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Understanding the effect of e-learning on individual performance: The role of digital literacy

Soheila Mohammadyari, Harminder Singh*

Faculty of Business & Law, Auckland University of Technology, Auckland, New Zealand

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ABSTRACT

With the diffusion of easy-to-use Web 2.0 tools, such as podcasts, blogs and wikis, e-learning has become a popular mechanism for individual training. While individuals use these tools in the hope that their training will improve their performance, this relationship is not a given. This paper proposes that an individual's level of digital literacy affects her performance through its impact on her performance and effort expectations. To explain the influence of digital literacy on the intention of individuals to continue using e-learning and their performance, we integrate the concept of digital literacy with the Unified Theory of Acceptance and Use of Technology (UTAUT) and test our model using survey data from New Zealand accountants working in small and medium-sized enterprises (SMEs). The results indicate that these relationships were significant: digital literacy on users' performance and effort expectations, performance expectations on users' intentions to continue using Web 2.0 tools, and continuance intention on performance. These findings suggest that individual digital literacy facilitates the use of e-learning, and should be considered when examining the impact of the latter on performance.

1. Introduction

E-learning, especially in the form of web-based technologies, is increasingly being used by organizations to train their employees (Wang, Ran, Liao, & Yang, 2010), because it lowers the cost of delivering training, increases the flexibility of learning in terms of place and time, encourages the self-management of learning, and enables on-demand training (Admiraal & Lockhorst, 2009; Jutla, Bodorik, & Dhaliwal, 2002; Salas, Kosarzycki, Burke, Fiore, & Stone, 2002; Wang, 2011). These advantages mean that e-learning now accounts for about a third of the US$200 billion global corporate training industry (Rayson, 2013).

At an organizational level, the use of technology for workplace learning can help resolve budget and scale issues. The benefits of e-learning largely revolve around convenience, because learning can take place at a distance and at a time and pace suited to learners' needs (Welsh, Wanberg, Brown, & Simmering, 2003). This is advantageous for large organizations, who have many employees working in various locations across a range of work processes, which require communication and collaboration. For small and medium-sized enterprises (SMEs), which have fewer employees and operate in fewer locations, the advantages of e-learning are the enhanced flexibility and the access to expertise that is not available locally (Park & Wentling, 2007; Sambrook, 2003). However, the acceptance of e-learning in SMEs is still problematic, with the reasons including limited technology budgets and a skeptical attitude borne out of the perception that e-learning is largely non-interactive learning that does not meet their learners' needs (Sambrook, 2003; Welsh et al., 2003).

However, while e-learning has become more widely accepted, its effectiveness is not assured. For example, there can be misalignments between the practice of technology-supported learning and organizational norms in areas such as knowledge sharing (He & Wei, 2009). E-learning at workplaces can also be less effective if it is not clearly related to business and performance requirements, and if little job analysis was carried out before it was adopted (Vaughan & MacVicar, 2004). These obstacles can decrease employee motivation and learning and transfer effectiveness. Thus, to make workplace e-learning more effective, job competencies and performance requirements should be aligned with the norms and practices embodied in e-learning (Wang, 2011).

* Corresponding author. Tel.: +64 9921 9999x5029.
E-mail address: hsingh@aut.ac.nz (H. Singh).

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E-learning's effectiveness also depends on the level of individual and social support available when it is being adopted (Cho, Cheng, & Lai, 2009; Liu, Chen, Sun, Wible, & Kuo, 2010). The ability to collaborate with remotely-located peers may address learners' social needs and make them more satisfied with online learning and motivated to use it (Salas et al., 2002). Learners may also be more satisfied and keen to continue their learning if they are able to control and customize their learning, as their learning experiences will then be a better fit with their preferences (Derouin, Fritzsche, & Salas, 2005).

Although there is substantial research on the impact of workplace e-learning, little work has examined professionals' perceptions of, and reactions toward, this technology-delivered pedagogical innovation (Chiu & Wang, 2008). This is a significant gap because a lack of consideration for learners' perceptions and attitudes toward workplace e-learning can impede the use of e-learning applications (Admiraal & Lockhorst, 2009; Brown, Murphy, & Wade, 2006; Servage, 2005; Vaughan & MacVicar, 2004).

Thus, it is important to understand the role of individual attitudes toward technology, since e-learning usage depends on it. As new generations of e-learning technology, such as podcasts, wikis and blogs, enter workplaces, being able to quickly adopt and use them for one's training becomes a valuable skill because it means greater control over one's learning environment-individuals can try different tools, and pick and choose which ones fit their needs and preferences best. Individuals who, on the other hand, are less able to adopt new tools may be stuck with e-learning from the previous generations which may be less customizable, less portable, and difficult to query, making their e-learning experience less enjoyable. Individuals who are better able to adopt new tools may start using them if the new tools fit their learning styles or preferences better, while those who find it difficult to adopt new systems may be trapped into using systems that they do not like (Ahmed, 2010).

The constant shift in and upgrading of e-learning technology highlights the value of exploring the impact of individuals' digital literacy on the adoption of e-learning in the workplace. Digital literacy comprises more than the abilities to use software or use a digital device; it involves a large variety of complex cognitive, emotional and sociological skills, which users need to function effectively in digital environments (Martin & Madigan, 2006). Digital literacy is a broader concept that integrates several skill-sets and related literacies, such as information evaluation and knowledge gathering (Virkus, 2003). Updating these abilities will be necessary, as people's circumstances change and as changes in the digital information environment bring about the need for new understandings and abilities (Markless & Streatfield, 2007). While a basic level of digital literacy would include the ability to send e-mails, prepare documents using computers, and search for information on the Web, the competencies required to fulfill this fundamental level of digital literacy increase as the use of technology, particularly mobile technology, expands. Thus, being digitally literate today arguably includes skills such as being able to use messaging applications on smartphones and create digital artefacts using applications such as WordPress and Twitter.

The broader set of skills required to be competent at e-learning is an overlooked issue in research, and this study's first contribution is that it addresses this gap by introducing digital literacy to the Unified Theory of Acceptance and Use of Technology (UTAUT). The study's second contribution is to clarify the impact of e-learning on individuals. This objective was motivated by contradictory and inconclusive reports about the consequences of using e-learning found in prior studies on this topic (e.g. Cheng, 2011).

The next section provides the background to the study, before presenting the research model and the hypotheses to be tested. Following the discussion of the methodology and results, the paper concludes with implications for practice and research, and possible directions for future research in this area.

