A Theoretical Model to Integrate PKM with Kolb's Learning Model for Mitigating Risks From Exhaustive Internet Exposures

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Abstract: Recent studies on use of Internet among youngsters suggest problematic behaviour and adverse impacts on overall health as there are uncharted boundaries of information and media through Internet. Such related problems include Internet addiction, shyness, alienation, psychological distress and academic performance decrement over time. As a consequence, the ability of students in tertiary education to communicate effectively and interact humanly could deteriorate as they become more accustomed to networking via Internet. However, students nowadays do increasingly rely on the Internet to perform research under the knowledge-based economy despite concerns over reliability and truthfulness of information available from Internet. Against such a background, we construct a framework for an optimal use of Internet with the main purpose of Personal Knowledge Management (PKM). We argue for an interventionist approach to orient students in tertiary education to develop a strategic mindset that utilizes Internet as a source for developing knowledge about learning outcomes while mitigating the risks associated with over-reliance and inadequate uses. There are specific skills of PKM for an optimal use of Internet. These skills can be learned in the initiation of a study programme and reinforced in course delivery, which include course assessments and assignments provided. Students are advised on the validated sources, such as electronic databases and e-libraries that are well-recognized as knowledge bases for studying and learning. PKM aims to orient students in tertiary education to develop a strategic mindset that exploits Internet as a source for developing knowledge about learning outcomes while mitigating the risks associated with over-reliance and inadequate uses. The importance of orientation, on-going monitoring and reinforcing position habits through pedagogies should be emphasized. A key potential benefit of this approach is to prevent students from adopting habits of using Internet that could cause health-related problems and develop into behaviours that inhibit their future developments.

Keywords: internet addiction, personal knowledge management, knowledge-based economy, tertiary education

1. Introduction and background of this study

Internet use is becoming widespread worldwide, especially in developed cities. High speed information flow is making knowledge available to a much wider community, associated with very high educational value and attainment. Hence knowledge and information are no longer the savvy for the elites in modern day societies (Bergmark, Bergmark & Findahl, 2011).

Hong Kong is among the top ten cities with the highest household internet coverage, because of the economic affordability, the geographic advantage of being small and densely populated, and more importantly the social and cultural factors, leading to a phenomenal penetration of the technology. There is the convenience of all time access in nearly all parts of this city, and this is further supported by free "WiFi" connection in community facilities such as shopping malls. Internet users also enjoy anonymity, social networking, no geographic boundaries, and free information (Lau et al., 2008; Shek, Tang & Lo, 2009).

The widespread adoption of internet has resulted in some new phenomena, being an integral, indispensable and inescapable part of daily life. Many studies, both local and overseas, have revealed inappropriate use, especially among young people. Numerous terms have been suggested, including Internet addiction, Internet addiction disorder, addictive Internet use, Internet dependence, compulsive use, compulsive Internet use, problematic Internet use, pathological Internet use, and unregulated Internet usage, cyber addiction, etc. Nonetheless, it is a topic full of controversy (Kim et al., 2010; Lau, 2011; Özdemir, Kuzucu & Ak, 2014; Spada et al., 2014; Sun et al., 2012).

Internet addiction (IA), the more widely adopted term, encompasses the following characteristics (Yang et al., 2013):

- an uncontrollable use;
- the use being markedly distressing, time-consuming or resulting in social, occupational, or financial difficulties; and
- negatively affecting academic performance, family relationships, and mood status.

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On the other hand, a number of treatments and interventions have been suggested and tried. Professor Young of Pennsylvania, United States of America, who has been a pioneer researcher in Internet addiction in the last two decades, has proposed cognitive behavioural therapy, CBT-IA, for treating Internet addiction (Young, 2007, 2011). These studies have shown that rationalization has led to a reduction in compulsive use. Young has also suggested that other treatment modalities such as psychodynamic therapies, gestalt, group counseling, or in vivo counseling within an online community should be explored in future research to determine their therapeutic impact and efficacy (Young, 2007 & 2011).

This study has adopted an interdisciplinary approach to the problem of IA and aims to construct a framework for an optimal use of Internet with the main purpose of Personal Knowledge Management. We argue for an interventionist approach to orient students in tertiary education to develop a strategic mindset that utilizes Internet as a tool to develop knowledge for learning outcomes while reducing the risks associated with over-reliance and inadequate uses.

