PKM TOOLS FOR ACADEMIA: INGREDIENTS FOR SUCCESS IN THE GLOBAL KNOWLEDGE SOCIETY

Ammar H. Safar, Ph.D.
Department of Curriculum and Teaching Methods, College of Education, Kuwait University, The State of Kuwait
dr.ammar@ku.edu.kw

Fahad A. Alkhezzi, Ph.D.
Department of Curriculum and Teaching Methods, College of Education, Kuwait University, The State of Kuwait
dr.alkhezzi@ku.edu.kw

ABSTRACT
This study aimed to assess the reaction-based satisfaction level of Kuwait University's students regarding the utilization of some PKM tools in their academic studies and its influence on managing their knowledge. A total of 100 undergraduate students from the College of Education participated in this research. Regardless of students being not aware at all about KM, PKM, and PKM tools. Yet, the fact is that the results showed a significantly positive, affirmative, and encouraging feelings, attitudes, and perceptions with respect to using PKM tools for academia and personal life as well (i.e., yielded an agreement ratio about 95 percent). The majority of the participants did consider PKM tools as being appropriate and useful to their work/study. They also did believe that PKM tools are important constituents for success in the global knowledge society. Thus, most of the participants were highly satisfied with PKM tools and, accordingly, their reaction-based satisfaction level was positive and significantly high among all subgroups.
Keywords: Knowledge Management, Personal Knowledge Management, Knowledge Management Tools, Personal Knowledge Management Tools, Education

INTRODUCTION

Knowledge, innovations, and advancements in information and communication technologies (ICT) have always played a remarkable role in the development and transformation of society we live in throughout history, from agrarian to industrial and now to a knowledge driven society which entails the acquisition, usage, and sharing of knowledge, skills, attitudes, competencies, proficiencies, practices, and experiences (Al-Hawamdeh, 2004). The wave of innovations and advances in ICT is affecting and touching all sectors of life such as engineering, science, technology, entertainment, economic, political, social, education, health, and cultural (Rooney, Hearn, & Kastelle, 2012; Rooney, Hearn, & Ninan, 2008).

ICT tools will continue to change the nature of knowledge capture, creation, storing, classification, publication, and sharing. Organizations (e.g., corporations, enterprises, institutions, research laboratories, and other entities as well as individuals) that tend to disregard and/or diminish the significant role of ICT tools in the conduct of knowledge management (KM) may possibly lose the opportunity of success in this global knowledge society where the true competence for a knowledge worker is the capability to be able to stay connected and belong to virtual online communities where knowledge is and can be constantly disseminated and shared (Jennex, 2007; Rikowski, 2007; Handzic & Zhou, 2005).

Personal knowledge management (PKM) is the core of KM. Individuals (i.e., knowledge workers) may utilize processes, methods, strategies, practices, and tools in order to capture, develop, save, organize, disseminate, communicate, collaborate, and share their knowledge (i.e., their PKMs) with other individuals within a contextual framework (i.e., an organization). However, for KM to be fully implemented, other KM enablers within an organization also play a remarkable role in the completion of any KM initiative. Since KM is a socio-technological phenomenon, therefore, the other KM enablers include: (1) the organizational environment such as the organizational culture, the organizational structure, leadership, measurement, as well as incentives and rewards; and (2) the technological infrastructure which includes a wide range of ICT tools for organizational as well as personal uses (Handzic & Zhou, 2005).

Individuals are ever more in need to be responsible for their own growth and learning. They need information, skills, competencies, processes, methods, strategies, practices, and tools by which they can use to assess what they know in a given circumstances and then look further for means to fill out the gaps in their knowledge. Although an individual can be excellent practitioner at KM without using specialized ICT tools. However, these processes, strategies, and methods often entail the use of information and communication technologies (Jennex, 2007; Rikowski, 2007; Handzic & Zhou, 2005).

Therefore, introducing and utilizing PKM tools and enablers effectively and efficiently in PK-12 schools and higher education institutions as well as in organizations and entities worldwide seems to be relevant in order to achieve success and to help keep their knowledge workers' (i.e., students/learners, employees, and individuals) skills and competencies abreast.

OBJECTIVES OF THE STUDY

The use of PKM tools has a significant influence on organizations' success, effectiveness, and efficiency. The impact of these tools is touching the organizations' infrastructures as well as their personnel. The State of Kuwait, since the beginning of the twenty-first century, is among these nations embracing and nourishing the integration of ICT in Kuwait's public and private sectors. With the upcoming deployment of ICT initiatives in PK-12 schools and higher education institutions, including Kuwait University (KU), across the State of Kuwait, the need for tools and ideas on using and integrating the technology effectively and efficiently is paramount. Therefore, introducing and utilizing PKM tools in Kuwait's educational system is a necessity if we need to prepare the knowledge workers successfully for living in this global knowledge society.

This study aimed to examine/assess the reaction of KU's students regarding the utilization of some PKM tools in their academic studies and its influence on managing their knowledge. Students' feelings, perceptions, and attitudes were measured in order to achieve this objective. To that end the following questions were tackled:

1. Are KU's students aware about KM, PKM, and PKM tools?
2. Do KU's students use any type of PKM tools?
3. Do KU's students believe that PKM tools are useful ingredients for success in the global knowledge society?
4. Are KU's students satisfied with PKM tools?
5. How KU's students feel about their experience with PKM tools?

ASSUMPTIONS AND LIMITATIONS OF THE STUDY

The study assumed that KU's students reaction-based satisfaction level was highly positive regarding the utilization of PKM tools in their academic studies. Thus, the research foresaw that the students' feelings, perceptions, motivations, and attitudes toward PKM tools would prominently be positive, affirmative, and encouraging. The study covered the use of PKM tools in academic activities of the students enrolled only in a course entitled 'Computing in Education 0840-235'. Other areas of applications were excluded. A sample of 100 female senior undergraduate students in the College of Education (COE) at KU were scrutinized and surveyed for this research due to the nature of the academic course of study that limits the number of students enrolled in each section to 20-25 students in senior classes.

