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Healthy Use of Internet and Personal Knowledge Management in Knowledge-based Economy and Tertiary Education

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ABSTRACT

Recent studies on the 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. There are a role and values of Personal Knowledge Management (PKM) for an optimal use of Internet. With reference to an interdisciplinary review, we suggest an interventionist approach 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.

KEYWORDS: Internet Use, Personal Knowledge Management, Knowledge-based Economy, Tertiary Education

1 INTRODUCTION

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 is no longer the savvy for the elites in modern day societies. (Bergmark, Bergmark and 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. Internet users also enjoy anonymity, social networking, no geographic boundaries, and free information. (Lau et al., 2008; Shek, Tang and 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 and 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.

On the other hand, a number of treatments and interventions have been explored. 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. Their studies show that rationalizations have led to a reduction in compulsive use. Young also suggests that other treatment modalities such as psychodynamic therapies, gestalt, group counselling, or in vivo counselling within an online community should be explored in future research to determine their therapeutic impact and efficacy (Young, 2007 & 2011).

Undoubtedly there is a huge potential burden of IA among university students. A local study (unpublished) on university students has found over 80% of the respondents would browse on the internet in leisure time for more than 3 hours each day. The continued lack of consensus may place this group at risk of inadequate or improper interventions (Lau, 2011).

2 INTERDISCIPLINARY REVIEW

2.1 Increasing concerns over misuse of Internet 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 uses, both online and offline, for betterment of an overall well-being. (FU et al., 2010; Lau, 2011; Lee and Loke, 2005; Leung and Lee, 2012) (Ma, 2011).

There have increasing concerns over Internet misuses 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 and Ak, 2014; Randler, Horzum and Vollmer, 2014; Shek and Yu, 2012; Sun et al., 2012; Tavolacci et al., 2013; Thomas and Martin, 2010; Tokunaga, 2014; Xu et al., 2012).

On a positive note, 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 and Findahl, 2011; Tavolacci et al., 2013).

Furthermore we must acknowledge the fact that Internet use is not only strongly encouraged but is mandated by nearly all higher education institutions. Students must use emails regularly to remain current with teaching, learning and administration communication. Therefore, the Internet use policies at universities may lead to IA development among some students. (Tokunaga, 2014).

2.2 Health considerations when Internet technology is misused/abused (Internet addiction)

In 2014, the Department of Health commissioned the Report of Advisory Group on Health Effects of Use of Internet and Electronic Screen Products. The interdisciplinary Advisory Group composed of experts from clinical specialties, psychology, education, information technology, social services, and youth group. Fourteen physical and psychosocial health concerns were identified and reviewed. Ten health tips were also recommended. (Department of Health, 2014). The results are summarized in Tables 1a, 1b and 1c.

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i.	Physical fitness and obesity: screen time, sedentary lifestyle, snacking
ii.	Vision: ocular discomfort, eyestrain, dry eye, headache, blurred vision and
	even double vision
iii.	Musculoskeletal problems: fixed postures
iv.	Hearing: sound at harmful levels, permanent hearing damage
v.	Injury and accident: use while doing other tasks
vi.	Infection: potential risk in spreading pathogens
vii.	Health concerns relating to radiofrequency electromagnetic field: no
	conclusive evidence to show radiofrequency signals can cause cancer

Table 1a: Concerns over Physical Health

Table 1b:	Concerns	over	Psv	ychosocial	Health
			_		

i.	Addiction: affecting the more important tasks or daily routine
ii.	Cyber-bullying: psychosocial consequences
iii.	Cognitive development and learning
iv.	Social development
v.	Sleep deprivation: affecting growth and development
vi.	Online sexual risky behaviour: associated with other adverse psychosocial
	health problems
vii.	Aggressive behaviour

Table 1c: Ten Health Tips

i.	Be physically active
ii.	Engage in interactive activities in real life
iii.	Limit screen time and choose screen activities wisely
iv.	Blink, break and rest
v.	Adopt proper setting
vi.	Protect hearing, prevent accident and pay attention to hygiene
vii.	Ensure adequate sleep time and appropriate environment
viii.	Be aware of cyber-safety
ix.	Behave oneself when using Internet and social networking sites
x.	Restrict access to inappropriate content

These 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 is noted that comorbid psychopathology is likely to exacerbate the presentation of IA (Floros et al., 2014; Fu et al., 2011; Kanchanomai et al., 2011; Lau, 2011; Shek and Yu, 2012; Spada et al., 2014).

Academics have been sounding out concerns and proposed prevention and intervention programmes for IA, which should be implemented at the community, school, family, and individual levels (Shek and Leung, 2013; Shek and Yu, 2013). A learning model for prevention, comprising internet addiction diagnosis, preventive educational materials and preventive activities is proposed for teachers (Lim, Bae and Kim 2004). A Multi-level counselling programme, together with positive youth development, has been developed by Professor Shek and his team at the Hong Kong Polytechnic University in recent years (Shek, Tang and Lo, 2009; Shek and Yu, 2012). In addition, Professor Ma of the Hong Kong Baptist University has suggested a holistic program to provide a comprehensive and general basis for the development of a healthy body and mind. This appears to be more effective than a specific program that focuses mainly on the use of Internet (Ma, 2011).

