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Exploring individual, social and organisational effects on Web 2.0-based workplace learning: a research agenda for a systematic approach

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Web 2.0-based workplace learning is defined in this article as informal learning that takes place in the workplace through connections and collaborations mediated by Web 2.0 technology. Web 2.0-based workplace learning has the potential to enhance organisational learning and development. However, little systematic research has been published that explores how individual, social and organisational factors may influence Web 2.0-based workplace learning. This study aims to address this knowledge gap. Drawing on a selective review of the theories and research on social exchange, social capital, communities of practice and organisational support, we have developed a testable theoretical model for further empirical study.

Keywords: Web 2.0; workplace learning; social exchange; social capital; communities of practice; organisational learning and development

Introduction

The application of Web 2.0 technology in professional, social and organisational contexts has rapidly gained momentum over the past few years. Social networking sites (SNSs), for example *LinkedIn* and *Facebook*, have been widely embraced internationally. LinkedIn (2011) claims to be the world's largest professional network, with more than 100 million members in over 200 countries. There are currently more than 2 million companies with pages on *LinkedIn*, and it is reported that there were nearly 2 billion searches on *LinkedIn* in 2010 (LinkedIn 2011). Some independent studies on SNSs reveal that approximately one-third of employees are in the *Facebook* network (Facebook 2011), and an equal number of employees have *LinkedIn* accounts (e.g. Skeels and Grudin 2009).

Web 2.0 has been heralded as having the potential to enhance learning because it presents a dynamic social platform where members can share, participate, interact, create and learn (Lucas and Moreira 2009). Along with the growing interest in Web 2.0 is a significant body of research that investigates the pattern of user behaviour with Web 2.0 in the workplace. However, there is surprisingly little systematic research into Web 2.0-based informal learning in the workplace.

García-Peñalvo, Colomo-Palacios, and Lytras (2012) find that there is generally a lack of acknowledgement of Web 2.0-based informal learning, both inside and

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outside organisational contexts. Chiu, Tsai, and Fan Chiang (2013) consider that research on web-based continuing learning is in its infancy. Li and Law (2012) point out that information and communications technology (ICT) facilitates managerial workplace learning, but it is unclear how this happens. Therefore, we consider that a need exists to study, and make visible, Web 2.0-based informal learning, in order to tap its potential for organisational learning and development.

Bock *et al.* (2005) study behaviour intention formation in knowledge sharing, and find that extrinsic motivations, social–psychological forces and organisational climate factors all contribute to knowledge sharing. Drawing on these findings, we develop our primary research question: how do individual motivations and social and organisational contextual factors affect Web 2.0-based workplace learning? The answer to this question will help understand the nature and process of Web 2.0-based workplace learning, in terms of employees' participation and motivation. Furthermore, our study will show why employees contribute and share knowledge using Web 2.0-based technology, such as SNSs, as well as the role of organisations in the process. Drawing on a selective literature review on models and theories related to social exchange, social capital and communities of practice (CoP), as well as organisational support, we aim to develop a testable theoretical model for further empirical study.

In the following sections, we first define the scope of our study, and then review the literature on workplace learning. We also review the literature on the foci of this study that is the use of Web 2.0 in the workplace and in learning. After that, we review the theories and research on social exchange, social capital, CoP and organisational support. Based on the review, we formulate hypotheses and propose a testable theoretical model for future research before concluding this article.

The scope of the study

Workplace learning takes place both formally and informally. Formal workplace learning refers to the learning processes and activities that employees are required to participate in, and that are immediately applicable to employees' job duties and/or roles (Raelin 1998). These processes and activities range from developing basic to high-level skills in technology, through to developing competency in management (Raelin 1998). Such learning is usually acquired through institutionalised workplace training programmes, and contributes to organisational learning.