2. Theoretical background

2.1. E-learning

An e-learning system is a web-based communication platform that allows learners, without limitations on place and time, to access diverse learning tools, such as discussion boards, assessments, content repositories, and document sharing systems (Martins & Kellermanns, 2004; Ngai, Poon, & Chan, 2007). By themselves, traditional training methods are no longer able to satisfy the demands for continuous employee development and re-skilling (Roca & Gagné, 2008). E-learning makes learning more accessible because, not only can individuals study when it is convenient for them, but they also have access to coaching and support potentially round-the-clock. This means that it is possible to provide an experience more similar to a classroom, with experts tutoring learners located anywhere in the world (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004). E-learning is quickly becoming a vital part of the learning and teaching process (Pituch & Lee, 2006) because it makes communication among learners and between learners and instructors/teachers more efficient (Martins & Kellermanns, 2004). It also helps organizations increase the geographical reach of their training resources and complement face-to-face training activities.

These benefits mean that encouraging the use of e-learning is important for organizations, in particular SMEs. A basic way to increase use of a system is to enhance user acceptance of it (Ong, Lai, & Wang, 2004). Prior research has recognized that the perceived usefulness (PU) of systems is critical for gaining acceptance of new technologies among users (Bhattacherjee, 2001). Studies on e-learning acceptance (Liu et al., 2010) have confirmed that this factor is relevant in the e-learning context also. PU is influenced by individual differences in cognitive style and gender, and external factors, such as the availability of support, system characteristics, and the social context in which technology adoption takes place (Lu, Yu, Liu, & Yao, 2003). In the e-learning context, researchers have similarly studied predictors such as encouragement by peers, the extent of technical support, computer efficacy and experience, and various system attributes (Ngai et al., 2007; Ong et al., 2004; Pituch & Lee, 2006).

We extend the current body of knowledge in e-learning acceptance by investigating the role of digital literacy. Digital literacy is the ability to access, search, evaluate, modify and distribute digital media, and develop skills in the use of new technologies (Ng, 2012). It is related to an individual's inclination toward technology, and has both technical (possessing the abilities to use technologies) and cognitive (having the judgment to make appropriate choices when manipulating and gathering information) aspects. Digital literacy is an important determinant to consider as the number of e-learning tools has expanded in the recent past to incorporate Web 2.0 innovations, such as blogs, podcasts, wikis and RSS feeds. The rapid spread of these tools has meant that individuals often have had to train themselves in how to use these tools, instead of relying on infrequent corporate training sessions (Ullrich et al. 2008). Individuals with a high level of digital literacy have been better able to leverage these new tools to self-manage their training and carry out their continuing education activities in an informal setting, reducing the disruption to their working lives (Hargittai, 2010).

Conversely, individuals who are less "IT-savvy" have been less able to use these new tools to enhance their professional knowledge and skills. A key motivator behind the growing use of these tools has been the ability to quickly incorporate material about new developments in a field into training material, which is especially important for fields which are highly-regulated, operate in dynamic environments, or are significantly affected by technology-related issues, such as privacy or standards (Arbaugh & Duray, 2002). Insights into the role and importance of digital literacy will help managers of educational programs understand differences between individual users in their levels of e-learning acceptance and use.

2.2. E-learning and job performance

One of the major developments in organizational IT usage in the last decade has been the adoption of e-learning to support employee training (Hsbollah & Idris, 2009; Johnson, Hornik, & Salas, 2008). A key aspect of employee training is to enhance employees' access to knowledge, which is often scattered across an organization, since it is positively associated with employees' in-role job performance. Given that one of the main roles of e-learning is to consolidate and distribute work-relevant knowledge, it is likely that e-learning use is positively related to job performance (Ali-Hassan, Nevo, Kim, & Perelgut, 2011). Another benefit of e-learning compared to traditional training is that e-learning can cater to different learning styles by providing multiple paths of learning. Since organizations that align their employees' preferences with their e-learning strategies are more likely to increasing employee satisfaction with e-learning as well as enhance their learning (Little, 2001), it is likely that e-learning use is associated with improved job performance.

Despite the importance of understanding the impact of e-learning on users, this issue has received little attention from researchers. Most studies on e-learning have focused on understanding the factors that support the acceptance of e-learning (Ong et al., 2004) or the relationship between e-learning acceptance and its impact on organizations (Goh, Elliott, & Quon, 2012; Johnson et al., 2008; Roca & Gagné, 2008). At the individual level of analysis, only some researchers have investigated the impact of e-learning acceptance on the individual user (Ahmed, 2010), while most studies have examined user satisfaction with e-learning (Arbaugh & Duray, 2002; Eom & Arbaugh, 2011; Ho & Kuo, 2010; Kanuka & Nocente, 2003; Liaw, 2008; Lu & Chiou, 2010; Sun, Tsai, Finger, Chen, & Yeh, 2008; Wise, Chang, Duffy, & Valle, 2004; Zhang, Zhao, Zhou, & Nunamaker, 2004). Although such studies have been valuable in identifying the broad nature and domains of the impact of e-learning on individuals, they contain many contradictory and inconclusive reports about the consequences of its acceptance (e.g. Cheng, 2011). Thus, one of the goals of this study is to examine the relationship between e-learning acceptance and its impact on individual performance.

2.3. E-learning acceptance

The unified theory of acceptance and use of technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003) integrates constructs from the technology acceptance model (TAM) and the theory of planned behavior (TPB). UTAUT suggests that effort expectancy (EE) influences users' acceptance of a technology, and that perceived ease of use (PEOU) becomes less important over time as users engage with that technology for a sustained period of time. Thus, PEOU is expected to be salient only in the early stages of using IT (Venkatesh et al. 2003).

UTAUT also endeavored to explain how individual differences can influence IT use by proposing that the relationships between PEOU, perceived usefulness (PU), and IT use can be moderated by gender, age, experience, and voluntariness of use. For instance, Venkatesh et al. (2003) found that the relationship between IT use and PU varied with gender and age-it was stronger for males and younger employees. The impact of PEOU on usage intentions was also moderated by age and gender, such that it was stronger for older persons and female employees. The UTAUT model was able to explain 70 percent of the variance in IT use (Venkatesh et al., 2003), and to do so with greater clarity than the TAM model. Thus, UTAUT has been used to examine users' acceptance of various technologies (Abu Shanab & Pearson, 2007; AlAwadhi & Morris, 2008; Baltaci-Goktalay & Ozdilek, 2010).

In the e-learning literature, UTAUT has been used to investigate the intention of learners to use and continue using e-learning (Chiu & Wang, 2008; Wang & Shih, 2009). In contrast to studies on e-learning acceptance by students, theory-driven empirical studies on e-learning acceptance by professionals in workplace contexts are comparatively rare (Roca & Gagné, 2008). Given the ability of UTAUT to explicate behavioral intentions to accept new technologies in diverse situations (King & He, 2006; Sun & Zhang, 2006), it is adopted as the guiding framework of this study.