SIGNIFICANCE OF THE STUDY

Although many research studies undertaken over the past two decades have examined and clearly defined the efficiencies and effectiveness of ICT tools/programs, in general, and PKM tools/initiatives, in particular, on organizations' efficacy, productivity, financial capital, intellectual capital/asset, and success. However, through the course of searching, retrieving, and reviewing literature for this study, the researchers found no evidence of such studies—focusing essentially on the impact of PKM tools—in the Arab Gulf Cooperation Council (AGCC).

And, since the State of Kuwait is undertaking a widespread national reform plan in order to become an internationally renowned financial and economic center in the region. As a result, the Government is embracing, endorsing, and sustaining many initiatives toward achieving such vision in numerous organizations in the country covering both the public and private sectors. One such initiative entails the integration of ICT in Kuwaiti organizations in order to thrive the path in becoming a successful e-government practitioner as well as preparing e-citizens whom are ready to live in the global knowledge society.

Therefore, introducing the knowledge workers of Kuwait with KM and PKM literacy is a necessity to its future. Specifically, these knowledge workers need to be familiar with PKM tools, processes, methods, strategies, and

practices. This study introduced KU's students with such required literacy and it also provided them with the opportunity to use and integrate some PKM tools in their academic studies and personal lives as well.

This research provided valuable contribution regarding the reaction-based satisfaction level of KU's students with respect to PKM tools usefulness, effectiveness, and efficiencies. The results of this study delineated if there is sufficient demand for introducing and using PKM tools for academic studies at KU, specifically, and other higher education institutions, generally, as well as in Kuwait's PK-12 education. The findings provided a profile and reference for policy and decision makers as well as professionals regarding the integration of PKM tools in Kuwait's organizations. Hence, the research presented, somewhat, the top-management rank executives with empirical evidences that either support or contest the application and integration of PKM tools on a national level in Kuwait's organizations.

LITERATURE REVIEW

The following literature tackles the definition of PKM tools and its impact on organizations' success. It also includes pertinent information that covers typology of relevant ICT tools for managing individual's knowledge.

Grundspenkis (2007) and Wright (2005) simply defined PKM tools as a collection of processes, strategies, methods, activities, practices, services, and technologies that an individual carries out, with the objective to identify, create, gather, classify, organize, store, search, retrieve, and share knowledge in his/her daily activities and how these processes support work activities. In addition, Higgison (2004) elaborated further on this definition of PKM tools to assert that PKM technologies revolve around a set of core issues: (1) Managing and supporting personal and/or organizational knowledge and information so that it is accessible, meaningful, and valuable to the individual and/or organization; (2) Maintaining networks, contacts, and communities; (3) Making life easier and more enjoyable; and (4) Exploiting personal and/or organizational capital.

Scholarly research studies over the past two decades have undoubtedly proven that the usage and integration of KM/PKM tools, processes, methods, practices, and strategies into organizations' have played a positively significant and meaningful role on organizations' effectiveness, efficacy/efficiency, productivity, innovation, intellectual asset, financial capital, organizational learning, competitiveness, and success (Land, Land, & Handzic, 2002). Stated differently, KM/PKM tools enhanced decision making; improved collaboration and communication; increased profits and market share/size as well as share price; augmented employees' skills; reduced costs; enriched productivity and creativity; inspired critical and analytical thinking; increased innovation; heightened learning/adaptation capability; improved business processes; elicited new or better ways of working; stimulated entry to different market type or created additional business opportunities; enabled better product or service quality; escalated employees' empowerment; facilitated sharing best practices; provoked return on investment (ROI) of KM efforts; boosted intellectual capital (IC); fostered the formation of more value to customers; empowered better staff attraction/retention; allowed quicker response to key business issues; facilitated better customer handling; and improved new products development lines (Dalkir, 2011; Jennex, 2007; Kok, 2007; Maier, 2004; Ofek & Sarvary, 2001; Elliott & O'Dell, 1999; Van Buren, 1999; Wiig, 1999; Ruggles, 1998; Allee, 1997).

Typologies of KM/PKM technologies can help better understand the potential significant roles that ICT tools may have/play in KM/PKM. There are several classifications of ICT tools for KM/PKM. However, Handzic and Zhou (2005) presented a comprehensive typology of relevant ICT tools for KM/PKM that combined from the work of Alavi and Leidner (2001), Grover and Davenport (2001), and Davis (1998). This typology is based on the characteristics of KM processes as well as their usage purposes. In this typology, ICT tools that support KM/PKM can easily be classified into one of seven categories.

The first category in this typology is 'knowledge storage' technologies. These tools are used in order to capture and store organizational knowledge to improve organizational memory as well as to supply widespread access to knowledge resources. Examples include: knowledge repositories, databases, data marts, and data warehouses.

The typology's second category is 'knowledge access' technologies that can be employed in the knowledge storage process of KM too, but with the purpose of enhancing access to knowledge saved in 'knowledge storage' tools and/or supporting the transformation of knowledge amongst individuals. Some examples are: knowledge maps, knowledge directories, and electronic yellow pages.

'knowledge search/retrieval' technologies is the third category in this typology. It includes ICT tools used in the knowledge search/retrieval process of KM, with the intention of locating internal knowledge on the

intranets/extranets and/or external knowledge on the Internet as well as enhancing access to knowledge resources by escalating the rapidity and accuracy of knowledge search/retrieval. Search engines, both PC-based and Web-based, and intelligent agents are obvious examples.

The fourth is 'knowledge delivery/sharing' technologies. These are ICT tools that can be adopted in the knowledge transfer process of KM to disseminate knowledge to places where it is needed and can be exploited. Some examples are: e-mail systems, voice mail systems, instant messaging systems, electronic bulletin board systems, whiteboards, videoconferencing, online discussions groups/forums, groupware, and social networking services tools/technologies such as social networking sites, social bookmarking sites, blogs, vlogs, klogs, content sharing sites, rss/feed aggregators, and wikis.