However, the model of 70-20-10, developed by Lombardo and Eichinger (1996) suggests that around 90% of workplace learning is informal. Informal workplace learning has several features, dissimilar to formal workplace learning. Watkins and Marsick (1992) identify seven characteristics of informal learning in the workplace. These are: (1) learning from experience, (2) the organisational context, (3) a focus on action, (4) non-routine conditions, (5) the tacit dimension of knowledge, (6) delimiters to learning (which influences the way a problem is framed and the extent of work capacity) and (7) enhancers of learning. Lombardo and Eichinger (1996) conceptualise the key attributes and process of informal learning in the workplace. People learn from doing (experience) and from interaction with each other in an informal way, and the learning is closely related to workplace problem solving. The conceptualisation suggests that an organisation can play an important role in the learning process. As the workplace environment is a social context, informal learning in the workplace often takes place in a dialectical and on-going process, where

learning is acquired through collaboration, mutual problem-solving and the sharing of experience.

Based on the prior discussion, we conclude that workplace learning is shared, context-or task-based, it is organisationally goal-oriented and organisationally culture-bound, and contributes to, and is influenced by organisational learning. This article studies workplace learning gained through connections and collaborations mediated by Web 2.0 applications. This learning is largely neither institutionalised nor controlled by institutions. We, therefore, define Web 2.0-based workplace learning as informal learning that takes place in the workplace through connections and collaborations mediated by Web 2.0 technology. We limit the scope of our study to informal workplace learning.

The literature on informal learning and the use of Web 2.0 in the workplace is vast and covers a broad range of theoretical perspectives, levels of analysis and research methodologies. To ensure the rigor and focus of our literature review, we have chosen three categories of literature: original works focusing on developing theoretical perspectives (e.g. social capital theory) or defining new technology (e.g. Web 2.0); research articles that study the theoretical perspectives and new technology; press reports on the latest developments relevant to this study.

We have used three criteria in selecting the literature in each category. First, the literature with a primary focus on developing theoretical perspectives should be authoritative, and be capable of explaining the effects of individual and/or social factors on informal learning (e.g. Homans 1958; Thibaut and Kelley 1959; and Blau 1964, on social exchange theory). Second, the studies that we have cited must be well-grounded in either established theories (e.g. CoP) or empirical research, or both, and were published in reputable academic journals and conferences. Third, the press reports that we have selected must be released from the original sources (e.g. *LinkedIn*).

Web 2.0 in the workplace

Web 2.0 technology and its potential for learning

Web 2.0 is defined as the second generation of Web technologies which allows users to connect and interact with one another. Thus, it is also called the "social Web" (O'Reilly 2005). Wigand, Wood, and Mande (2010) define Web 2.0 as a paradigm shift in which users create content. McLoughlin and Lee (2007) describe Web 2.0 as a personalised and communicative form of the Internet, which enables active participation, connectivity, collaboration and sharing of knowledge and ideas among users. These definitions indicate the key functions and capabilities of Web 2.0. But due to its newness, there is no consensus in the way that Web 2.0 is defined (Boyd and Ellison 2007).

In terms of learning, Web 2.0 technologies are said to offer several opportunities to facilitate collaborative learning. A study by Skeels and Grudin (2009) finds that people use Web 2.0 for professional information gathering, and they locate or offer expertise through online CoP on SNSs. Status updates and/or posts on SNSs help members remain current, both with trends in their own field, and with new developments and changes in other members' professions and industries. Together, these may shed insight into broader professional trends in the future. The study of Lucas and Moreira (2009) shows that blogs are a forum for discussion and reflection,

wikis are used for developing group collaborative projects, podcasts and webcasts are means for presenting and sharing learning contents, ideas and expertise, and Twitter updates peers on news and new developments in the professional arena.

The applications of Web 2.0 in the workplace

There is a significant body of research that looks into the pattern of user behaviour with Web 2.0 in the workplace. Employees tend to use blogs, social bookmarks and wikis to a greater extent when searching for, and obtaining company information, than when attempting to connect with fellow employees or for relationship building (Hasan and Pfaff 2006; Jackson, Yates, and Orlikowski 2007; Kim, Lee, and Hwang 2008). Other research shows that the main purpose of using SNSs, for example *Facebook*, in the workplace is to maintain and develop connections with non-work friends, whereas *LinkedIn* is mainly used to develop professional networks with people outside and/or within a user's company. For example, the results of a survey show that most employees use an SNS at *Microsoft*, they use *Facebook* for four purposes: to maintain awareness of colleagues, to build rapport and stronger working relationships, to reconnect with former colleagues and to build social capital (Skeels and Grudin 2009).