We adapt this model by introducing the concept of digital literacy to incorporate a key defining characteristic of our study. The study takes place in a context where the IT that has been introduced requires users to learn a new set of skills before they can use it to enhance their performance. E-learning traditionally meant individuals in corporations going through well-structured material encapsulated in clearly-defined software packages running on personal computers in offices. Today, e-learning can involve employees accessing content in various forms and formats, over various types of devices that may be owned by themselves or their organizations, and organizing their own learning themselves.

Thus, over and beyond the traditional determinants of IT use as described in the UTAUT model, an individual ability's to maneuver across these new tools-finding and accessing them, trying them out, discarding those that do not fit their needs and learning styles and keeping those that do-is critical for understanding their impact on individual performance and use. The predictors in the UTAUT model-perceived usefulness, perceived ease of use, effort expectancy and performance expectancy-are related to an openness to new technologies. Using e-learning productively today means that, alongside a willingness to learn technical skills, users need to find sources of information, manipulate and critique them, and interact with peers located remotely who they may possibly not have met before in a search for relevant knowledge. This combination of technical and cognitive skills required to be competent at e-learning is overlooked in research, and to address this gap, we introduce digital literacy to the UTAUT model.

2.4. Digital literacy

Having access is not enough to ensure that technology will enable individuals to achieve sought-after socio-economic goals, since certain foundational skills are needed for IT to be effectively used (Buckingham, 2010). These digital competencies involve the "critical and

confident use of IS (information systems), including: an ability to participate in social networking applications and in collaborative environments, an awareness of security threats and risks, and also an ability to use IS for creative and innovative purposes, irrespective of the context (social, business, etc.)" (p. 61: Buckingham, 2010).

In this paper, digital literacy refers to the variety of literacies associated with the use of digital/new technologies. These technologies comprise software and hardware used by professionals for social and/or learning purposes at work. They include mobile devices (e.g. tablets, laptops, mobile phones, notebooks, and smartphones), desktop computers, data logging equipment, interactive whiteboards, digital recording devices (e.g. cameras, video and voice recorder), Web 2.0 tools and other resources on the Internet. The latter comprise multimedia and information resources (e.g. Wikipedia), collaborative and communication resources, such as Moodle, Skype, blogs, wikis, concept-mapping technologies, such as SpicyNodes, storage spaces, such as Sky Drive and Dropbox, and learning applications that are either commercially sold or freely available from the Web.

The term "digital literacy" has been used since the 1980s, but in a narrower sense of being able to use computers for one's work. Gilster (1997) expanded the concept and described it as "… the set of attitudes, understanding and skills to handle and communicate information and knowledge effectively, in a variety of media and formats" (p. 17). Gilster's idea was broader, and was not constrained to a list of particular skills, attitudes, or competencies defining what it is to be digitally literate (Gilster, 1997). Thus, it is the modern form of the traditional idea of literacy-embodying the abilities to write, read and deal with information using the different formats of technology.

Digital literacy is seen as a combination of cultural, cognitive and technical resources, as shown in this definition from the British educational research organization, Futurelab:

> To be digitally literate is to have access to a broad range of practices and cultural resources that you are able to apply to digital tools. It is the ability to make and share meaning in different modes and formats; to create, collaborate and communicate effectively and to understand how and when digital technologies can best be used to support these processes. (p.2: Hague & Payton, 2010)

The European Information Society has a similarly broad view of digital literacy:

> Digital literacy is the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyze and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process. (Martin, 2005, p. 135)

The above-mentioned definitions highlight the individuals' ability to create meanings and communicate effectively with one another through digital technologies, with the latter definition emphasizing more unambiguously the ability to search, evaluate and create using digital resources.

Besides the technical awareness, digital literacy includes the social and cognitive skills required in the digital environment (Huerta & Sandoval-Almazán, 2007). Eshet-Alkalai's (2004) digital literacy framework specifies five skills: photo-visual skills, reproduction skills, branching skills, information skills, and socio-emotional skills. Taken together, these five skills enable individuals to navigate and find qualified web-based information, and synthesize, understand and analyze it to create an original piece of work. The set of skills indicate that digital literacy is more than simply searching for and recognizing different forms of representation. It also encompasses the ability to "vet and integrate that information while monitoring (one's) progress toward learning goals" (pg. 56: Greene, Yu, & Copeland, 2014).

Ng's (2012) framework draws together all of these definitions and groups them into three dimensions: technical, cognitive, and social-emotional. Based on these dimensions, digitally literate individuals should possess the technical and operational skills, the ability to think critically and evaluate digital information, and be able to use the Web/internet responsibly to communicate using ICT for learning, work and other everyday activities.

In summary, being digitally literate requires the development of a set of key socio-emotional, cognitive, and technical skills. A digitally literate individual should be able to operate different types of computers and access resources; search, find, and evaluate information effectively for learning purposes; select and develop skills in the use of the technological tools to accomplish tasks; solve problems; act appropriately in online communities; and keep oneself away from harm in digital environments.

Digital literacy is arguably a fundamental life skill in today's knowledge economy and information society (Bawden, 2001; Markless & Streatfield, 2007; Martin & Madigan, 2006). The present study extends UTAUT by including digital literacy as a key predictor of the continued use of e-learning. Digital literacy is particularly relevant in the context of e-learning use because it allows us to conceptualize IT use as an evolving skill. In other words, users who are more comfortable with IT are more likely to take up e-learning innovations and persist with them much more easily than users who are less savvy with IT. Digital literacy is especially important in the context of e-learning in small and medium-sized enterprises (SMEs). E-learning is beneficial for SMEs because they have inadequate funds to hire trainers and facilitators, limited space they can set aside for learning areas, and constraints in which employees they can afford to send to training (Floyde, Lawson, Shalloe, Eastgate, & D'Cruz, 2013). Employees who are digitally literate will be better able to make use of the time allocated to them for e-learning because they will be able to examine evaluate knowledge in different forums, and be aware of the cultural norms around requesting and obtaining information they need. The proliferation of learning in a variety Web 2.0-based channels will not intimidate them, as they will know how to access them in the most convenient and efficient way, share relevant knowledge with their colleagues, and perhaps even create new learning artefacts to be shared with their community. In these ways, the level of digital literacy among employees of an SME will have a positive impact on the value that the SME obtains from its investments in e-learning.