The typology's fifth component is 'knowledge discovery and visualization' technologies. The ICT tools included in this category can be utilized in the knowledge creation process of KM to explore, examine, and analyze raw data in order to identify, recognize, and discover hidden patterns and relationships as well as to extract new knowledge. Examples include: data and text mining tools, statistical tools, personal thinking/visualization tools (e.g., concept/mind maps), simulations, and desktop productivity tools (e.g., word processors, spreadsheets, presentations, databases, HTML editors, graphics editors, desktop publishing tools, digital video/audio production tools, multimedia authoring technologies, animation tools, and e-mail clients).

The sixth category in this typology is 'knowledge utilization' technologies, a category that can be deployed in the knowledge application process of KM. These tools have the ability to implant knowledge into work processes, with the objective of assisting and easing knowledge integration and application. KM systems, expert systems, workflow systems, decision support systems, decision trees, and rule inductions are some examples.

The typology's seventh category is 'platform' technologies. The ICT tools that best fit this category are Net-based. These tools can be utilized conjointly with other technologies in any KM process in order to supply a network-based platform for knowledge collection, communication, and analysis. The tools can be applied to facilitate and support all KM processes and for multiple purposes. Entities and organizations around the globe frequently use these networked technologies in order to develop and create a single point of access to multiple sources of knowledge. Examples of such commonly used networked tools are: Internet, intranets, extranets, and portals.

The seven types of KM/PKM technologies presented are not commonly exclusive of each other; however, they are inclusive in nature. Each category is interconnected and interrelated with one another. Some ICT tools may be utilized to sustain several KM processes and as a result it may have multiple objectives. Also, KM/PKM tools are frequently joined/merged in order to construct/generate a mutual effect. Additionally, there may possibly be circumstances in which a technological tool does not fit efficiently into this typology/framework of KM/PKM technologies/tools.

Other dimensions are involved in describing KM/PKM technologies. For example, Rollet (2003) provides a typology/classification of KM/PKM tools according to the following structure: (1) communication; (2) collaboration; (3) content creation; (4) content management; (5) adaptation; (6) e-learning; (7) personal tools; (8) artificial intelligence; and (9) networking. These categories can also be sorted based on the specific phase of the KM cycle in which they are used (i.e., knowledge generation, knowledge codification, and knowledge transfer) (Ruggles, 1997).

It should be noted that KM/PKM technologies consist of either software, or hardware, or a combination of both. KM/PKM systems are either PC-based or network-based, and often, the network-based KM/PKM tools are Web 2.0 technologies that allow users to generate content easily and efficiently (i.e., Web syndication technologies). Some of the KM/PKM tools are free of charge while others are fee-based.

Conclusively, KM tools, in general, and PKM tools, in particular, have the capability to enrich teaching, learning, and training outcomes in the academia as well as to empower individuals' knowledge including their information, capabilities, skills, proficiencies, and experiences. The application of PKM tools within organizations (e.g., academia such as PK-12 schools, colleges, universities, and institutions) have the ability to build a solid foundation for promoting a profound lifelong learning for learners of all ages and across all fields and disciplines. Consequently, PKM tools would assist in preparing knowledge workers (i.e., students, employees, and people) and providing them with the twenty-first century knowledge and skills which would

help nations, globally, to easily transform into knowledge-based communities and seamlessly join and thrive the global knowledge society.

METHODOLOGY

Research design

A descriptive scanning research model was used in this study. Indeed, the first level (i.e., reaction) of Kirkpatrick's classic 4-level evaluation research model was utilized to measure and validate the reaction-based satisfaction level of students/learners utilizing and integrating PKM tools into education for the purpose of managing their own knowledge. This research design is a reference evaluation model. It facilitates assessment at four gradual levels: reaction, learning, transfer, and results. In 1996, Phillips included ROI as a fifth level (Kirkpatrick, 2006). Kirkpatrick's/Phillips' evaluation model assists scholars, academics, administrators, professionals, and policy makers to probe into survey data through a powerful lens close to the participants' experience, thus, providing better clarification and understanding of the reaction-based satisfaction level of the learners'/students' regarding the utilization and integration of PKM tools at KU.

The researchers incorporated the utilization of PKM tools into the instructional framework of an undergraduate two-hundred-level academic course designed for senior students enrolled only in the College of Education at KU. The end-of-course Likert scale surveys were used in this study as the core measurement indicator for the students' reaction level. Responses included strongly agree (5), agree (4), undetermined (3), disagree (2), and strongly disagree (1).

The questionnaire structured around 19 statements stated positively. The statements dealt with perceptions, feelings, beliefs, and attitudes regarding the use of PKM tools. The survey also encompassed a section on the participants' demographic information such as name, university grade level, major, grade point average (GPA), and type of ICT user.

The instrument was constructed after reviewing earlier studies. While developing the data collection instrument, a great deal of consideration was placed into the adequacy of the survey's items that measure the reaction-based satisfaction level as well as the relevancy of the independent/factor variables. The survey was then submitted to a panel of experts for review and pilot tested on selected students who were not part of the research sample. Other forms of measurement such as informal interviews and observations were also incorporated into the investigation to help verifying the satisfaction level of the participants.

Sample

KU provides rich ICT resources for students, faculty, and employees. It supports the integration of ICT into the organization in all areas including disciplinary, administration, and financial. KU is fulfilling its commitment to the national developmental plan for reforming the country toward becoming an active knowledge-based society.

A sample of 100 female senior undergraduate students from the COE at KU enrolled in four sections of an undergraduate-level course entitled 'Computing in Education 0840-235' for the Fall semester of 2011-2012 academic year were asked by the researchers to participate in this study. The sample represented various ethnic and academic backgrounds.

The academic course is a mandatory requirement for the professional preparation of all pre-service teachers in the COE. The course is a three-credit class taught the same subject content by the same instructor, Dr. Ammar Safar, using the same delivery method for instruction. The instructional model used combined face-to-face instruction with online curriculum distributed over the Web using a learning management system provided by KU.

Data collection

The researchers introduced KM and PKM to the participants at the beginning of the Fall semester of 2011-2012 academic year. Then, the instructor presented some of the classifications for categorizing KM/PKM technologies. Later on, the instructor elaborated in his presentation to include detailed information about PKM tools and its role in the global knowledge society, in general, and in the academic world, in particular. Several PKM tools were introduced to the participants during the course period, which was almost four-month in total typically, encompassing all the categories specified in the PKM tools typologies. Hence, the researchers set out the tone for facilitating PKM tools in the academia and then served as guides and mentors. The researchers embraced both roles and noticed participants' positive response to prompt and encouraging feedback.