2. Interdisciplinary review

2.1 Increasing concerns over misuse of Internet and health among the youngsters

Eating, sexuality, spending, and exercising are essential activities, but can be addictive and damaging to our daily functioning when uncontrolled or misused. Our generation depends very heavily on the Internet for learning, social activities as well as for leisure. Overdependence on Internet and the excessive use cause damage and trouble in our daily life. Young people are more susceptible to IA because they are less self-regulative and more susceptible to media influences. Therefore, we should strike a good balance among leisure, social, academic, and workplace internet use, both online and offline, for betterment of an overall well-being. (FU et al., 2010; Lau, 2011; Lee & Loke, 2005; Leung & Lee, 2012; Ma, 2011).

We have increasing concerns over Internet misuse among the youngsters. IA is a serious youth development issue, which must be addressed by concerned professionals and policy makers. Many studies have examined the risks and negative influence on higher education students across the continents. Internet use is a basic skill in academia, but has a great potential for pathological use, like gambling, among university students. The prevalence rate of IA ranges from 5.0 to 18.4%, more among male, senior grades, and poor academic performers. Moreover, dissatisfaction with university life and low levels of social support are also contributing factors (Alavi et al., 2012; Kim et al., 2010; Kim et al., 2013; Lau et al., 2008; Lau, 2011; Law, 2006; Özdemir, Kuzucu & Ak, 2014; Randler, Horzum & Vollmer, 2014; Shek & Yu, 2012; Sun et al., 2012; Tavolacci et al., 2013; Thomas & Martin, 2010; Tokunaga, 2014; Xu et al., 2012).

The health considerations related to the misuse of the Internet are far reaching. Eye and neck discomforts are the most referred bodily complaints arising from prolonged internet and computer use. Daytime sleepiness, sleep disturbance, anxiety and depression are commonly found in IA. As with other addictive disorders, IA is associated with impaired social, peer and family relationship, low academic performance, and some psychological problems, including low self-esteem, shyness, loneliness, social anxiety, stress, depressive symptoms, obsessive behaviours and suicidality, although IA has not been found to be directly linked with substance abuse. It has been noted that comorbid psychopathology is likely to exacerbate the presentation of IA (Department of Health, 2014; Floros et al., 2014; Fu et al., 2011; Kanchanomai et al., 2011; Lau, 2011; Shek & Yu 2012; Spada et al., 2014).

2.2 Role and values of Personal Knowledge Management (PKM) in knowledge-based economy and tertiary education

In the past twenty years, researchers showed an increased interest in PKM. Frand and Hixson (1998) define PKM as a framework for individuals to organize information systematically, integrate into personal knowledge base and ultimately expand one's personal knowledge. The framework covers five key skills, including (i) searching/finding, (ii) categorizing/classifying, (iii) naming things and making distinctions, (iv) evaluating/accessing, and (v) integrating/relating. A number of studies quote another PKM definition by Dorsey (2000), who has defined PKM as a set of problem solving skills which is composed of physical and hands-on element (Ma et al., 2011; Zhuang et al., 2011). In addition, Jain (2011) adds that PKM is crucial to individuals at personal, working and social levels; and PKM is the foundation to organizational PKM and can enhance organizational productivity. In the same vein, Świgoń (2013) highlights that PKM is a multidisciplinary issue and it aims to equip individuals with skills and capabilities to survive in changing organizational and social environments. In addition to the inputs by Frand and Hixson (1998), seven PKM

skills proposed by Avery et al. (2001) - retrieving; evaluating; organizing; collaborating; analyzing; presenting; and securing information - are widely adopted in the latest PKM studies (Table 1).