The advent of a knowledge-based society, where economic wealth depends on individuals' ability to deal with the abundance of information and to adapt to an ever-changing working environment, makes digital literacy a particularly salient concept for examining individual adoption of IT. Unlike computer self-efficacy (Compeau & Higgins, 1995), which is based on individuals' perceptions of their own skills, digital literacy also includes their awareness of important IT-related terms and norms, and is thus a more direct measure of their IT-related abilities (Hargittai, 2005).

In this section, we discussed the current state of research regarding e-learning, its acceptance, and its impact on individual performance. The UTAUT model was chosen as the overall framework for this study, since it has been shown to be robust after being tested in a wide variety of contexts. We then made our case for including digital literacy as an additional predictor in the model, basing it on developments in the field of e-learning and what they implied for individual users. In the next section, we present the research model and the hypotheses.

3. Research model and hypotheses

Fig. 1 below depicts our research model. We adapted UTAUT by including digital literacy (DL) as an additional predictor of an individual's intention to continue using e-learning, in addition to the three core constructs of UTAUT-performance expectancy (PE), effort expectancy (EE) and social influence (SI). In addition, we divide SI into two separate constructs dealing with the influence of key individuals (ISI) and organizational support (OS). Finally, instead of "use of IT" or "intent to use IT", the proximal predictor of performance in our model is "intent to continue using IT" (CI). The following paragraphs detail our reasons for these changes, and explicate the hypotheses in the model.

3.1. Digital literacy

Digital literacy (DL) is the ability to understand, analyze, assess, organize and evaluate information using digital technologies. Being digitally literate means knowing about various technologies and understanding how to use them, as well as having an awareness of their impact on individuals and societies. Digital literacy empowers individuals to communicate with others, work more effectively, and increase one's productivity, particularly with those who have the same skills and proficiency levels (Martin, 2008). Digital literacy has been to found to lower stress levels and reduce individuals' inclination to regard their achievements disparagingly (Eastin & LaRose, 2000), which should make them more confident about their expected performance.

In the e-learning context, individuals with low levels of digital literacy are less likely to continue using web-based learning (Ferro, Helbig, & Gil-Garcia, 2011). In contrast, individuals with a high level of digital literacy should be confident that their use of e-learning will enhance their performance, because they will find it easier to access and evaluate the systems, and tailor it to match their learning requirements and priorities. A high level of digital literacy will also make the act of using e-learning less burdensome cognitively because digitally-literate individuals will be familiar with the interfaces, access options, terminology and norms of new tools. Therefore, we propose:

H1 *Digital literacy has a positive effect on performance expectancy*
H2 *Digital literacy has a positive effect on effort expectancy*

3.2. Social influence

Social influence (SI) refers to the degree to which individuals perceives that important others believe they should use a particular system (Venkatesh et al., 2003). SI is similar to the concept of subjective norm in the TPB model, which argues that the more favorable the subjective norms of a specific behavior, the stronger would be users' intention to perform it (Li & Kishore, 2006). Studies show that subjective norms are an important predictor of the intent to use an application (Eckhardt, Laumer, & Weitzel, 2009; Hsu & Lin, 2008; Payne, 2008).

In the traditional UTAUT model, SI is assessed as a four-item construct that affects an individual's intention to continue using a technology. In the context of this study, we make two changes relating to the SI construct. First, we separate it into two sub-constructs. The first two items (denoted as ISI in our model, which stands for Individual Social Influence) refer to the perceived influence of key individuals, while the second set of items (OS or Organization Support) refers to the perceived influence of the organization that individuals work for.

Second, in the UTAUT model, SI is a predictor of an individual's intention to continue using a particular technology. In our model, we retain this relationship for OS, but argue that ISI influences an individual's performance and effort expectancies. Our logic for these linkages rests on the view of IT use as a social activity (Lamb & Kling, 2003). Individuals use their technologies while being a part of one or more social networks, and in such networks, the actions of peers and other salient others influence individuals' conception of the value of a technology (Fulk, 1993; Lu, Yao, & Yu, 2005). Individuals often rely on their peers for assistance when they are using new technologies, lowering the level of personal effort required to become skilled users (Eckhardt et al., 2009). For example, they could ask their friends to help them download podcasts on a regular schedule, or edit a wiki on a professional topic of interest.

In addition, individuals observe how others who are connected to them professionally or socially use similar types of IT (Lewis, Agarwal, & Sambamurthy, 2003; Rogers, 2003), and the impact of their success at using these technologies on their work performance. This provides them with an opportunity to validate the technology's work-related value (Hsu & Lin, 2008). From an e-learning perspective, individuals

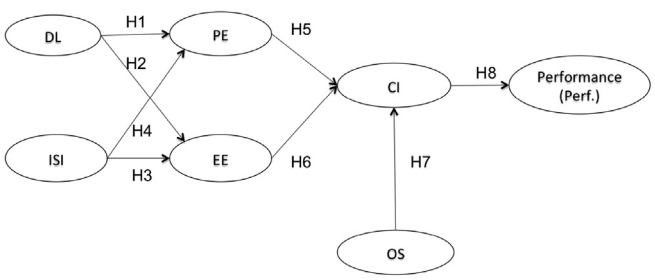

Fig. 1. Research model.

encountering new e-learning tools, such as podcasts or blogs, will be more likely to appreciate their relevance to their professional development if they see their colleagues and friends do better at their jobs and careers after using these tools. Therefore, we propose that:

H3 *Interpersonal social influence has a positive effect on effort expectancy*
H4 *Interpersonal social influence has a positive effect on performance expectancy*

In contrast to the influence of salient individuals, organizations affect an individual's decision to continue using a particular technology more directly. They do so through the extent to which they provide adequate resources, such as training, positive feedback, setting goals, and policy incentives, to help employees achieve organizational goals and reinforce the use of the technology (Joo, Lim, & Park, 2011; Lee, Hsieh, & Ma, 2011). The provision of such assistance may persuade employees that e-learning will lead to beneficial outcomes (Cheng, Wang, Moormann, Olaniran, & Chen, 2012). The relationship between organizational support and the perceived usefulness of using a technology has been shown in prior research (e.g. Igbaria, Zinatelli, Cragg, & Cavaye, 1997; Wang, Lin, & Luarn, 2006). Hence, we posit that:

H7 *Organizational support has a positive effect on e-learning continuance intention*