DiMicco *et al.* (2009) studied the use of *Beehive*, an SNS at *IBM*. The study found that the most popular action taken on *Beehive* was to connect with others on a personal level, with 81.4% of users making at least one connection on the site (DiMicco *et al.* 2009). The study also found that *IBM* employees used *Beehive* to share a blend of both personal and professional information. The study focuses on the technical issues in design and the features of an Intranet-based SNS, and does not discuss, in any depth, the actual value of the SNS to the company. Nor does the study discuss the impact that the SNS has on employees' connection and collaboration. Nevertheless, the study is one of the few that examines in detail the behaviour patterns of SNS adoption in the workplace.

The adoption of Web 2.0 in the workplace has raised several issues and challenges for organisations. One of the most important effects of Web 2.0 on employees is that it blurs the boundaries between personal and professional lives, as well as personal and professional connections (Kreiner, Holensbe, and Sheep 2009). SNS usage in the workplace is debated equally as much as the use of email and instant messaging. For example, concerns are raised by managers and employers that their employees may spend a significant amount of work time on SNSs, thereby dealing with non-work-related personal affairs in company time (Shepherd 2011).

From the results of their survey and interviews, Skeels and Grudin (2009, p. 95), identify four key issues in SNS usage in the workplace: "the legitimacy of any workplace use of social networking software, tensions from mixing personal and professional personas, lack of delineation of hierarchy, status, or power boundaries, and the risk of inappropriate communication across the firewall". Skeels and Grudin (2009) do conclude that there is no evidence, or it is difficult to prove, that the use of the social Web in the workplace contributes to less productivity. There are other issues related to the use of Web 2.0 in the workplace. For example, although social networking tools allow users to have personal control over whom they want to connect and interact with, trust and privacy are a major concern for employees, as well as for employers (Acquisti and Gross 2006; Dwyer, Hiltz, and Passerini 2007).

Web 2.0-based workplace learning

As shown earlier, the use of Web 2.0 in the workplace has gained momentum, which offers opportunities for workplace learning. However, the question arises as to whether organisations have recognised and tapped the informal learning generated through the application of Web 2.0 technologies. Systematic research that focuses specifically on Web 2.0-based informal learning in the workplace remains novel and sparse (Chiu, Tsai, and Fan Chiang 2013; García-Peñalvo, Colomo-Palacios, and Lytras 2012). The recent study of Valencia-García *et al.* (2012) attempts to develop a semantic platform for companies and users to gather useful information and conduct expertise mining from social web content such as blog posts. Milovanović *et al.* (2012) investigate how to use Wiki as a tool for corporate exchange of knowledge through a case study of a software development company. The study finds that a Wiki did facilitate informal learning and was a useful informal tool for the employees in the company to share knowledge and learn from each other during the process of software development.

Littlejohn, Milligan, and Margaryan (2012), in their study on self-regulated learning (SRL), demonstrate improved effectiveness in work-based learning where knowledge was created in a global online social network. Similarly, Hart (2012) observes that many workers are using social networking tools to address their own learning and performance needs in the workplace. These workers share a great deal in common in terms of motivations and learning behaviour. They constantly strive to improve their productivity and solve workplace problems through asking questions, and sharing ideas with friends and colleagues in their online social networks. These studies provide empirical evidence on Web 2.0-based workplace learning.

However, to exploit the knowledge derived from informal learning, fundamental questions remain to be answered about how Web 2.0-based workplace learning happens, and how individual, social and organisational factors may positively influence that learning?

Theoretical basis and hypothesis development

To investigate the "how" questions, we draw on the relevant theories and research on social exchange, social capital, CoP and organisational support. We employ social exchange theory (SET) and social capital theory (SCT) to identify and study what are the key individual and social factors that may motivate workers to share and learn through Web 2.0 technologies.

SET is one of the most influential conceptual frameworks to understand workplace behaviour, although some of its concepts are considered vague and uncertain (Emerson 1976). While SET allows for the understanding of individual factors and motivations, SCT highlights the goodwill that people have towards others, which may drive people to contribute to Web 2.0-based informal learning. In this regard, SCT provides an extra lens through which to see the relationships between individual and social factors.

