Adoption of a Personal Learning Environment & Network (PLE&N) to Support Peer-Based Lifelong Learning

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0169

The Asian Conference on Society, Education and Technology 2013

Official Conference Proceedings 2013

Abstract

The 21st century is the knowledge and digital era. The issues of changing conditions and information overload challenge people's abilities to learn. Moreover learning is becoming more learner-centric and network-based, and the traditional way of learning may not be effective enough to keep up with the pace of emerging knowledge. Learners need to develop their personal learning systems (personal learning environment & network, PLE&N in short) to integrate and foster learning activities. This paper discusses the use of a virtual PLE&N to support learning and describes its benefits.

Learners have different learning competencies, preferences and objectives. To respond to this diversity, learning should be personalised. On the other hand, there is an increasing trend that people learn from trusted networks, as knowledge is distributed across connections. To meet the contemporary challenges and learning trends, a PLE&N is established. Changes in technology provide a variety of tools for people to develop their own learning systems. Many of these tools are Web 2.0 tools, including discussion forums, file/video sharing, RSS feeds and social networks. Learners can also use these tools to build up networks for co-learning and locating expertise. In general, a PLE&N serves as a platform fostering self-regulated and network-based learning, resulting in problem solving, collaboration and innovation.

This paper describes a case study of how a group of students establishes and uses a PLE&N to facilitate learning in a Hong Kong university. It is hoped that insights provided would be helpful for teachers and students to adopt technology-enhanced learning to meet the contemporary challenges.

Introduction

In the knowledge and digital era, people are facing many challenges and changing their learning trends. These challenges include unstructured and fast-changing conditions, information overload, and advancements in technology. Situations that people have to tackle are often novel and they have to learn constantly and to search for information to support decision-makings; the amount of information available is huge, making it difficult and time-consuming to locate the right information and digest it. Changes in technology also require people to update their knowledge constantly. On the other hand, learning is becoming more learner-centric and network-based (Tsui & Cheong, 2013). Learners have different learning competencies, preferences and objectives. To respond to this diversity, learning needs to be personalised. Moreover, there is an increasing trend that people learn from trusted networks, as knowledge is distributed across connections and networks (Dabbagh & Kitsantas, 2012a; Leone, 2013).

The traditional ways of learning, including attending classes and going to libraries, have limitations in meeting the contemporary challenges and learning trends, as they tend to be restrictive in geography and require more time. They may not be efficient enough to keep up with the pace of emerging knowledge. Learners need to develop their personal learning systems to integrate and foster learning activities. This paper discusses the use of PLE&N to support learning and its benefits. A literature review on personal knowledge management and personal learning environment & network (PLE&N) is first given, followed by an example illustrating how a PLE&N is used to support learning and teaching in The Hong Kong Polytechnic University (PolyU), and a discussion on factors affecting the continued use of a PLE&N. The research framework is described in the following section. The research work is on-going, and the data collection and analysis are expected to be completed by middle of next year.

Literature Review

Personal Knowledge Management

The development of personal knowledge management (PKM) has led to the development of PLE&N. Learning changes from behaviourism, in which learning occurs through controlled stimulus or response conditioning, to constructivism, in which knowledge is constructed through the dynamic interaction of new information and existing knowledge, and finally to connectivisim, in which learning occurs through social contact. Knowledge resides in a network and one needs to develop and expand a network to leverage on the collective wisdom, and to do so on a continuing basis. Hence to give a literature review of PLE&N, it is more appropriate to first give a review on PKM.

A number of definitions regarding PKM exist and there is no universally agreed definition. People have also been practicing activities related to PKM without articulating the term (Cheong & Tsui, 2010). Nevertheless, the numerous definitions of PKM can be categorized into skill-centric and technology-centric.