3.3. Performance expectancy

Performance expectancy (PE) is the extent to which users believe that a system enhances their performance (Venkatesh et al., 2003). Venkatesh et al. (2003) found that PE was a strong indicator of an individual's intention to use new technologies in an organizational context, and prior studies found a positive relationship between performance expectancy and continuance intention (e.g. Chiu & Wang, 2008; Chou, Min, Chang, & Lin, 2010). In this study, performance expectancy refers to the extent that individuals believe that continued use of e-learning will enhance their performance. It is important to note that these anticipated performance improvements may occur over a variety of time periods, depending on the specificity and direct relevance of the subject matter. At one extreme, e-learning can take the form of detailed “how-to” guides for new tools that are immediately applicable for performing a task. At the other end of the scale, e-learning is also used to impart useful, abstract information on issues such as new regulations or economic or social trends. Since individuals undertake training across many or all of these domains, the performance improvements they expect to occur will be staggered over time. The near-term improvements in performance they observe after carrying out e-learning would arguably deepen their belief that extended use of this technology would enhance their performance over the long-term, possibly leading to a feedback loop. Thus, we propose that:

H5 *Performance expectancy has a positive effect on e-learning continuance intention*

3.4. Effort expectancy

Effort expectancy (EE) is the extent to which users believe that using an application is free of effort (Venkatesh et al., 2003). In the context of this study, EE refers to the extent to which professionals believe that their continued use of e-learning is free of effort. If a system is relatively easy to use, individuals will be more willing to learn about its features so as to use more of them intensively, and adapt their work practices to fit its norms (Abu Shanab & Pearson, 2007). EE is related to the perceived ease of use construct in the TAM model, which argues that an application that is perceived to be easier to use is more likely to encourage a perception of usefulness, and thus engender the intention to use it (Saade & Bahli, 2005). Studies indicate that PEOU is positively associated with behavioral intention in the context of e-learning and technology acceptance (Ong et al., 2004; Saade & Bahli, 2005). Therefore, it is hypothesized:

H6 *Effort expectancy has a positive effect on e-learning continuance intention*

3.5. Continuance intention

The intention to continue (CI) using a particular e-learning technology does not reflect perceptions about that technology, but instead a belief that extended use of it will lead to valued outcomes, such as career progress and task performance (Wang, et al., 2010), and not place a significant cognitive burden on individuals when they use it. Going beyond acceptance, continued use suggests that individuals will have routinized the use of a particular technology and infused it into their work processes (Saga & Zmud, 1994). Once individuals have used a particular technology, their intention to continue using it reflects a willingness to maintain their dependence on that particular technology. This dependence is driven by their knowledge that the technology fits well with their work tasks, and will thus improve their performance (Goodhue & Thompson, 1995). The more frequently a technology is used, the better it meets the characteristics of the work and task, leading to a higher probability that the technology will improve job performance (Goodhue, Klein, & March, 2000; Jarvenpaa, Tractinsky, & Saarinen, 1999; Little, 2001; Vansteenkiste et al., 2004; Vessey, 2007). We thus propose that:

H8 *e-learning continuance intention has a positive effect on individual performance*

4. Methodology

4.1. Data collection and sample characteristics

The online questionnaire was employed in this study to test our research model, and the data was collected from June to November 2011 in New Zealand using a structured self-administered questionnaire. We chose the accounting profession, which includes auditors, financial accountants and managerial accountants, as our target population. This profession was chosen because: a) e-learning is used for their

continuing professional development[1] (CPD), which is a key requirement for retaining their professional registration, and b) various professional accounting organizations actively manage and advocate for CPD activities. These reasons make it more likely that the motivation for the study will resonate with individuals in this profession, as they will be aware of the importance of investigating the topic. In addition, a large proportion of firms in the accounting industry are small-and-medium-sized enterprises (SMEs).

To ensure that the relevant population responded to the survey, professional accounting organizations, such as Association of Certified and Chartered Accountants (ACCA), Certified Practising Accountants Australia (CPA Australia), and the New Zealand Institute of Chartered Accountants (NZICA), were contacted to see if they would support the project. In return for their assistance, these organizations were offered a report summarizing the findings of the survey as an incentive. Once their approvals were received, the organizations were sent a short paragraph on the survey and the link to the survey. They published this on their websites and/or sent it their members as an email notice. To improve the response rate, all respondents were offered an equal opportunity to win two NZ$50 gift vouchers. In addition to publicizing the survey through the professional accounting organizations, snowball sampling was also used to increase the response rate. 250 survey invitation letters were also sent to accountants in accounting firms located across New Zealand, and they were requested to forward the survey invitations to other accountants they were acquainted with. Non-respondents were contacted two weeks after the initial mailing by email or telephone to remind them to complete the survey.

A total of 34 valid surveys were completed and returned[2] 19 (55.9 percent) respondents were female and 15 (44.1 percent) were male. Around 80% of the participants worked in small firms with less than 50 employees. The largest group of participants (52.9 percent) was aged between 20 and 40, and about a third was between 41 and 50. About half of the respondents were accredited with NZICA, while 29.4 percent were part of CPA Australia. Almost all (97.1 percent) of them needed CPD to maintain their professional accreditation. 64.7 percent of the respondents had attended professional training in the last 12 months. Most (47.1 percent) respondents were university graduates, and a third of them (32.4 percent) had master's degrees. 11.8 percent of the working respondents had less than 5 years of work experience, while 32.4 percent had between 11 and 20 years of work experience. Half of the sample had between 6 and 10 years of experience in the field of accounting, and 32.4 percent had less than 5 years of experience. Almost all (91.2 percent) of the respondents were working (see Appendix A).

4.2. Measures

The measures for the survey (Appendix B) were obtained from prior studies. All items were measured using seven-point Likert-type scales with anchors from “strongly disagree” to “strongly agree”. Digital literacy was measured as the sum of seven items, following Hargittai (2005). The items for performance expectancy, effort expectancy, and social influence were adapted from Venkatesh et al. (2003), and we used the scale for continuance intention from Bhattacherjee (2001). To assess individual performance, our focus was on individual perceptions of performance. A subjective measure of performance was preferred in this case because of the challenges of measuring the outcomes of self-managed training using an objective measure, especially given the range of contexts in which e-learning can be used. Thus, the well-established measure of perceived usefulness was used to measure performance following prior literature (e.g. Goodhue & Thompson, 1995; Stone, Good, & Baker-Eveleth, 2007).

5. Data analysis

Partial least squares (PLS), a variance-based latent variable structural equations modeling technique, was used for data analysis. PLS uses an estimation approach that places minimal demands on sample size and residual distributions (Chin, 1998), so that multivariate normality is not needed for estimating parameters. It is also useful for avoiding any estimation bias that may arise when covariance-based structural equation modeling (CBSEM) techniques are used for models that include new measures and structural paths (Chin, 2010).