As shown in the previous section, Web 2.0-based workplace learning takes place in online social networks and is cultivated in online communities. We consider that the well-established CoP concept which views learning as a social process that occurs in CoP, enables us to explain, in a systematic way, how individual and social

factors affect Web 2.0-based workplace learning. As Web 2.0-based workplace learning is associated closely with organisations and organisational learning, it is imperative to study the effects of organisation on Web 2.0-based workplace learning. For that purpose, we draw on the extant research on the role of organisations in supporting Web 2.0-based workplace learning. The following sections present details about the theoretical bases and our hypotheses which are built on these theories.

SET − study of individual effect

SET originated in the late 1950s and early 1960s from research by Homans (1958), Thibaut and Kelley (1959) and Blau (1964). SET has become a distinctive approach in the study of sociology and social psychology (Emerson 1976). According to Blau (1964), social exchange occurs when self-interested actors interact with other self-interested actors to achieve personal goals which they cannot achieve by themselves. In this regard, self-interest and interdependence are central properties of social exchange. It is a mutually contingent and mutually rewarding process. Similarly, Thibaut and Kelley (1959) suggest that mutual reciprocity, in terms of rewards and costs, is a key driver for social exchange. As Emerson (1976, p. 336) noted after reviewing the main stream of SET, "the exchange approach in sociology might be described, for simplicity, as the economic analysis of noneconomic social situation." Indeed, SET brings a quasi-economic mode of analysis into informal social interactions.

As shown earlier, SET focuses on the study of motivation and behaviour of individuals in their interaction with others. SEC has been used to study the knowledge sharing behaviour of individuals in online communities (Kankanhalli, Tan, and Wei 2005; Tiwana and Bush 2001; Wasko and Faraj 2005). For example, in an empirical study of Wasko and Faraj (2005), it is found that people contribute and share their knowledge in electronic networks because they perceive that it will enhance their professional reputation. In other words, self-interest, as relevant to one's profession and workplace, is the main drive for contribution and sharing. The self-interest may be related to perceived benefits which could include advancement of professional reputation and status, social acceptance, recognition and respect. These perceived benefits may also apply in the context of Web 2.0-based workplace learning and propel people to share and gather information related to their profession and workplace. For example, the possibility of advancement in one's professional reputation and status may motivate people to capture, cultivate and build on, the collective experience in, and for, the workplace.

However, self-interest may go beyond the external rewards. It may be derived from intrinsic motivation, such as a sense of self-fulfilment. For example, employees who take up the challenge of using a new technology (i.e. Web 2.0) and/or voluntarily exchange professional information and knowledge on an SNS may feel self-fulfilled and/or derive satisfaction from helping colleagues to solve a work-related problem. Based on these assumptions, we formulate the following hypotheses:

Hypothesis 1: Self-interest will be positively associated with Web 2.0-based workplace learning.

Hypothesis 2: Self-fulfilment will be positively associated with Web 2.0-based workplace learning.

SCT – study of social and individual effects

In this section, we draw on SCT to study the effects of social and individual factors on Web 2.0-based workplace learning. The concept of social capital has been widely used in the disciplines of sociology, political science, economic development and business and management (Burt 2000; Prusak and Cohen 2001; Coleman 1988; Nahapiet and Ghoshal 1998; Putnam 1995; Woolcock 1998). After a thorough and comprehensive literature review of relevant research on social capital, Nahapiet and Ghoshal (1998, p. 243) define social capital as: the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. From this definition, Nahapiet and Ghoshal (1998) posit that social capital has three primary and distinctive dimensions: the structural dimension, relational dimension and cognitive dimension:

- The structural dimension refers to a network of connections that individuals perceive themselves belonging to.
- The relational dimension can be a sense of trust that must be developed across the network.
- The cognitive dimension requires that the members of the network share a common interest or a common understanding of issues facing the organisation.

Research has been undertaken to compare social capital with other forms of capital. Building on previous research, Adler and Kwon (2002, pp. 21–22) perceive that at the core of social capital lies the goodwill that people have towards others, which is regarded as a valuable resource. According to them, social capital shares some common features with other forms of capital but also differs, "like all other forms of capital, social capital is a long-lived asset into which other resources can be invested." Unlike financial capital, social capital that is generated from social bonds needs on-going "maintenance," as the social bonds need to be "periodically renewed and re-confirmed." This comparison clarifies further the concept of social capital. For example, self-fulfilment, through helping others, without expecting personal gains, can be also explained by SCT.