Table 1: Frameworks using seven PKM skills

Literature	Objective(s)
Cheong and Tsui (2010)	A research model was developed to investigate the role of PKM in knowledge management and its values for both individuals and organizations.
Garner (2010b)	The study combined some of the seven PKM skills and established a four-level PKM model for students in learning
Jain (2011)	In order to implement PKM successfully, the author incorporated four key elements – including PKM skills, PKM awareness, harmonization of personal and organizational goals and organizational responsibilities – in the model.
Darvish et al (2013)	A framework was developed to examine the impact of academic qualification, educational course, gender and records of teaching on PKM in a university context.
Jafari et al (2013)	A model was developed to study to examine the relationship between PKM skills and organizational competencies (in the areas of external information awareness, internal knowledge dissemination, effective decision making, organization focus and continuous innovation).
Cheng (2015)	The study aimed to provide insights to develop PKM in Hong Kong teacher education.

After reviewing the roles of PKM, skills and models, it is also important to evaluate the values and benefits brought from PKM. Both individuals and organizations can benefit from PKM (Jefferson, 2006; Jain, 2011). Firstly, individual effectiveness is enhanced as PKM eliminate the problem associated with information overload. Cheong and Tsui (2010) have recently adopted seven dimensions from previous works to measure individual benefits – communication, creativity, problem solving, learning mental agility, analysis and reflecting. Enhanced Individual effectiveness leads to the improvement of collaborative capability and in turn improves the organizational effectiveness (Jefferson, 2006). Other benefits of PKM in previous studies are summarized in Table 2.

Table 2: Values and benefits of PKM

Literature	Individual	Organizational				
		external information awareness	internal knowledge dissimilation	effective decision making	organization focus	continuous innovation
Truch (2001)	+		+			+
Verma (2009)	+	+	+			+
Cheong and Tsui (2010)	+	+	+	+	+	+
Jafari et al (2013)		+	+	+	+	

In the higher education context, Garner (2010a) has integrated the abovementioned PKM skills with the learning model proposed by Oliver and Herrington (2001). The study elaborates that students retrieve lecture notes, e-books and e-journal articles, evaluate their quality and relevance and then organize the relevant information in paper-based or electronic-based notes. This illustrates the application of the first three PKM skills. Next, students are exposed to questions or problems in learning activities under the virtual learning environment. Through collaboration, students analyze the data together and present the solutions to lecturers. All electronic files are kept under a secure environment. This illustration is in line with the rest of PKM skills. According to Garner (2010a), students who have better management in personal knowledge perform better than those who do not.

2.3 Use of (Educational) technology in PKM (e.g. cloud-based, Web 2.0, social media, blog, e-learning/m-learning)

Technology plays a critical role in supporting PKM. In the era of e-learning, different PKM tools are available to the students. Lau and Tsui (2009) argue that PKM tools allow students to select, search and store content in their personal database and, as a result, searching time is minimized. Moreover, students are able to seek advices from experts through PKM collaboration tool, in turn, improving their problem-solving skills (Lau and Tsui, 2009, Garner, 2010a). A number of studies have addressed the adoption of Web 2.0 as the PKM tool (Table 3).

Table 3: Web 2.0 PKM Tools

Literature	Findings
Garner (2010b)	This paper explained how Software-as-a-Service (SaaS) support PKM in education environment.
Fang and Gong (2012)	This chapter analyzed several Web 2.0 PKM tools - Social Book Mark, RSS, TAG, and Personal Portal and searching tool – in facilitating knowledge acquisition, storage, sharing and using.

2.4 PKM as the intervening apparatus for driving positive use of Internet

Many current studies emphasize on the concepts of digital literacy and digital competency in the education sector (Hatlevik & Christophersen, 2013; Ferrari et al., 2012). Digital literacy is defined as the ability to access, understand, evaluate a variety of digital media critically, and communicate in different context effectively while digital competence refers to the confident, critical and creative use of information and communication technology in learning, work, leisure or participation in society (EU, 2006). With the use of a model (Figure 1), Calvani et al. (2009) put forward that there are three dimensions in the concept of digital competence. Firstly, technological dimension refers to the ability to explore new problem in a flexible way. Secondly, cognitive dimension is defined as the ability to read, select, and evaluate information. Thirdly, ethical dimension refers to the ability for individuals to collaborate effectively and in a responsible way. The intersection among the three dimensions allows learners to share and collaborate in a constructive way so as to develop new knowledge (Calvani et al., 2009).