PLS is particularly suited to smaller data sets compared with other CBSEM techniques, such as LISREL, EQS and AMOS (Chin, Marcolin, & Newsted, 2003). A commonly accepted guideline for determining the minimum sample size is that it should be at least 10 times the number of predictors in the most complex relationship of the model (Barclay, Higgins, & Thompson, 1995; Chin, 1998; Chin & Newsted, 1999; Goodhue, Lewis, & Thompson, 2006). In our research model, the most complex relationship comprised the continuance intention construct (CI) with three predictors: performance expectancy (PE), effort expectancy (EE), and organizational support (OS). Thus, applying the aforementioned guideline would yield a minimum sample size of 30 for this study. Prior PLS studies, especially in the field of technology acceptance, have revealed that stable and reliable results can be obtained with samples of this size and smaller (Kahai & Cooper, 2003; So & Bolloju, 2005; Venkatesh & Davis, 2000; Yoo & Alavi, 2001).

Smart PLS 2.0 (Ringle, Wende, & Will, 2005) was used to test the proposed model. The model fit evaluation was conducted in two phases. First, the measurement model was assessed, in which the reliability of the measures, and their convergent and discriminant validity was assessed. Second, the structural model, which evaluates the hypotheses, was tested (Chin, 1998; Hulland, 1999).

5.1. Validity and reliability

To assess the reliability of the measures, we examined the composite reliability (CR) and Cronbach's alpha statistics (Table 1). The CR values vary from 0.86 to 1.00, while the Cronbach's alpha values vary from 0.76 to 1.00,[3] thus exceeding the minimum value of 0.7 and demonstrating adequate reliability. To assess convergent validity, three criteria were examined: i) the factor loadings of the items on the latent variables should exceed 0.707, ii) the construct reliabilities should exceed 0.70, and iii) the average variance extracted (AVE) by each

[1] Examples include: http://www.nzica.com/elearning.aspx, http://virtuallearn.accaglobal.com/pages/, and http://www.cpaaustralia.com.au/cpa-program/my-online-learning.

[2] The low number of responses, although not uncommon in other studies in this field (e.g. Van Raaij & Schepers, 2008) may be due to the novelty of the phenomenon; that is, only relatively few people may be using Web 2.0 technology for their e-learning.

[3] The highest value of 1.00 for CR and Cronbach's alpha is from the digital literacy measure, which is a summed measure of an individual's awareness of various IT-related terms.

Table 1
Reliability and convergent validity of constructs.

	AVE	CR	Cronbach's alpha	Mean	Std. Dev.
DL	1.00	1.00	1.00	4.32	3.55
ISI	0.96	0.98	0.96	5.24	2.05
PE	0.83	0.95	0.93	5.54	3.26
EE	0.89	0.97	0.96	5.55	3.39
OS	0.94	0.97	0.94	5.28	1.94
CI	0.68	0.86	0.76	4.27	1.84
Perf.	0.73	0.91	0.88	5.50	3.73

construct should exceed 0.50 (Fornell & Larcker, 1981). The factor loadings of the indicators (Table 2) are greater than 0.707, the composite reliability values exceeded 0.70, and the AVE was much higher than 0.50, thus providing evidence for convergent validity.

Two tests are suggested for discriminant validity by Chin (2010): i) whether the average variance extracted (AVE) of each construct exceeds the squared correlation shared between the construct and other constructs in the model, and ii) whether within-construct item loadings are greater than the inter-construct item loadings by 0.10 or more. From Table 2, we find that each AVE is larger than the matched squared inter-construct correlations.

Table 3 shows that each indicator loads higher on their own constructs than on others. In sum, the fit criteria exceed the threshold levels commonly recommended in the literature, suggesting that the constructs used in this study show a high degree of validity and reliability.

5.2. Testing of hypotheses

The hypothesized relationships were evaluated next by examining the path coefficients in the structural model. Fig. 2 shows the path coefficients for each hypothesized path, their significance (t-values larger than 1.96 indicate a significance level of $p < 0.05$), and the R^2 values for the two dependent variables: continuance intention and performance.

Fig. 2 indicates that all of the hypothesized relationships are significant, except for the paths between: i) effort expectancy and continuance intention, and ii) organization-level social influence (OS) and continuance intention. Digital literacy has a direct positive impact on performance expectancy and effort expectancy ($\beta = 0.155$ and 0.683 respectively), as does individual-specific social influence (ISI) ($\beta = 0.316$ and 0.404 respectively). As in prior studies, performance expectancy has a direct positive impact on continuance intention ($\beta = 0.388$), and the latter significantly affects individual performance ($\beta = 0.575$).

Unlike covariance-based structural equation modeling approaches such as EQS and LISREL, PLS does not have a single goodness-of-fit measure. This is because its objective is to maximize the variance explained, while the objective of covariance-based techniques is to minimize the difference between the observed and reproduced covariance matrices. The predictive value of a PLS model can thus be assessed in the same way as OLS regressions-by looking at the R^2 values of the endogenous constructs (Chin, 2010). The model explains 58 percent of the variance in performance, 53 percent of the variance in continuance intention, 50 percent of the variance in performance expectancy of use, and 28 percent of the variance in effort expectancy in use. These R^2 values are similar to the findings of previous studies on the acceptance and use of e-learning and Web 2.0 technologies (e.g. Payne, 2008; Van Raaij & Schepers, 2008).

6. Discussion

E-learning provides benefits such as access to a wide network of peers, more up-to-date learning resources, and lower training costs. It is also a field that has seen rapid changes, especially in the last decade, in terms of the types of technologies being used, the range of providers and users, and its ability to complement traditional classroom-type training. This study examined the effect of individuals' intention to continue using e-learning on their job performance, and how their level of digital literacy affected this relationship through its effect on performance and effort expectancy. A research model, adapted from UTAUT, was developed to understand these relationships, and data was gathered via a questionnaire survey to test several hypotheses.

The results showed that the intention to continue using e-learning significantly affects individual performance, legitimizing the enormous investments organizations have made in e-learning and providing evidence that engaging in e-learning is a valuable activity for individuals. As in prior studies (e.g. Chiu & Wang, 2008; Chou et al. 2010), performance expectancy was a significant predictor of an individual's continuance intention. However, surprisingly, effort expectancy and organization-level social influence did not significantly affect continuance intention, and ultimately users' performance.

One argument that could be made for the lack of a relationship between effort expectancy and continuance intention is that using e-learning, unlike other work-related technologies, depends on the quality of the system's design as well as the content matter embedded in the system. While an e-learning system may be easy to use, an individual may not be keen to continue using it if it does not have useful

Table 2
Squared correlations between the Latent Variables, with AVEs in the Diagonal.