SCT has been widely used to study the effects and outcomes of a social network on its participants (Carpenter, Li, and Jiang 2012). Some researchers have applied SCT to explain knowledge sharing and information exchange in various networks and communities, both online and offline (Chiu, Hsu, and Wang 2006; Ganleya and Lampeb 2009; Wang and Chiang 2009). The study by Ganleya and Lampeb (2009) finds that visitors to Web 2.0 sites contribute voluntarily a greater portion of the value to the sites which then becomes social capital. Participants in the online community are often motivated and individually rewarded by creating such social capital. Wasko and Faraj (2005) find that people's contribution to online communities is associated with their perceived level of expertise. People are most likely to contribute when they feel that they have knowledge in the relevant area.

These studies provide a lens through which to reveal the motivation that drives knowledge sharing in online communities. However, empirical research is yet to be conducted to identify if, and how, social capital influences Web 2.0-based workplace learning. For example, people in the workplace may use *Facebook* to build rapport and strong working relationships, and to build social capital (Skeels and Grudin

2009). The Web 2.0-based interaction with others may involve and lead to learning through building such connections. We, therefore, make the following hypotheses based on the three dimensions of SCT.

Hypothesis 3: Sense of belonging will be positively associated with Web 2.0-based workplace learning. [Structural dimension]

Hypothesis 4: Trust of members within a community will be positively associated with Web 2.0-based workplace learning. [Relational dimension]

Hypothesis 5: Perceived expertise in the field will be positively associated with Web 2.0-based workplace learning. [Cognitive dimension]

CoP – the mediator

Influenced by social constructivism, Wenger, McDermott, and Snyder (2002) developed a social theory of learning which maintains that learning is a social process that occurs in CoP. There are three crucial elements that define a CoP as a place of learning: the domain, the community and the practice. A CoP should have an "identity defined by a shared domain of interest" (Wenger 2006, p. 1). Members in the community are inclined to commit to the community and have a shared competence that distinguishes them from others external to the community. The community supports member interaction and facilitates learning from each other.

The practice means that members have a shared practice within a CoP, for example, nurses may develop a shared repertoire of knowledge about patient care when they meet regularly for lunch in a hospital cafeteria (Wenger 2006). The collective learning can occur and take place everywhere (at home, at work/school, domestically or internationally), and online and offline. In contrast to learning as knowledge transmission from an instructor to a learner, the concept of CoP theorises the meaning and process of learning as part of social activity. A CoP enables socialisation of employees where experiences are shared and technical skills can be learned (Boateng, Mbarika, and Thomas 2010).

Research has been undertaken to examine the effect of a CoP on organisational learning and development. For example, Lesser and Storck (2001) study the relationship between a CoP and organisational performance from a social capital perspective. They view a community as an engine for the development of social capital, and assume that the social capital generated through knowledge sharing in a CoP contributes to behavioural change. That change helps enhance business performance. They empirically tested their assumption in seven organisations where a CoP was sponsored by the organisation and claimed to be creating value to the organisation. The study finds that the positive outcomes from a CoP are associated with basic dimensions of social capital – "connections among practitioners, relationships that build a sense of trust and mutual obligation, and a common language and context that can be shared by community members" (Lesser and Storck 2001, p. 831). This study provides empirical evidence to demonstrate that a CoP creates organisational value through knowledge sharing. However, it is limited in terms of what organisation and management can do to foster CoP.

Although literature is sparse, research on Web 2.0-based CoP is emerging. Based on their own experiment and CoP research, Gunawardena *et al.* (2009) developed a working framework to build a Web 2.0-based CoP utilising social networking tools. In the Web 2.0-based CoP, SNSs facilitate the formation of the domain. The domain is formed as Web 2.0 technologies present a forum for discussion and interaction,

and provide the common ground where members share their ideas, knowledge and stories. Social networking tools, such as wikis and blogs, can help to build the community through dialogue and conversation among participants who share the same interest. The practice is the specific knowledge the community develops, shares and maintains. Through participation in discussion and connection on the SNS, members with shared interests and practice learn from, adjust and influence, each other. That collaboration leads to the generation of new ideas and knowledge in their professional field.