At the end of the semester, the participants were asked to complete the end-of-course survey. They were demanded to respond to the questionnaire's statements truthfully and honestly based on their experience. They were guaranteed that their responses are highly confidential and will, only, be used for statistical analysis purposes. The data collection was exclusively conducted and administered by the researchers throughout the deployment period of the research.

In addition to the quantitative method (i.e., survey questionnaire) used for collecting the study's data. However, other qualitative modes of inquiry (i.e., informal interviews and observations) were also deployed in this process to insure the quality of the study's data analysis and to supply rich data sources which could serve several functions within the research. Responses to the interviews' questions and the observations' notifications were all recoded into a quantifiable format for data analysis objectives.

Methods of analysis

Several means of analysis were applied to examine the collected data. The descriptive analysis methods used were frequency, percentage, mean, and standard deviation. The inferential statistics techniques used were one-way analysis of variance (ANOVA), Dunnett's C multiple comparisons test, Scheffe's multiple comparisons test, and independent-samples t-test. These methods met the basic parametric assumptions required for their application. When performing inferential tests, an alpha level (significance level) of 0.05 was selected.

In order to measure and assess the students' feelings, perceptions, and attitudes as groups. Several comparisons among the research's questions and other relevant demographic independent/factor variables (e.g., section, GPA, type of ICT user, and major) were conducted. Precisely, a series of ANOVAs were deployed to test for differences between more than two groups. When statistically significant differences were discovered, post hoc techniques such as Dunnett's C and Scheffe's tests were implemented to verify which groups differed. Additionally, a series of t-tests were also utilized to investigate for differences between two groups. The comparisons elucidated how different learners felt toward the utilization of PKM tools for managing their knowledge—whether or not there were any demographic differences among the research groups. The findings of such tests can help policy and decision makers as well as administrative and instructional technology leaders and professionals delineate appropriate solutions to educational challenges.

The collected data were interpreted on the basis of objectives formulated. Each research question is presented, analyzed, and discussed separately and sequentially. The findings are presented in tables. Each table is labeled to indicate the type of data being analyzed.

Data analysis

Research question no. 1: Awareness

This question tackled the awareness of KU's students regarding KM, PKM, and PKM tools. Three items in the survey addressed RQ-1. All students strongly disagreed with these items. Thus, the results showed that all participants (M = 1.0000, and SD = 0.00000) were not aware about KM, PKM, and PKM tools. Inferential tests were not applied for RQ-1 because all responses were in the range of 'Strongly Disagree'—i.e., RQ-1 is a constant variable.

Research question no. 2: Utilization

This question was concerned whether or not KU's students utilize PKM tools for managing their knowledge. One item in the survey addressed RQ-2. Participants either strongly disagreed (i.e., 83.0 percent) or disagreed (i.e., 17.0 percent) with this item. Hence, the findings indicated that all participants (M = 1.1700, and SD = 0.37753) did not use any form of PKM tools for managing their knowledge. The results of the comparisons tests revealed no significant differences among the subgroups.

Table 1: Frequencies, percentages, means, and standard deviations of participants' responses to RQ-1, "awareness", and RQ-2, "utilization".

RQs		Statements	SD		D		U		A		SA		*M*	*SD*
			N	%	*N*	%	*N*	%	*N*	%	*N*	%		
RQ-1	01	I was aware about KM.	100	100.0	0	0.0	0	0.0	0	0.0	0	0.0	1.00	0.000
	02	I was aware about PKM.	100	100.0	0	0.0	0	0.0	0	0.0	0	0.0	1.00	0.000

	03	I was aware about PKM tools.	100	100.0	0	0.0	0	0.0	0	0.0	0	0.0	1.00	0.000
RQ-2	01	I used to utilize PKM tools for managing my knowledge.	83	83.0	17	17.0	0	0.0	0	0.0	0	0.0	1.17	0.378

Research question no. 3: Usefulness

This question focused on whether or not KU's students believe that PKM tools are pertinent and useful ingredients for success in the global knowledge society. Twelve items in the questionnaire represented RQ-3. The results revealed that the majority of the students (i.e., 95.0 percent, *M* = 4.7150, and *SD* = 0.66204) conceded that PKM tools are useful and valuable to them for academia, the job/work, as well as their personal lives. Accordingly, KU's students regarded PKM tools as being relevant and useful elements for thrive and success in the global knowledge society. The findings of the inferential tests disclosed no significant differences among the subgroups with respect to 'Section'. Nevertheless, participants' responses to RQ-3 showed significant differences among all subgroups with respect to 'Type of ICT User', 'GPA', and 'Major'. Those students categorized as 'Professional' ICT users (*M* = 4.9844, and *SD* = 0.05370), having 'Above Average' GPAs (*M* = 4.9621, and *SD* = 0.07820), and majoring in 'Sciences' (*M* = 4.8857, and *SD* = 0.12473) scored significantly greater mean values with respect to RQ-3 than the other subgroups.

Table 2: Frequencies, percentages, means, and standard deviations of participants' responses to RQ-3, "usefulness".