	DL	ISI	PE	EE	OS	CI	Perf.
DL	1.00						
ISI	0.002	0.96					
PE	0.03	0.48	0.83				
EE	0.11	0.18	0.64	0.89			
OS	0.03	0.66	0.62	0.30	0.94		
CI	0.004	0.18	0.22	0.14	0.15	0.68	
Perf.	0.01	0.16	0.19	0.13	0.20	0.58	0.73

Table 3
Factor loadings and discriminant validity.

	DL	ISI	PE	EE	OS	CI	Perf.
DL	1.00	0.04	0.18	0.33	0.16	0.06	0.10
ISI1	0.07	0.98	0.65	0.40	0.78	0.38	0.37
ISI2	0.02	0.98	0.70	0.42	0.81	0.44	0.42
PE1	0.14	0.59	0.92	0.79	0.67	0.48	0.43
PE2	0.18	0.63	0.95	0.72	0.72	0.44	0.41
PE3	0.15	0.72	0.94	0.73	0.78	0.42	0.42
PE4	0.21	0.58	0.84	0.67	0.69	0.37	0.36
EE1	0.22	0.55	0.88	0.92	0.69	0.42	0.41
EE2	0.35	0.27	0.72	0.95	0.45	0.29	0.26
EE3	0.36	0.34	0.66	0.95	0.41	0.37	0.32
EE4	0.35	0.37	0.71	0.95	0.48	0.34	0.32
OS1	0.11	0.86	0.73	0.50	0.97	0.37	0.42
OS2	0.20	0.72	0.80	0.57	0.97	0.38	0.46
CI1	0.11	0.43	0.52	0.45	0.47	0.90	0.74
CI2	−0.08	0.13	010	0.20	0.03	0.75	0.52
CI3	0.06	0.40	0.42	0.21	0.33	0.78	0.55
Perf.1	0.01	0.24	0.22	0.18	0.25	0.61	0.87
Perf.2	−0.05	0.37	0.31	0.20	0.42	0.37	0.72
Perf.3	0.11	0.42	0.46	0.38	0.52	0.68	0.94
Perf.4	0.19	0.36	0.49	0.39	0.38	0.80	0.88

content. For example, if the material is outdated, overly simplistic, or unclear, users will find it difficult to integrate it into their existing knowledge base, because they will have to expend more effort in sifting through the material to find out which content is worth learning. This indicates a shortcoming of the effort expectancy construct in the e-learning context. The items for the construct measure the system's interface and technical attributes, not the quality of the content embedded in it, which may be a more important predictor of the continued use of an e-learning system. For example, an important aspect of professional development in the accounting industry is to provide updated guidance on new auditing standards and practice guidelines. These can be very detailed and voluminous, but are critical for auditors to make the necessary judgments when performing their jobs. They are even more important for those working in SMEs, as they have a limited pool of peers they can turn to within their firm for advice or guidance. If an e-learning system for such guideline is easy to use, but has incomplete or irrelevant material, then it is likely that it will not be used by accountants for their professional development. Future researchers should consider expanding the measure to include items, perhaps from the learning literature, that pick up on these additional dimensions.

Unlike prior studies (e.g. He & Wei, 2007; Venkatesh et al. 2003), this study did not find a significant relationship between organizational support and continuance intention. One possible reason for this result could be the context within which this study was conducted. Research on continuance intention that has taken place *within organizations* has studied technologies that affect organizational-level outcomes. For example, He and Wei (2007) investigated the use of a knowledge repository within an IT firm and Roca and Gagné (2008) examined corporate e-learning with various United Nations agencies. A parallel stream of research on continuance intention has examined individual behavior *outside organizations*, and looked at the use of online services by individuals, such as online banking (Vatanasombut, Igbaria, Stylianou, & Rodgers, 2008), online tax filing (Hu, Brown, Thong, Chan, & Tam, 2009), and online auctions (Wang & Chiang, 2009). In this latter set of studies, individuals use technology to complete tasks which have clearly-defined outcomes that are visible after a fairly short interval-for example, whether you have won or lost an online auction, or whether you were able to carry out a particular banking transaction.

In comparison, the context of the present study – the use of e-learning for continuous professional development (CPD) by individuals – is distinct from the two sets of studies discussed. The goal of CPD is to enhance or maintain individual competence, whether knowledge or skills (Mott, 2000; Ryan, 2003), not organizational effectiveness[4] In addition, the outcomes of CPD, besides being needed to retain one's registration or accreditation in a particular profession, can only be observed after a certain length of time. The value of the skills and knowledge that are obtained from CPD becomes apparent over time when these competencies are used by a professional in the completion of her daily tasks. Thus, unlike much earlier research on continuance intention that took place in contexts where the outcomes of technology use were organizationally-directed or obvious after a short span of time, the consequences of using e-learning for CPD are focused on individuals and visible after a much longer time interval. These attributes make it less likely for organizations to offer support, such as training or policy incentives, for their employees using e-learning for their CPD, because the outcomes of doing so are less about organizational effectiveness than the maintenance of individual skills. Thus, the absence of a significant relationship between organizational support and continuance intention in this study can be explained by it taking place in a context where organizational support is less likely to occur.

As hypothesized, digital literacy significantly predicted both effort expectancy and performance expectancy. This was a predictable finding in the accounting context, because of the tremendous growth in the use of technology in the form of spreadsheets, workflow modeling tools, and databases in the recent decades. Computer-aided auditing tools and techniques (CAATs) are frequently used to improve audit efficiency and effectiveness (Bierstaker, Janvrin, & Lowe, 2014), and data analytics is increasingly being emphasized in audit engagements (Wang & Cuthbertson, 2014). At the same time, e-learning is popular with professional accounting bodies, who are trying to service their global membership base and reduce the costs of transmitting learning. This formal expansion is paralleled by the growth in blogs, wikis and online forums which support informally-managed and often self-led learning. Thus, having a high level of digital literacy is a valuable attribute for accounting professionals today, both to carry out their daily work and to expand their knowledge base and skill-set.

Interestingly, digital literacy had a stronger effect on effort expectancy compared to performance expectancy. This indicates that individuals' level of comfort with new technology strongly influences the cognitive burden they face when adopting new IT, but has a weaker

[4] While it could be argued that more competent individual employees are necessary to improve organizational performance, the latter outcome is only distally-related to CPD.