This framework helps understand the CoP learning process that involves Web 2.0 technologies, and it identifies the crucial role of CoP in Web 2.0-based learning. However, the framework limits the context to "the site and the context of individuals using the site" and fails to consider the impact of the organisation on Web 2.0-based learning. We argue that since Web 2.0-based CoP takes place in the workplace, learning that occurs in the CoP will inevitably involve the organisation.

Drawing on the extant research on CoP, we conclude that (1) a CoP offers an important insight into the nature and process of learning associated with the workplace, where the central issue in learning is sharing knowledge that is valuable to organisations; (2) a CoP is a "shared domain of interest" and a place of learning; (3) learning and social activities can go beyond a CoP, and within or beyond the boundaries of a workplace; (4) a Web 2.0-based CoP facilitates learning that relates to the members of workplace; and (5) a CoP may help improve organisational development through knowledge sharing. Therefore, we posit that employees with shared interest in the workplace tend to form or join a CoP where they are more likely to contribute and share knowledge for various reasons such as self-interest, self-fulfilment, a sense of belonging, trust and perceived expertise. These kinds of activities, cultivated in a CoP, leads to workplace learning, and Web 2.0-based workplace learning, if Web 2.0 technology is used. In this process, a CoP becomes a crucial mediator through which individual and social factors may have an impact on the process and outcome of Web 2.0-based workplace learning. Thus, we make the following hypotheses:

Hypothesis 6a: Communities of practice will mediate individual effect on Web 2.0-based workplace learning.

Hypothesis 6b: Communities of practice will mediate social effect on Web 2.0-based workplace learning.

Organisational support – a moderator

According to the study conducted by Gartner (2012), the number of larger organisations that block employees' access to social media sites is dropping significantly, from 50% in 2011 to fewer than 30% by 2014. Hart (2012) also finds that some organisations have started to realise that social media has an important role to play to support employee collaboration and engagement, and thus have embarked on upgrading their system to allow for social functionality.

One important aspect of organisational support is to understand "processes and tools", including Web 2.0 processes and technological tools (Boateng, Mbarika, and Thomas 2010, p. 20). The purchase and maintenance of Web 2.0 applications is an indication of the organisational support. For example, developing and maintaining a virtual CoP (a shared work area) would enable employees to collaborate and publish. It is of interest to note that a survey conducted by McKinsey finds that 75%

of executives are positive that investment in Web 2.0 tools would foster desired behaviour such as collaboration (Schneckenberg 2009). As organisations are primarily about people, and learning is basically about people, the study of Chatti *et al.* (2007) maintains that organisational support should move from a technology-driven focus to a focus on support for employees. Therefore, training of employees in the use of Web 2.0 tools is needed.

Organisational support for new resourcing is then more concentrated on the people than on technology as a resource. Built on the concept of digital steward-ship of Wenger, White, and Smith (2009), Cochrane (2010) illustrates the role of an organisation as being a ''digital steward'' in a CoP, in replacement of the traditional, and basic, information technology only support. Digital stewardship is an inside out model because organisational support is commanded from within, in contrast to a top-down resourcing of technology tools by an organisation.

The study of Lyle (2012, p. 219) finds that organisational support of Web 2.0 technology contributes to a learning organisation, where there is a cultural change towards learning as ''the prime purpose of business''. Wang (2011) argues that it is essential to align individual learning needs, organisational objectives and social networking in developing a Web 2.0 workplace e-learning environment. Carpenter, Li, and Jiang (2012) consider that employees are the creators and receivers of workplace learning, while the organisation grows as a learning organisation through knowledge sharing among employees, and management of that learning by the organisation. The study by Boateng, Mbarika, and Thomas (2010, p. 17) also demonstrates that organisations ''learn and create knowledge through dynamic interactions between employees''.