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 preventing the potential deleterious consequences of stress related to IA (Tavolacci et al., 2013). Researchers at the Chinese University of Hong Kong suggest 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).

2.3 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 the field of PKM. Frand and Hixson (1998) define PKM as a conceptual 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 and finding, (ii) categorizing and classifying, (iii) naming things and making distinctions, (iv)evaluating and accessing, and (v) integrating and 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) further 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) - (1) retrieving; (2) evaluating; (3) organizing; (4) collaborating; (5) analysing; (6) presenting; and (7) securing information - are widely adopted in latest PKM studies (Table 2).

	Table 2. Frameworks using seven F Kivi skins
Author(s) & Year	Objective(s)
Pauleen et al. (2009)	A conceptual framework was developed to examine the impact of PKM skills, technology, user context and skills-tools fit on knowledge capture and development.
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.

 Table 2: Frameworks using seven PKM skills

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). First, individual effectiveness is enhanced as PKM eliminate the problem associated with information overload. Cheong and Tsui (2010) 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 3.

Table 3 : Values and benefits of PKM							
Author(s) & Year	Individual	Organizational benefits					
	benefits						
		External information awareness	internal knowledge dissimilation	effective decision making	organization focus	continuous innovation	
Truch (2001)	+		+			+	
Wright (2005)	+	+	+	+	+	+	
Razmerita et al. (2009)	+	+	+	+		+	
Verma (2009)	+	+	+			+	
Cheong and Tsui (2010)	+	+	+	+	+	+	
Jafari et al. (2013)		+	+	+	+		

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In the higher education context, Garner (2010a) integrated the abovementioned PKM skills with the learning model proposed by Oliver and Herrington (2001) (Figure 1). The study elaborates that students retrieve lecture notes, e-books and e-journal articles, evaluate their quality and relevance and then organize those 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 analyse 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.



Figure 1: Learning model incorporated with PKM skills Source: Modified from Garner (2010a)

2.4 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 for 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 students' 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 4).

Author(s) & Year	Major findings
Li et al. (2008)	Authors discussed the use of two Web 2.0 tools – Blog and RSS – in postgraduates' PKM. The study provided several initiatives, for instance, expanding information sources, establishing personal e-portfolio, promoting knowledge sharing and conversion, promoting reflective learning.
Li and Li (2009)	This study showed that blog-based PKM is able to meet the needs of learners. It can help to capture, store, create and share knowledge.
Razmerita et al. (2009)	The study reported that six Web 2.0 tools are available for PKM – individual web portal, personalized searching tool, discussion forum, social bookmarking, virtual world and blog/wiki. These tools facilitate several knowledge management processes, for instance, creation, codification, sharing, collaboration and organization.
Garner (2010b)	This paper explained how Software-as-a-Service (SaaS) support PKM in education environment. With the use of Google Docs, author showed that PKM is enhanced in four areas – retrieving, organizing, analysing/collaborating and presenting information.
Fang and Gong (2012)	This chapter analysed several Web 2.0 PKM tools - Social Book Mark, RSS, TAG, and Personal Portal with network storage, email, instant messenger and searching tool – in facilitating knowledge acquisition, storage, sharing and using.
Ismail et al. (2013)	The study examined how university adult learners manage learning and personal knowledge with social networking tools. Result exhibited that getting knowledge, understand knowledge, sharing knowledge and connecting to knowledge source have a positive impact on PKM in learning.

Table 4:	Web	2.0	PKM	Tools
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2.5 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 (Ala-Mutka et al., 2008; Hatlevik and Christophersen, 2013; Gui and Argentin, 2011; Ferrari et al., 2012). Digital literacy is defined as the ability to (1) access, (2) understand, (3) evaluate a variety of digital media critically, and (4) 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 2), Calvani et al. (2009) put forward that there are three dimensions in the concept of digital competence.

First, 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 three dimensions allows learners to share and collaborate in a constructive way so as to develop new knowledge (Calvani et al., 2009).



Source: Adapted from Calvani et al. (2009)

Table 5: Areas of Digital	Competence
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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: Adapted from Ferrari et al. (2012)

In a recent study by Ferrari et al. (2012), seven areas of digital competence are summarized in Table 5. 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 the both e-knowledge and e-learning are the sources of the e-competence. In order to acquire e-competence, Ferrão et al. (2009) develop a framework and suggest different parties to pay attention to five components (Figure 3) – (1) Environment (comprised of knowledge management, policies, leadership and culture); (2) People (learners and academics); (3) VLE; (4) Technologies; and (5) Outcomes.



Figure 3: Framework connecting e-knowledge, e-learning and e-competency

Source: Adapted from Ferrão et al. (2009)

In order to drive learners to use Internet positively and appropriately, it is necessary for learners and students to acquire digital competence or e-competence. As two key components of digital competence are pertinent to knowledge management and learning abilities, it is argued 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 CONCLUDING REMARKS

An interventionist approach appears to be relevant in the applications 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.

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 management skills, thus minimising the risks associated with over-reliance or inadequate use of the Internet.

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