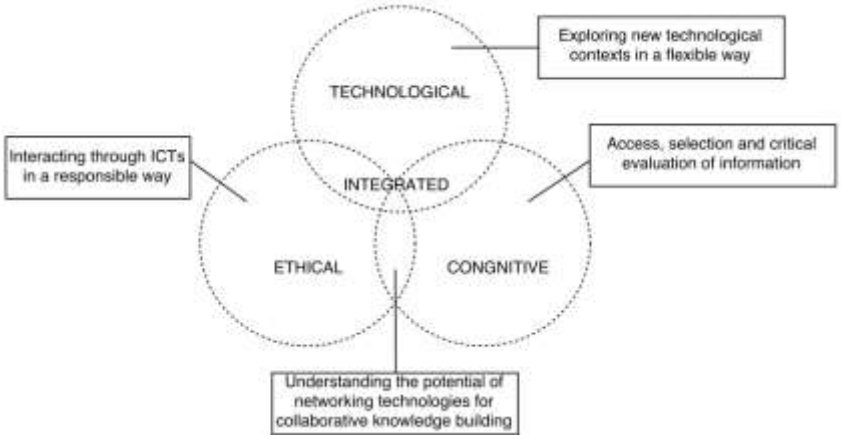

Figure 1: A Digital Competence Model
Source: Calvani et al (2009)

Table 4: Digital Competence

Area	*Description*
Information Management	Identify, locate, access, retrieve, store and organize information
Collaboration	Link with others, participate in online networks and communities, interact constructively
Communication and Sharing	Communicate through online tools, taking into account privacy, safety, and correct online behaviour
Creation of Content and Knowledge	Integrate and re-elaborate previous content and knowledge, construct new knowledge
Ethics and Responsibility	Behave in an ethical and responsible way, aware of legal frames
Evaluation and Problem-solving	Identify digital needs, solve problems through digital means, assess the information retrieved
Technical Operations	Use technology and media to perform tasks through digital tools

Source: Ferrari et al (2012)

In a later study by Ferrari et al. (2012), seven areas of digital competence are summarized (Table 4). These areas are aligned with the idea of PKM which focus on problem-solving, organizing and evaluating information, collaboration and generation of new knowledge. Under the Virtual Learning Environment (VLE), Ferrão et al (2009) argue that both e-knowledge and e-learning are the sources of e-competence. In order to acquire e-competence, Ferrão et al (2009) suggest different parties to pay attention to five components, namely, Environment (comprised of knowledge management, policies, leadership and culture); People (learners and academics); VLE; Technologies; and Outcomes.

In order to drive learners to use Internet positively and appropriately, it is a must for learners and students to acquire (digital) e-competence. As the two components of digital competence are knowledge management and learners, this paper argues that PKM can act as an intervening apparatus to drive college students to adopt a healthy use of Internet for personal development and academic attainment.

3. Framework

3.1 Dealing with misuses of Internet with a risk-based approach

Given the potential misuses of Internet, the authors suggest a risk-based approach in dealing with the pertinent health-related problems. In fact, a risk-based approach has been found relevant in an organizational setting in dealing with internal operational issues (Ng & Mitchell, 2009). This approach first identifies the risks associated and the potential adverse effects, such as Internet addicts, on the Internet users. Mitigating measures through PKM are then developed.

3.2 An interventionist approach for driving positive use of Internet

An interventionist approach is proposed to orient students in tertiary education to develop a strategic mindset that utilizes Internet as a tool to develop knowledge for achieving learning outcomes. In the medical model, Mayo Clinic (2015) suggests an intervention as being a carefully planned process that may be done by family and friends, in consultation with a professional, or directed by an intervention professional, the interventionist. An intervention usually includes the steps of making a plan, gathering information, forming the intervention team, deciding on specific consequences, making notes on what to say, holding intervention meeting, and finally the follow up. The Skills Commission (2013) of the United Kingdom has considered interventions as corrective measures to counter declining performance or overcome failure, and it is better for organisations to identify risks and issues early on, to enable them to intervene before problems escalate.

We propose that students adopt the PKM skills to utilize information provided through Internet. (Figure 2) These skills and digital competences are learned in the initiation of a study programme and reinforced in course delivery, which include course assessments and assignments provided. Students are advised on the validated sources, such as electronic databases and e-libraries that are well-recognized as knowledge bases for studying and learning.