Statements		**SD**		**D**		**U**		**A**		**SA**		***M***	***SD***
		N	**%**	***N***	**%**	***N***	**%**	***N***	**%**	***N***	**%**		
01	I consider PKM tools as being relevant to my study/work.	0	0.0	5	5.0	0	0.0	15	15.0	80	80.0	4.70	0.718
02	I believe that PKM tools provide learners with the 21st century knowledge, skills, and competencies.	0	0.0	5	5.0	0	0.0	13	13.0	82	82.0	4.72	0.712
03	I believe that PKM tools are useful instructional tools across all subject areas and grade levels.	0	0.0	5	5.0	0	0.0	18	18.0	77	77.0	4.67	0.726
04	I believe that PKM tools aid students' learning and help increasing students' achievement.	1	1.0	4	4.0	0	0.0	12	12.0	83	83.0	4.72	0.753
05	I believe that PKM tools help generating and enriching motivation, attitude, engagement, productivity, creativity, and innovation.	0	0.0	5	5.0	0	0.0	19	19.0	76	76.0	4.66	0.728
06	I believe that PKM tools assist learners in managing their knowledge.	0	0.0	5	5.0	0	0.0	13	13.0	82	82.0	4.72	0.712

07	I believe that PKM tools enhance critical/analytical thinking and visual learning capabilities.	0	0.0	5	5.0	0	0.0	20	20.0	75	75.0	4.65	0.730
08	I believe that PKM tools augment communication, collaboration, sharing, and presentation skills.	0	0.0	5	5.0	0	0.0	11	11.0	84	84.0	4.74	0.705
09	I believe that PKM tools are able to identify, create, gather, classify, organize, store, search, retrieve, and share knowledge.	0	0.0	5	5.0	0	0.0	13	13.0	82	82.0	4.72	0.712
10	I believe that PKM tools can increase the empowerment of learners.	0	0.0	5	5.0	0	0.0	10	10.0	85	85.0	4.75	0.702
11	I believe that PKM tools promote e-citizens and/or knowledge workers.	0	0.0	5	5.0	0	0.0	10	10.0	85	85.0	4.75	0.702
12	I believe that PKM tools construct a solid foundation for meaningful lifelong learning.	0	0.0	5	5.0	0	0.0	7	7.0	88	88.0	4.78	0.690

Research question no. 4: Satisfaction

This question concentrated on whether or not KU's students are satisfied with PKM tools. Three items in the survey emphasized on RQ-4. The findings evidently illustrated that most participants (i.e., 95 percent, *M* = 4.8100, and *SD* = 0.67212) acknowledged that they are satisfied with PKM tools. Specifically, the majority of the students stated clearly that they are willing to use PKM tools for managing their knowledge and they will highly encourage other personnel to use PKM tools for the same purpose. Also, most participants asserted that they are gratified because they became acquainted about PKM tools. The results of the comparisons tests unveiled no significant differences among the subgroups with respect to 'Section'. But, participants' responses to RQ-4 displayed significant differences among all participants with regard to 'Type of ICT User', 'GPA', and 'Major'. The mean values for those classified as 'Professional' (*M* = 5.0000, and *SD* = 0.00000) and 'Acquainted' (*M* = 4.9899, and *SD* = 0.05803) ICT users were significantly higher than 'Novice' (*M* = 4.4667, and *SD* = 1.06089) ICT users. Also, the means of the responses for the participants who have been categorized as having 'Above Average' (*M* = 5.0000, and *SD* = 0.00000) and 'Average' (*M* = 4.9810, and *SD* = 0.07850) GPAs were significantly greater than those having 'Below Average' (*M* = 4.4271, and *SD* = 1.10143) GPAs. Additionally, the mean of the responses for the participants who have been majored in 'Sciences' (*M* = 4.9905, and *SD* = 0.05634) was significantly higher than those majored in 'Arts' (*M* = 4.7128, and *SD* = 0.81836).

Table 3: Frequencies, percentages, means, and standard deviations of participants' responses to RQ-4, "satisfaction".

Statements		SD		D		U		A		SA		*M*	*SD*
		N	%	*N*	%	*N*	%	*N*	%	*N*	%		
01	I will use PKM tools for managing my knowledge.	0	0.0	5	5.0	0	0.0	3	3.0	92	92.0	4.82	0.672
02	I will encourage other personnel to use PKM tools for managing their knowledge.	0	0.0	5	5.0	0	0.0	5	5.0	90	90.0	4.80	0.682
03	I am gratified that I became familiar about PKM tools.	0	0.0	5	5.0	0	0.0	4	4.0	91	91.0	4.81	0.677

Research question no. 5: Reaction

This question was related to the reaction-based satisfaction level of KU's students with regard to PKM tools usefulness, effectiveness, and efficiencies for academia. The question illustrated how KU's students feel about their experience with PKM tools. Fifteen items of the end-of-course survey focused on RQ-5 (i.e., RQ-3 consists of 12 items and RQ-4 comprises of three items). The results showed that the reaction-based satisfaction level for overwhelming number of students (i.e., 95 percent, M = 4.7340, SD = 0.66238) was significantly high with respect to their experience with PKM tools. Accordingly, the findings of this research delineated that there is sufficient demand for introducing and using PKM tools for academic studies at KU, specifically, and other higher education institutions, generally, as well as in Kuwait's PK-12 education. The findings of the inferential tests showed no significant differences among the subgroups with respect to 'Section'. Nonetheless, participants' responses to RQ-5 revealed significant differences among all participants with respect to 'Type of ICT User', 'GPA', and 'Major'. Those students categorized as 'Professional' ICT users (M = 4.9875, and SD = 0.04296), having 'Above Average' GPAs (M = 4.9697, and SD = 0.06256), and majoring in 'Sciences' (M = 4.9067, and SD = 0.10504) scored significantly greater mean values with respect to RQ-5 than the other subgroups.

Table 4.1: Analysis of variance of participants' responses to the research questions for type of ICT user differences.

		Sum of Squares	*df*	Mean Square	*F*	Sig.	Partial Eta Squared ηp2
RQ-2: Utilization	Between Groups	.383	2	.192	1.354	.263	
	Within Groups	13.727	97	.142			.027
	Total	14.110	99				
RQ-3: Usefulness	Between Groups	8.189	2	4.094	11.282	.000	
	Within Groups	35.203	97	.363			.189
	Total	43.391	99				
RQ-4: Satisfaction	Between Groups	6.349	2	3.174	8.024	.001	
	Within Groups	38.374	97	.396			.142
	Total	44.723	99				
RQ-5: Reaction	Between Groups	7.773	2	3.887	10.571	.000	
	Within Groups	35.662	97	.368			.179
	Total	43.436	99				

Table 4.2: Post hoc multiple comparisons tests for type of ICT user differences.