These studies suggest that there is an inherent relationship between workplace learning and a learning organisation. It is apparent that organisations can play a key role in Web 2.0-based workplace learning in terms of provision of Web 2.0 technology, training, hosting a CoP and fostering a learning culture. Meanwhile, organisations are assumed to benefit from Web 2.0 workplace learning which leads to organisational learning (Carpenter, Li, and Jiang 2012). Therefore, we posit that organisational support is an important moderator which encourages motivated employees to learn and contribute to Web 2.0-based workplace learning. In that regard, our hypotheses are:

Hypothesis 7a: Organisational support will moderate individual effect on Web 2.0-based workplace learning.

Hypothesis 7b: Organisational support will moderate social effect on Web 2.0-based workplace learning.

Future research

Based on the seven hypotheses, we develop a theoretical model for a systematic study of individual, social and organisational effects on Web 2.0-based workplace learning, as shown in Figure 1.

The model illustrates the hypothesised causality between independent and dependent variables (see H_1–H_5). It also specifies the hypothesised mediating effect of a CoP (see H_6) and moderating effect (see H_7) of organisational support on the causality (i.e. in H_1–H_5). In other words, we hypothesise that a CoP is so crucial to the hypothesised causalities in H_1–H_5 that without it, the hypothesised causalities will not exist. Although organisational support is important, because it can affect
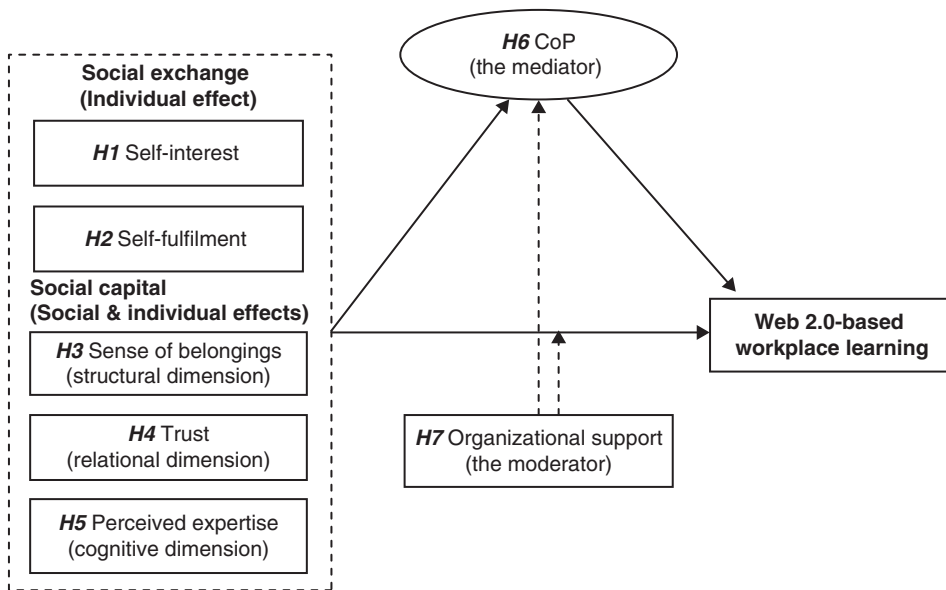
Figure 1. Theoretical model for study of individual, social and organisational effects on Web 2.0-based workplace learning.

positively the hypothesised causalities (i.e. in H_1–H_5), Web 2.0-based informal learning in the workplace happens with or without organisational support. Therefore, we view organisational support as a moderating variable according to the classification of variables by Baron and Kenny (1986).

We suggest that a quantitative questionnaire survey be conducted either online or by mail to collect empirical data. To help develop the questionnaire survey for empirical testing, we operationalise all the variables of our hypotheses as follows and summarise them in Table 1.

Variables and measurement

Dependent variable

We hypothesise Web 2.0-based workplace learning as the dependent variable which may be measured in various ways. For example, we can quantify the variable by measuring the knowledge gained, and shared informally, using Web 2.0 platforms that are relevant to jobs and duties, and to the whole workplace. The improvement in job performance, through such knowledge exchange and learning, can be another measure of the dependent variable.

Independent variables

As shown in Table 1, five independent variables are proposed in relation to Web 2.0-based workplace learning. *Self-interest* may be measured by perceived benefits from participating in Web 2.0-based workplace learning, such as a boost in reputation, respect, status, social acceptance and recognition. *Self-fulfilment* is driven largely by intrinsic motivations which may be measured by the level of aspiration to take up new challenges and help others. *Sense of belonging* may be measured by how much

Table 1.   A summary of hypotheses, theoretical bases and operational variables for future empirical testing.