The importance of orientation, on-going monitoring and reinforcing position habits through pedagogies is emphasized. A key potential benefit of this approach is to prevent students from adopting habits of using Internet that could cause health-related problems and develop into behaviours that inhibit their future developments.

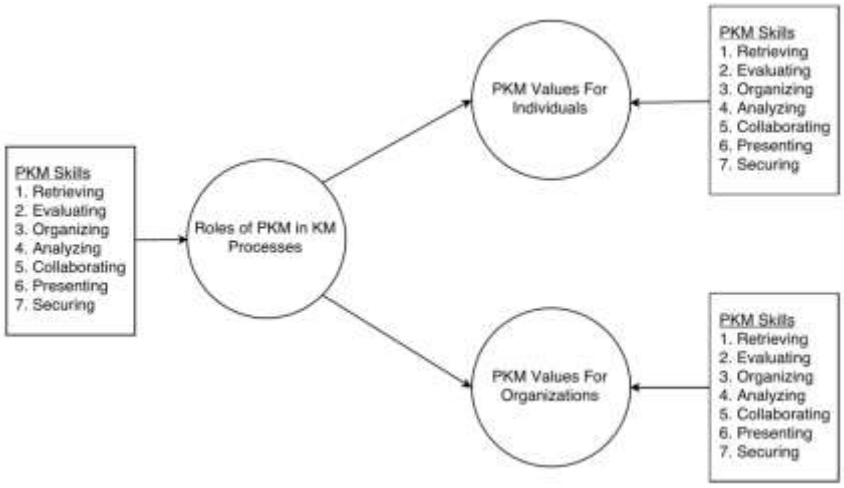

Figure 2: A PKM Model for Individuals and Organizations
Source: adapted from Cheong and Tsui (2010)

3.3 Optimal use of Internet with the main purpose of Personal Knowledge Management

Building on a set of digital competencies as suggested by Calvani et al. (2009), students should be given guidance on the need to develop appropriate personal and professional values in making sound judgments through experiential learning - assessing reliability and truthfulness of information available from Internet. They will also learn to formulate effective time allocation and management, thus minimising the risks associated with over-reliance or inadequate use of Internet.

3.4 Adopting an integrated conceptual framework

An integrated conceptual framework is proposed with the seven elements of PKM skills as the basis. A risk-based model is incorporated to evaluate the potential problems in the processes of using internet in the learning process. In fact, Kolb's learning model suggests a cycle of four stages of learning composed of (i) earning concrete experience, (ii) reflective observation of experience, (iii) the formation of abstract and generalizations (conclusions), and (iv) active experimentation, which would result in new experiences (Smedley, 2009). Furthermore, we advocate developing a dynamic cycle to integrate with the seven PKM activities that in turn support a comprehensive risk-mitigating approach as provided in Figure 3. Corresponding risk-mitigating measures to the seven PKM activities for healthy internet use are highlighted and summarized in Table 5.

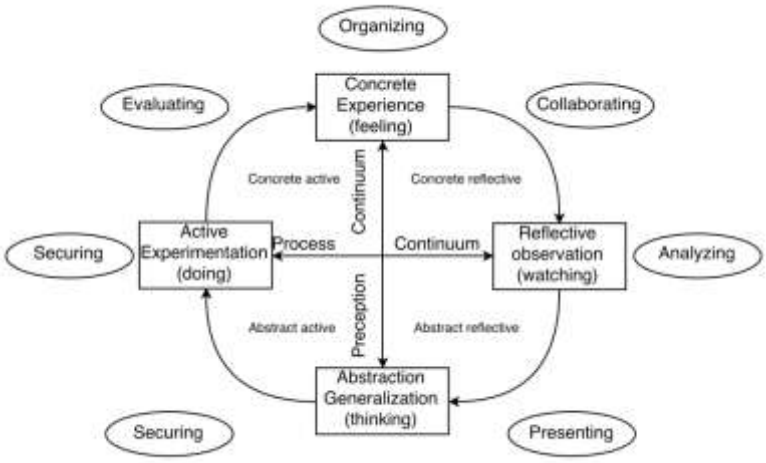

Figure 3: A Dynamic PKM Process for Healthy Internet use

Table 5: PKM Activities, Mitigating Measures and Potential Risk Exposures from Internet

