college/university if it is helpful to the college/university.	
Perceived organizational readiness to adopt KM	ORD1	I believe that my college/university is prepared for effective KM.	Self-developed
	ORD2	I believe that my college/university is ready to adopt KM.	
	ORD3	I believe that my college/university will adopt KM in the near future.	Adapted from Islam, Agarwal, & Ikeda (2014); Agarwal, Wang, Xu, & Poo (2007)
	ORD4	I believe that my college/university will adopt KM in the longer term.	
	ORD5	I believe that my college/university will adopt KM.	

* Dropped during factor analysis