Regarding the skill-centric definition, Avery, Brooks, Brown, Dorsey and O'Conne (2001, p.4) defined PKM as personal self-awareness – “an understanding of how much they know, how to access the things they know, strategies for acquiring new

knowledge and strategies for accessing new information as needed". On the other hand, Barth (2004, p.356) gave a technology-centric definition, and defined PKM as "a range of relatively simple and inexpensive techniques and tools that anyone can use to acquire, create and share knowledge, extend personal networks and collaborate with colleagues". The technology-centric definition given by Barth (2004) suits the context of this paper.

Cheong and Tsui (2011) summarised the trends of PKM over a 12-year period. There are a few focuses among PKM studies, and two most relevant to this research are (i) technologies and tools, and (ii) learning and networks. Technologies are facilitators for undertaking PKM. Selecting and using tools appropriately is essential for an effective PKM (Agnihotri & Troutt, 2009; Barth, 2004). Advancement in technologies has given rise to Web 2.0 technologies that are online applications or platforms where users can interact and collaborate with each other. Users of Web 2.0 technologies are also contributors of content. Examples of Web 2.0 include blogs, discussion forums, file/video sharing, open office, RSS feeds, social networks and wikis. They are very popular for personal use. It is also suggested that Web 2.0 technologies have created new opportunities in learning and teaching (Taraghi, 2012). The rise of mobile devices is also another key compelling force, where learners use mobile devices in different contexts. In fact, personal mobile devices allow users to have access to learning resources and applications at any time and place, and hence support self-regulated learning (Taraghi, 2012). Self-regulated learning is the ability to be fully aware of the need for further learning and to accomplish learning proactively (Leone, 2013).

The key emphasis of learning and networks lies on connecting with the right people, rather than getting the right information (Jarche, 2010). People often have to tackle new problems and they need the right information for decision-making. However, the issue of information overload makes it difficult and time-consuming to locate and digest the right information. Occasionally the stream of problems that people need to tackle is so wide that it is almost impossible for them to learn everything. Hence it is strongly recommended that people connect with subject matter experts and get advice from them. Jarche (2010) is in favour of this argument, and he suggests that the value of knowledge is enlarged when it is shared among communities. People co-learn and locate expertise in the communities.

Personal Learning Environment & Network

Personal learning environment & network is a learner-centric platform fostering self-regulated and network-based learning (Dabbagh & Kitsantas, 2012a; Leone, 2013). Another similar definition of a personal learning environment is the "combination of different tiny applications" which is "within a framework and with strong relationship to learning aspects" (Dabbagh & Kitsantas, 2012b; Taraghi, 2012). PLE&N is a generic term and a concept instead of a specific software package. As such, many different variants of PLE&N systems, like personal knowledge environment (Dabbagh & Kitsantas, 2012a; Leone, 2012) and personal knowledge networks (Caldwell, 2002; Mohamed, 2012), exist in studies of PLE&N.

One of the key focuses of PLE&N is the use of technologies. Advancements in technology provide a variety of tools for people to develop their own learning systems. Many of these tools include Web 2.0 tools, which are pervasive, ubiquitous and

bottom-up. Learners have the freedom and responsibilities to decide and select which tools best fit their learning purposes. They can also use tools to build up networks for co-learning and locating expertise.

Use of a PLE&N to Support Learning and Teaching at PolyU

PLE&N has been used to support learning and teaching at The Hong Kong Polytechnic University (PolyU). Two of the tools that have been used are RSS feeds and social networking software.

Regarding the use of RSS feeds, the teacher has to first identify quality sources of information related to the subject and to incorporate these sources of information into a RSS reader. The sources of information are exported using the RSS reader and shared with students. Students can then import the file and start getting feeds and reading the information. When students identify good sources for information, they are welcomed to recommend the sources for the teachers. The sources of information are very useful for students in getting them to read more apart from the formal teaching materials, and to help complete assignments and projects, as they usually require a lot of good quality references.