PKM activities	Mitigating measures	Potential risk exposures from Internet
Retrieving	Gathering information from various sources; search information via Internet from various sources	Limited search engine knowledge Reliability of sources Cybersecurity concerns Internet addicts
Evaluating	Assessing data and information collected Evaluate quality and relevance of various pieces of information	Data and information inadequately assessed and relied upon Inadequate reliance on false or inaccurate information for decision making
Organizing	Organizing information and connecting pertinent information into various categories/directories	Collected information is compiled in unruly forms and structures
Collaborating	Sharing information with teams and groups in order to support collaborative work	Lack of sharing, communication and collaboration with communities
Analyzing	Converting information into knowledge through various tools, such as statistical software	Insufficient utilization of data and converting data or information into useful knowledge
Presenting	Externalizing understanding of new knowledge with a community	Lack of skills and motivation to disseminate and knowledge
Securing	Protecting information through proper security means	Lack of skills and practice in securing information

4. Discussion

Internet is clearly an important tool with the potential to improve information dissemination, including health promoting messages. Interactive technology can be applied in targeted health interventions and other behaviour change programmes to our youngsters. At the same time, developing efficient coping strategies in students and improving academic environments could contribute to mitigating the risks associated with the potential deleterious consequences of stress related to IA (Tavolacci et al., 2013). Researchers at the Chinese University of Hong Kong have suggested that university health workers should become acquainted with this common Internet-related health issue, and should consider Internet use patterns in affected cases. They also have proposed that future research should focus on developing evidence-based definition for IA by determining its psychological, pathological and physiological nature through extensive prospective studies (Kim et al., 2013; Lau, 2011).

An interventionist approach appears to be relevant to be applied in programme and course delivery in order to promote healthy use of internet and to orient students in tertiary education to develop a strategic mindset that exploits Internet as a tool to develop knowledge for achieving learning outcomes. We propose that students adopt the PKM skills to utilize information provided through Internet. These skills are learned in the initiation of a study programme and reinforced in course delivery, which include course assessments and assignments provided. Students are advised on the validated sources, such as electronic databases and e-libraries that are well-recognized as knowledge bases for studying and learning.

The importance of orientation, on-going monitoring and reinforcing position habits through pedagogies is emphasized. A key potential benefit of this approach is to prevent students from adopting habits of using Internet that could cause health-related problems and develop into behaviours that inhibit their future developments. On the other hand, although Internet use is associated with a decline in face-to-face contacts, it serves as a beneficial stress coping strategy, albeit inadequate, because more social contacts, social networking, improving the chance of meaningful relationships, self-confidence, social abilities, and social support are due to the use of Internet (Bergmark, Bergmark & Findahl, 2011; Tavolacci et al., 2013).

5. Concluding remarks

To enhance effective learning of the generation under “Internet of Things”, we advocate development of an integrated model based on PKM approach to enhance healthy internet use in a learning environment while mitigating risks exposures from exhaustive utilization of Internet under a virtual environment. To test its efficacy, we propose

this model could be initially refined and implemented in a course with hybrid mode to incorporate both online and offline strategies. In addition, we suggest complementarity of face-to-face communications in enhancing learning of youngster as part of their whole-person developments. Digital competence as advocated by Calvani et al. (2009) can be considered a key part of the foundation training but could be enhanced further with the practice of our proposed PKM approach.

Nevertheless, students should be given guidance on the need to develop appropriate personal and professional values in making sound judgments through experiential learning - assessing reliability and truthfulness of information available from Internet. Face-to-face communications and group learning activities are complementary in the intervention. Students will also learn to develop effective time allocation and personal management skills, thus minimising the risks associated with over-reliance or inadequate use of the Internet.

In future studies, case study approach and action research can be adopted to investigate the effectiveness of PKM in enhancing healthy internet use (Yin, 2003; Koshy et al., 2011). The strength of action research lies in its focus on developing solutions to practical problems and its ability to accommodate practitioners, by enabling them to engage with research and the subsequent implementation activities. In fact, practitioners can choose to research their own practice or a researcher can be engaged to look into any problems, to implement practical solutions and to systematically monitor the process of change.

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