Dependent Variable		(I) Type of ICT User	(J) Type of ICT User	Mean Difference (I-J)	Std. Error	Sig.
RQ-2: Utilization	Dunnett's C	1 Novice	2 Acquainted	-.12641	.08676	
			3 Professional	-.13304	.08842	
		2 Acquainted	1 Novice	.12641	.08676	
			3 Professional	-.00663	.10361	
		3 Professional	1 Novice	.13304	.08842	
			2 Acquainted	.00663	.10361	
RQ-3: Usefulness	Dunnett's C	1 Novice	2 Acquainted	-.53016*	.17196	
			3 Professional	-.65342*	.17062	
		2 Acquainted	1 Novice	.53016*	.17196	
			3 Professional	-.12326*	.02526	
		3 Professional	1 Novice	.65342*	.17062	
			2 Acquainted	.12326*	.02526	
RQ-4: Satisfaction	Dunnett's C	1 Novice	2 Acquainted	-.52323*	.17961	
			3 Professional	-.53333*	.17932	
		2 Acquainted	1 Novice	.52323*	.17961	
			3 Professional	-.01010	.01010	
		3 Professional	1 Novice	.53333*	.17932	
			2 Acquainted	.01010	.01010	
RQ-5: Reaction	Dunnett's C	1 Novice	2 Acquainted	-.52877*	.17310	
			3 Professional	-.62940*	.17211	
		2 Acquainted	1 Novice	.52877*	.17310	
			3 Professional	-.10063*	.02139	
		3 Professional	1 Novice	.62940*	.17211	
			2 Acquainted	.10063*	.02139	

*. The mean difference is significant at the 0.05 level.

Table 5.1: Analysis of variance of participants' responses to the research questions for GPA differences.

		Sum of Squares	*df*	Mean Square	*F*	Sig.	Partial Eta Squared ηp2
RQ-2: Utilization	Between Groups	.359	2	.180	1.267	.286	
	Within Groups	13.751	97	.142			.025
	Total	14.110	99				
RQ-3: Usefulness	Between Groups	8.677	2	4.339	12.123	.000	
	Within Groups	34.714	97	.358			.200
	Total	43.391	99				
RQ-4: Satisfaction	Between Groups	6.906	2	3.453	8.857	.000	
	Within Groups	37.817	97	.390			.154
	Total	44.723	99				
RQ-5: Reaction	Between Groups	8.295	2	4.148	11.449	.000	
	Within Groups	35.140	97	.362			.191

		Sum of Squares	*df*	Mean Square	*F*	Sig.	Partial Eta Squared ηp2
RQ-2: Utilization	Between Groups	.359	2	.180	1.267	.286	
	Within Groups	13.751	97	.142			.025
	Total	14.110	99				
RQ-3: Usefulness	Between Groups	8.677	2	4.339	12.123	.000	
	Within Groups	34.714	97	.358			.200
	Total	43.391	99				
RQ-4: Satisfaction	Between Groups	6.906	2	3.453	8.857	.000	
	Within Groups	37.817	97	.390			.154
	Total	44.723	99				
RQ-5: Reaction	Between Groups	8.295	2	4.148	11.449	.000	
	Within Groups	35.140	97	.362			.191
	Total	43.436	99				

Table 5.2: Post hoc multiple comparisons tests for GPA differences.

Dependent Variable		(I) GPA	(J) GPA	Mean Difference (I-J)	Std. Error	Sig.
RQ-2: Utilization	Dunnett's C	1 Below Average	2 Average	-.07768	.08318	
			3 Above Average	-.14867	.09209	
		2 Average	1 Below Average	.07768	.08318	
			3 Above Average	-.07100	.09958	
		3 Above Average	1 Below Average	.14867	.09209	
			2 Average	.07100	.09958	
RQ-3: Usefulness	Dunnett's C	1 Below Average	2 Average	-.58237*	.18619	
			3 Above Average	-.67306*	.18495	
		2 Average	1 Below Average	.58237*	.18619	
			3 Above Average	-.09069*	.02883	
		3 Above Average	1 Below Average	.67306*	.18495	
			2 Average	.09069*	.02883	
RQ-4: Satisfaction	Dunnett's C	1 Below Average	2 Average	-.55387*	.19516	
			3 Above Average	-.57292*	.19471	
		2 Average	1 Below Average	.55387*	.19516	
			3 Above Average	-.01905	.01327	
		3 Above Average	1 Below Average	.57292*	.19471	
			2 Average	.01905	.01327	
RQ-5: Reaction	Dunnett's C	1 Below Average	2 Average	-.57667*	.18762	
			3 Above Average	-.65303*	.18663	
		2 Average	1 Below Average	.57667*	.18762	
			3 Above Average	-.07636*	.02461	
		3 Above Average	1 Below Average	.65303*	.18663	
			2 Average	.07636*	.02461	

*. The mean difference is significant at the 0.05 level.

Table 6: Independent samples t-test of participants' responses to the research questions for major differences.

		Levene's Test for Equality of Variances		t-test for Equality of Means			Partial Eta Squared
		F	Sig.	*t*	*df*	Sig. (2-tailed)	ηp2
RQ-2: Utilization	Equal variances assumed	13.458	.000	1.653	98	.102	
	Equal variances not assumed			1.844	92.223	.068	.027
RQ-3: Usefulness	Equal variances assumed	11.752	.001	-1.918	98	.058	
	Equal variances not assumed			-2.579	69.598	.012	.036
RQ-4: Satisfaction	Equal variances assumed	17.651	.000	-2.000	98	.048	
	Equal variances not assumed			-2.723	65.122	.008	.039
RQ-5: Reaction	Equal variances assumed	12.866	.001	-1.939	98	.055	
	Equal variances not assumed			-2.620	67.985	.011	.037

DISCUSSION

This study exhibited empirical evidences on the reaction-based satisfaction level of KU's students concerning the utilization of some PKM tools in their academic studies and its influence on managing their knowledge. Regardless of students being not aware at all about KM, PKM, and PKM tools. Yet, the fact is that the results showed a significantly positive, affirmative, and encouraging attitudes and perceptions with respect to using PKM tools for academia and personal life as well (i.e., yielded an agreement ratio about 95 percent). The majority of the participants did consider PKM tools as being appropriate and useful to their work/study. They also did believe that PKM tools are important constituents for success in the global knowledge society. Thus, most of KU's students were highly satisfied with PKM tools and, accordingly, their reaction-based satisfaction level was positive and significantly high among all subgroups. These findings are consistent with the literature reviews provided in this paper as well as the assumptions postulated.