Regarding the use of social networking software, students are asked to create an account on a social networking site, and then their accounts are grouped. This is being done for each of the classes in which the PLE&N is to be deployed. Once the PLE&N has been deployed, anyone who belongs to the group can read and post, as well as freely discuss any articles that are tagged in the PLE&N. For example, a student posted link about learning tools after hearing the lecturer mentioning the list of learning tools in class (**Error! Reference source not found.**). Discussions are followed about the geographical effects on the learning tools. Students can also post supplementary information about assignments and other insightful materials.

To ensure sustainability of the PLE&N environment, the tools chosen to set up the PLE&N are free, easy to adopt and easy to use. They also provide settings to allow personalization. To help ensure the quality of the content created in the PLE&N, teachers usually have to initiate the sources of information and monitor the discussions among students. These are done to ensure academic integrity and the quality of the learning material inside the PLE&N. In order to encourage participation in the PLE&N, teachers usually give rewards to students who participate actively. For example, one teacher has allocated 10% of the total score of a subject to student's participation in the PLE&N.

After one semester, students have the freedom to decide if they would continue to use the PLE&N or stop using it. It is found that, after the class ended, some students still participate actively in the PLE&N, while some participate occasionally and some discontinue very soon. This phenomenon gives rise to studying the interesting question of why people adopt learning tools for varying periods of time.

Figure 1 Use of Social Networking Site to Support Teaching and Learning

The Research Framework

After an intensive review on adoption and usage literature (Ajzen, 1991; Bhattacherjee, 2001; Davis, 1989; Fishbein & Ajzen, 1975; Karahanna, Straub, & Chervany, 1999; Lippert & Forman, 2005; Moore & Benbasat, 1991; Ouellette & Wood, 1998; Parthasarathy & Bhattacherjee, 1998; Rogers, 1995; Thompson, Higgins, & Howell, 1991; Thompson, Higgins, & Howell, 1994; Venkatesh & Brown, 2001; Venkatesh & Davis, 2000; Venkatesh, Morris, Davis, & Davis, 2003), it is found that five factors affect the continued use of an information system. These five factors are perceived usefulness, compatibility, social influence, personal affect and past use. The way that these five factors affect continued use is shown in Figure 2. Except for the dual effect of past use, all other constructs affect continued use through the intention to continued use. Each of the constructs is discussed as follows,

- Perceived usefulness
  Perceived usefulness is a frequently mentioned construct in studies on information system adoption. It appears in the technology acceptance model (Davis, 1989). It measures the extent that a person believes using a system would be beneficial.

  The theory of belief updating suggests that prior belief and evaluation is constantly updated by succeeding events and experience (Kim & Malhotra, 2005). Hence when users gain experience with the information system, the perceived usefulness regarding the system will be updated.

- Compatibility
  Compatibility appears in the innovation diffusion theory (Moore & Benbasat, 1991). It measures the extent that an information system is perceived as being consistent with existing needs and past experiences of the users. It is found to be a significant predictor for continued use (Karahanna et al., 1999).

- Social influence
  Social influence appears in different adoption models and theories in the form of different names, including the subjective norm in the technology acceptance model (Davis, 1989), social factors in the model of personal computer utilization (Thompson et al., 1991) and image in the innovation diffusion theory (Moore & Benbasat, 1991). It measures an individual's perception that people who are important to him/her think if he/she should use certain information system.

- Personal affect
  Similar to the construct of social influence, personal affect appears as affect towards use in the model of personal computer utilization (Thompson et al., 1991) and affect in the social cognitive theory (Compeau & Higgins, 1995). It measures an individual's feelings of joy, pleasure or liking towards a particular act.

- Past use
  Experience with information system use is commonly regarded as a moderator in adoption studies. There are studies, however, suggesting that there is a positive effect of past use on future use (Jasperson, Carter, & Zmud, 2005; Venkatesh & Davis, 2000; Venkatesh et al., 2003). The self-perception theory states that people observe their own behaviour as an outsider (Kim & Malhotra, 2005). Hence, when the usage of an information system increases, the usage would affect a user's intention or evaluation for future use.