Hypothesis	Theoretical basis	Effect grouping	DV*	IV*
H$_1$: Self-interest will be positively associated with Web 2.0-based workplace learning.	Social exchange theory Homans (1958), Thibaut and Kelley (1959), Blau (1964)	Individual	Web 2.0-based workplace learning • Amount and quality of knowledge gained and shared • Other outputs from such learning	Self-interest • Perceived benefits – boost of reputation, respect, status, social acceptance, social recognition, and so on
H$_2$: Self-fulfilment will be positively associated with Web 2.0-based workplace learning.	Social exchange and social capital theories Nahapiet and Ghoshal (1998) Adler and Kwon (2002), and so on	Individual	As earlier	Self-fulfilment • Intrinsic motivations – taking up new challenges, helping others, and so on
H$_3$: Sense of belonging will be positively associated with Web 2.0-based workplace learning.	Structural dimension of social capital Nahapiet and Ghoshal (1998)	Individual and social	As earlier	Sense of belonging • Viewing oneself a central part of a community and therefore, willing or obliged to contribute to it
H$_4$: Trust of members of community will be positively associated with Web 2.0-based workplace learning.	Relational dimension of social capital: Nahapiet and Ghoshal (1998) Coleman (1988)	Social	As earlier	Trust • Trust of other members when sharing information and knowledge
H$_5$: Perceived expertise in the field will be positively associated with Web 2.0-based workplace learning.	Cognitive dimension of social capital Nahapiet and Ghoshal (1998) Wasko and Faraj (2005)	Social	As earlier	Perceived expertise • Mastery of specialised discourse, norms of the practice, and so on • Hands-on experience
Hypothesis H$_6$: CoP will mediate individual and social effects on Web 2.0-based workplace learning.	Theoretical basis CoP Wenger (2006), Lesser and Storck (2001), Gunawardena *et al.* (2009)	Effect grouping Social	DV and IV Web 2.0-based workplace learning and self-interest, self-fulfilment, sense of belonging, trust of members, perceived expertise	MeV* CoP • Level of involvement with CoP
Hypothesis H$_7$: Organisational support will moderate individual and social effects on Web 2.0-based workplace learning.	Theoretical basis Organisational learning and development Boateng, Mbarika, and Thomas (2010), Carpenter Li, and Jiang (2012)	Effect grouping Organisational	DV and IV Web 2.0-based workplace learning and self-interest, self-fulfilment, sense of belonging, trust of members, perceived expertise	MoV* Organisational support • Investment in Web 2.0 • Staff training • Fostering learning culture, and so on

*Note: DV, dependent variable; IV, independent variable; MeV, mediating variable; MoV, moderating variable.

one views oneself as part of a team or community and is willing to contribute to it. *Trust*, as a relational dimension of social capital, may be measured by the extent of trust one has towards other members of a network in deciding to share knowledge with them. *Perceived expertise* may be measured by one's perception of the extent of mastery in specialised knowledge and practices.

Mediating and moderating variables

The mediating variable of a CoP may be measured by the level of involvement with a CoP in terms of the formation of, and participation in, a CoP. Organisational support, as a moderator, may be measured in terms of the level of investment in Web 2.0 technologies, hosting a CoP, providing on-going technical support and training, as well as taking initiatives in nurturing an organisational learning culture.

Conclusion

Social networking tools have been widely used for different purposes in the workplace, and have been a subject of controversy and debate (Hasan and Pfaff 2006; Skeels and Grudi 2009). Nevertheless, Web 2.0 is not only a technological revolution, but also a social revolution. Informal learning through connection and collaboration on the various platforms of Web 2.0 is happening and growing in the workplace, with or without it being formally recognised or sanctioned (Zhao and Kemp 2012). Our study has contributed to the body of knowledge on informal learning by proposing a theoretical model for a systematic study of individual, social and organisational effects on Web 2.0-based workplace learning.

The integration of informal and formal learning, as mediated by Web 2.0 technology, is of substantial interest to employers and researchers for its effect on organisational learning and development. More systematic research is required to understand Web 2.0-based learning in the workplace.

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