Furthermore, despite the fact that the results showed no significant differences among the subgroups with regard to 'Section'. However, the findings also revealed that there are significant differences among all constituencies with respect to 'Type of ICT User', 'GPA', and 'Major'. Those students categorized as 'Professional' ICT users, having 'Above Average' GPAs, and majoring in 'Sciences' scored significantly greater mean values with respect to RQ-3 (i.e., Usefulness), RQ-4 (i.e., Satisfaction), and RQ-5 (i.e., Reaction) than the other subgroups. These findings are also cohesive/consistent with many research studies conducted over the past decade.

The qualitative data—collected from the interviews' questions and the observations' notes—were very helpful in portraying a rich depiction of students' experiences with PKM tools. For example, the findings revealed that the majority of the students affirmed that they know how to use and integrate basic ICT tools such as word processing (i.e., Microsoft *Word*), presentations (i.e., Microsoft *PowerPoint*), collaboration (i.e., Web-based e-mail systems such as *Yahoo! Mail* and *Gmail*), and drill-and-practice applications. Yet, the students also affirmed that they are not familiar with using and integrating more advanced ICT tools. These include the

followings: electronic collaboration suites, simulations, animation tools, problem-solving applications, tutorial applications, spreadsheets, databases, multimedia, digital video/audio production tools, graphics editors, desktop publishing tools, concept/mind mapping and visual thinking/learning applications, and Web 2.0 technologies (e.g., wikis, blogs, vlogs, webinars, podcasts, discussion groups, forums, instant messaging, rss/feed aggregators, video streaming, online desktop productivity tools sites, content sharing sites, social bookmarking sites, and other forms of social networking media tools). Thus, these results also coincide with many research studies conducted in the past four years (Lei, 2009; Brush, Glazewski, & Hew, 2008).

Additional empirical evaluation studies are projected to be deployed on a wide scope of students from various KU's colleges. These research studies would be conducted using additional data collection tools and techniques in order to address the limitations of this study, which focused on the perceptions and attitudes of a small sample of participants.

CONCLUSIONS AND RECOMMENDATIONS

We need to prepare all learners to become knowledge workers who comprehend how today's ICT tools can help solve tomorrow's challenges. The revolutionary alterations and advances in ICT expanded our ability to resolve obstacles at a scale never before anticipated—using strategies, techniques, and methods that have not been available to us beforehand. Learners will need to take full advantage of these revolutionary alterations carried out by rapid advances in ICT. Learners will need to learn, understand, and practice new information, skills, and proficiencies. Learners will also need to utilize PKM technologies in order to be able to manage their knowledge. Understanding PKM tools and utilizing them efficiently and effectively is crucial to all learners as we work hard to: (1) nurture the level of academic achievement; (2) facilitate learners with the twenty-first century skills and information; (3) motivate and prepare learners for universal competitiveness; (4) mingle academics with real life; and (5) prepare learners for thrive and success in the global knowledge society. PKM tools can work prolifically across all disciplines and with all ages.

There is no doubt that ICT tools play a remarkable role in facilitating PKM. Some of the benefits of using PKM tools would be enhancing personal as well as organizational productivity, efficiency, creativity, innovation, critical thinking, visual learning, time management, task management, motivation, financial capital, intellectual asset, and success (Dalkir, 2011; Jennex, 2007; Kok, 2007; Maier, 2004; Land et al., 2002). PKM technologies can generate vigorous learning experiences. They have the ability to identify, create, gather/collect, classify, organize, store, search, retrieve, deliver/disseminate, and share knowledge in ways that benefit all types and ages of learners as well as encompassing a wide range of backgrounds and skill/competence levels (Bonk & Zhang, 2008). However, individuals ought to know and realize which PKM tools to use?; for what purposes?; how to efficiently and effectively use them?; when to use them?; where we can use them?; and who can use them? Once knowledge workers find answers for such relevant questions related to PKM tools, then, they will be able to achieve PKM's ultimate objectives in less time and efforts.

Additionally, the possibilities that PKM tools hold are endless because of the revolutionary and continuous advances and innovations in ICT. Yet, there is not a perfect PKM tool that can serve all my needs and achieve all of my goals. Each PKM technology has its own facets and it can be used in specific circumstances by particular individuals to achieve certain objectives. Therefore, knowledge workers are eagerly encouraged to utilize several PKM tools to sustain their needs and ultimately achieve their goals.

If the State of Kuwait, generally, and KU, specifically, are eager to be part of the global knowledge society and attain their desired educational and economic advantages, then, we should seek the following recommendations:

1. A well-planned and defined media awareness campaign focusing on KM/PKM and its related tools is a necessity on a large scale.
2. Attention to other KM enablers should also be accounted for when using PKM tools in Kuwaiti organizations such as the organizational environment which includes the following: (1) organizational culture; (2) organizational structure; (3) leadership; (4) measurement; (5) policy; and (6) incentive/reward systems.
3. There are specific skills and competencies associated with PKM that we need to be certain that our knowledge workers acquire and be acquainted with. Examples are: reflection, managing learning, managing knowledge, visual thinking, visual learning, individual learning, analytical thinking, information literacy, organization, categorization, researching, librarianship, searching and retrieving, assessment, communication, collaboration, presentation, creativity, innovation, productivity, problem solving, social networking, and security (Verma, 2009; Dorsey, 2001).

4. Providing KU's community members with training sessions on how to efficiently and effectively integrate PKM tools within the curricula/organization.
5. Higher education institutions should focus on KM/PKM and its relationship with IC so as to be one of the courses added to the general requirement curricula in the academia.
6. A great sense of security should be embraced by all members of the organization when using free PKM tools.
7. Each organization is highly encouraged to develop its own PKM tools because the IC of the organization needs to be secured and preserved.
8. Taking the following dimensions into consideration when assessing any PKM tool: instructional support, usability, interactivity, compatibility, and ROI.
9. More solid experimental and longitudinal studies are needed to be implemented in order to produce concrete measures of KM/PKM tools effectiveness and efficiencies on knowledge workers and organizations alike.