  Past use affects continued use in two ways: a direct effect and an indirect effect through intention to continued use (Figure 2). The direct effect occurs when the contexts of usage are stable and the usage becomes habitual. The self-perception theory states that people do not evaluate their routine behaviour until they are asked to do so (Kim & Malhotra, 2005). Conscious awareness is not involved when performing habitual acts, hence resulting in a direct effect. The indirect effect takes place when the contexts of usage are unstable, and do not trigger or induce habitual acts. Conscious awareness is

involved when performing the act. The effect of past use on continued use is mediated through intention in the indirect effect situation.

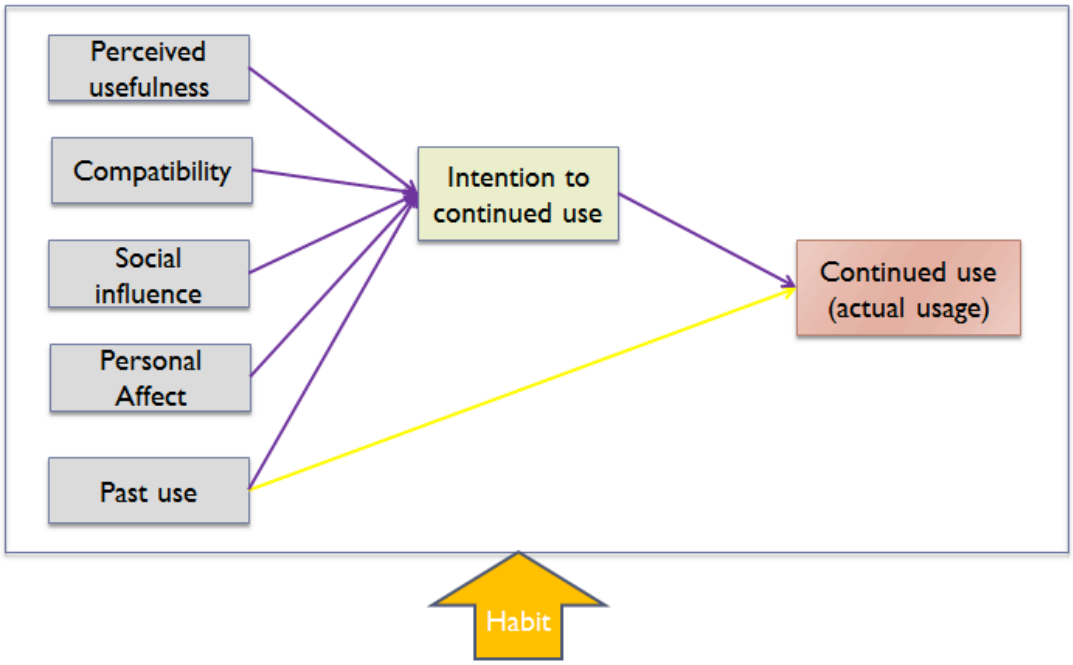

Figure 2 Research Framework

Conclusion

This paper outlines the use of a PLE&N to support peer-based lifelong learning – the contemporary challenges, as well as the learner-centric and network-based learning trends. The case at PolyU has clearly demonstrated the feasibility of using Web 2.0 technologies to establish a PLE&N, and the ways it can be used to support teaching and learning. For such usage to be beneficial and sustainable, appropriate measures need to be established to ensure the quality of adopted tools, the information sources and the content contributions. Finally a research framework incorporating several potential factors that would affect the continued use of an information system has also been presented.

Future Work

The authors will collect data by conducting a survey among students, including undergraduates, postgraduates and graduates, of The Hong Kong Polytechnic University. At this moment, the research framework has been proposed and the questionnaires have also been drafted. The authors will proceed with the pilot test of the questionnaire, launch of the filed survey, data analysis and preparation of future publications. It is expected that all work will be done by the middle of next year. The authors look forward to sharing the results with others in subsequent publications.

Acknowledgement

The work described in this paper was partly supported by the Research Committee of The Hong Kong Polytechnic University under student account code RTC7. Its support is gratefully acknowledged.

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