Finally, knowledge is something which only humans can possess. It is an asset and power. If you are a knowledgeable individual, then, you have status and you are in demand. ICT is not the core problematic issue when deploying a KM initiative/solution in any entity in the State of Kuwait since there is an adequate support available, from the Government, as far as ICT is concerned. The real issue is that we should focus on individuals' attitudes, because, in essence, individuals are the real gears that lead to a successful KM integration in any organization. Thus, addressing the issue of PKM and its related technologies in an organization is considered to be the most important KM enabler. Knowledge workers need to be aware that PKM tools are important for their personal productivity and also for their contributions toward organizational effectiveness. They need to be encouraged to start experimenting with whatever PKM tools are available to them. Additionally, measuring the effectiveness and efficiencies of KM/PKM tools in organizations' is vital, yet, a challenging issue since it requires to take into consideration both the users' and organizations' satisfaction. Hence, we certainly need to pay closer attention to these variables so as to succeed and thrive in our e-journey toward becoming a successful and interactive partner in the global knowledge society.

REFERENCES

Alavi, M., & Leidner, D. E. (2001). Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Quarterly*, 25(1), 107-136.

Al-Hawamdeh, S. (2004). *Knowledge management: Cultivating knowledge professionals*. Oxford, UK: Chandos Publishing.

Allee, V. (1997). *The knowledge evolution: Expanding organizational intelligence*. Waltham, MA: Butterworth-Heinemann.

Bonk, C. J., & Zhang, K. (2008). *Empowering online learning: 100+ activities for reading, reflecting, displaying, and doing*. San Francisco, CA: Jossey-Bass.

Brush, T., Glazewski, K. D., & Hew, K. F. (2008). Development of an instrument to measure preservice teachers' technology skills, technology beliefs, and technology barriers. *Computers in the Schools*, 25(1-2), 112-125.

Dalkir, K. (2011). *Knowledge management in theory and practice* (2nd ed.). Cambridge, MA: The MIT Press.

Davis, M. C. (1998). Knowledge management: Information strategy. *The Executive's Journal*, 15(1), 11-22.

Dorsey, P. A. (2001). *Personal knowledge management: Educational framework for global business*. Decatur, IL: Tabor School of Business, Millikin University.

Elliott, S., & O'Dell, C. (1999). Sharing knowledge and best practices: The hows and whys of tapping your organization's hidden reservoirs of knowledge. *Health Forum Journal*, 42(3), 34-37.

Grover, V., & Davenport, T. H. (2001). General perspectives on knowledge management: Fostering a research agenda. *Journal of Management Information System*, 18(1), 5-21.

Grundspenkis, J. (2007). Agent based approach for organization and personal knowledge modeling: Knowledge management perspective. *Journal of Intelligent Manufacturing*, 18(4), 451-457.

Handzic, M., & Zhou, A. Z. (2005). *Knowledge management: An integrative approach*. Oxford, UK: Chandos Publishing.

Higgison, S. (2004). Your say: Personal knowledge management. *Inside Knowledge*, 7(7). Retrieved June 18, 2014, from http://www.ikmagazine.com/xq/asp/sid.0/articleid.DDDD6EE3-47C6-49CD-9070-F1B1547FD29F/eTitle.Your_say_Personal_knowledge_management/qx/display.htm

Jennex, M. E. (2007). *Knowledge management in modern organizations*. Hershey, PA: IGI Global.

Kirkpatrick, D. L. (2006). *Evaluating training programs: The four levels* (3rd ed.). San Francisco, CA: Berrett-Koehler Publishers.

Kok, A. (2007). Intellectual capital management as part of knowledge management initiatives at institutions of higher learning. *Electronic Journal of Knowledge Management*, 5(2), 181-192.

Land, L. P. W., Land, M., & Handzic, M. (2002). Retaining organizational knowledge: A case study of an Australian construction company. *Journal of Information and Knowledge Management*, 1(2), 119-129.

Lei, J. (2009). Digital natives as preservice teachers: What technology preparation is needed? *Journal of Computing in Teacher Education*, 25(3), 87-97.

Maier, R. (2004). *Knowledge management systems: Information and communication technologies for knowledge management*. New York, NY: Springer Publishing.

Ofek, E., & Sarvary, M. (2001). Leveraging the customer base: Creating competitive advantage through knowledge management. *Management Science INFORMS*, 47(11), 1441-1456.

Rikowski, R. (2007). *Knowledge management: Social, cultural, and theoretical perspectives*. Oxford, UK: Chandos Publishing.

Rollet, H. (2003). *Knowledge management processes and technologies*. New York, NY: Springer Publishing.

Rooney, D., Hearn, G., & Kastelle, T. (Eds.). (2012). *Handbook on the knowledge economy* (2nd ed.). Northampton, MA: Edward Elgar Publishing.

Rooney, D., Hearn, G., & Ninan, A. (Eds.). (2008). *Handbook on the knowledge economy*. Northampton, MA: Edward Elgar Publishing.

Ruggles, R. (1998). The state of notion: Knowledge management in practice. *California Management Review*, 40(3), 80-89.

Ruggles, R. (1997). *Knowledge tools: Using technology to manage knowledge better*. Waltham, MA: Butterworth-Heinemann.

Van Buren, M. (1999). A yardstick for knowledge management. *Training Development, Alexandria*, 53(5), 71-77.

Verma, S. (2009). *Personal knowledge management: A tool to expand knowledge about human cognitive capabilities*. Retrieved June 18, 2014, from http://www.ijetch.org/papers/81New.pdf

Wiig, K. M. (1999). What future knowledge management users may expect. *Journal of Knowledge Management*, 3(2), 155-166.

Wright, K. (2005). Personal knowledge management: Supporting individual knowledge worker performance. *Knowledge Management Research and Practice*, 3(1), 156-165.