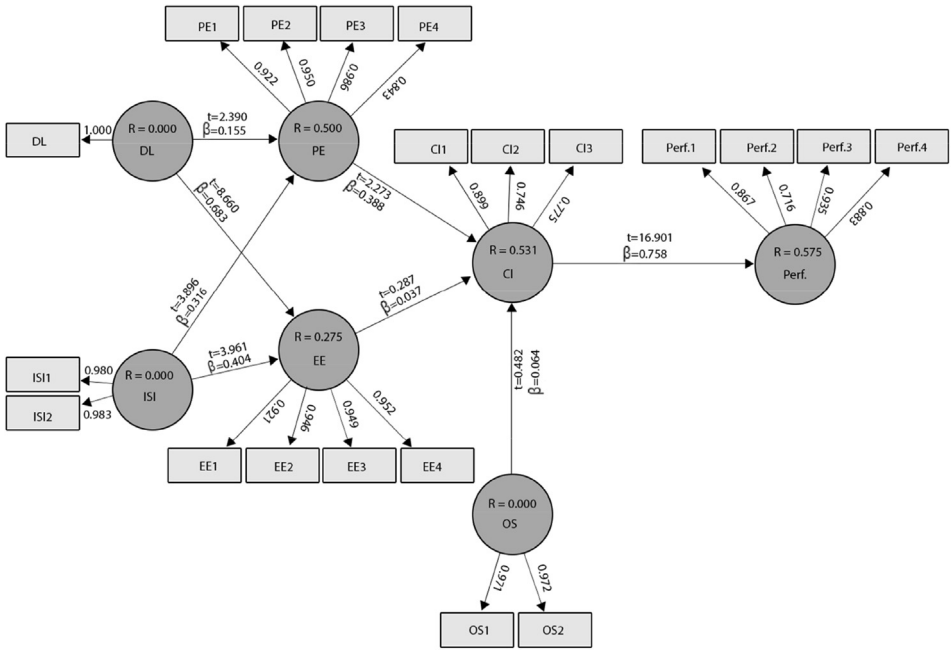

Fig. 2. PLS results.

impact on the performance improvements they expect from adopting the new technology. This result was not completely unexpected because it is similar to Brown, Dennis, & Venkatesh (2010) finding that computer self-efficacy significantly influenced effort expectancy but not performance expectancy. More broadly, the greater impact of digital literacy on effort expectancy reflects the close relationship that has been found between effort expectancy and other related personal competencies, such as personal innovativeness (e.g. Lu et al. 2005; Yi, Jackson, Park, & Probst, 2006). Personal innovativeness also reduces anxiety around computer use (Thatcher & Perrewé, 2002; Van Raaij & Schepers, 2006), and it is possible that this relationship extends to digital literacy.

One possible explanation for the weaker link between digital literacy and performance expectancy is that, in the e-learning context, this relationship could be moderated by a user's existing level of content or professional knowledge. Existing knowledge affects the perceived ease of use of a technology and its perceived benefits (Lippert & Forman, 2005). A key aspect of learning is making links between knowledge and how it can be used in the context the individual learner wants to do so (Laurillard, 2002). Individuals with a high level of digital literacy may be able to manipulate and access an e-learning system easily, but if their knowledge of their field is not sufficiently broad or deep, they may only receive limited benefits because they do not know the type of content they need to acquire to improve their performance.

The role of digital literacy can be compared with interpersonal social influence. While the former had a stronger effect on effort expectancy than performance expectancy, the impact of interpersonal social influence on these two constructs was approximately similar. This result draw attention to the importance of understanding users as social actors, not disembodied and isolated individuals (Lamb & Kling, 2003). Users interact with their professional peers and friends while in the process of engaging with new technologies, developing affiliations and identities. The information they obtain during these interactions provide them with guidance as to the level of effort they need to exert to adopt and continue using a new technology, and the performance outcomes they could expect after using it. These effects are especially strong in the case of e-learning in the CPD context, because the body of knowledge and the tools in which it is embodied are usually developed by the professional community itself, so that individuals have to look to their peers' practices and experiences. CPD participation also incorporates the suggestion of collegial learning, where the emphasis is on the absolute advancement of the entire profession, not relative placement vis-à-vis one's peers. Thus, while digital literacy had a weaker effect on performance expectancy than effort expectancy, the social influence of individual peers had a consistently strong impact on both constructs.

7. Significance of the study

This study is significant for a number of reasons. First, it showed the value of including digital literacy in studies of e-learning use. Second, it contributed new data to the growing body of research on the impact of e-learning on individual performance. Third, it clarified the separate impact of differing sources of social influence- organizations and individuals-on the use of e-learning. Fourth, the findings indicate that e-learning studies should also consider the different levels of knowledge that learners start off with, in addition to the other relevant individual and contextual attributes.

8. Practical implications

This study has implications for three groups of practitioners: e-learning users, e-learning/CPD providers, and developers and authors of e-learning services and tools. The survey highlights that few individuals are using Web 2.0 technology for their e-learning, even though it offers a range of benefits, such as the ability to choose the tool that best fits their needs and preferences and the ability to interact with their peers while learning. Since performance expectancy is a key determinant of continuance intention, managers should increase the awareness of these resources and their potential to enhance employees' performance. The results of the study pointed out that individuals with a higher

level of digital literacy had a better appreciation of the value of using e-learning for their CPD. One way to increase the level of digital literacy of staff who are less familiar with such technologies would be to set up a Web 2.0-based e-learning tool, such as a wiki, a blog, or a social network, in-house. This would provide this group of employees with a comfortable setting to explore and familiarize themselves with the use of such technologies, and increase their trust in the quality of the content and the reliability of the e-learning service.

Another option could be to identify "power-users" of e-learning tools and ask them to encourage their peers to obtain help from them. These champions could also help ensure that their colleagues' expectations are set at the right level by providing them with realistic examples of the extent to which these tools have helped the power-user. Finally, managers should ensure that they minimize infrastructure or policy constraints, such as the lack of a blogging platform or protocols that govern what can and cannot be shared on e-learning sites.

Professional associations should also work to promote wider awareness of e-learning services and incorporate them into their CPD frameworks. By creating online networks of like-minded learners, these associations may be able to increase their CPD fulfillment rate while lowering their costs. For example, as the accounting profession becomes more focused on wider aspects of information assurance and as the use of modern technologies such as XBRL (eXtensible Business Reporting Language) become more widespread, accountants have to increase their digital literacy so that they can take advantage of new opportunities and/or prevent the obsolescence of their skills. These changes are occurring across many industries and professional associations should aspire to increase the digital literacy levels of their members.

Developers of e-learning could possibly segment the market to serve professionals with high and low levels of digital literacy. They could provide more complex tools for the former group and more basic services for the latter. In addition, they could collaborate with professional organizations to make their members aware of the possible performance improvements the use of e-learning services could lead to, as well as the usefulness of these tools in helping them achieve their goals. This would address the performance expectancy aspect of encouraging adoption. Shifting from a world where e-learning is predominantly delivered offline to an interactive, dynamic, "always on" model of e-learning will be challenging, because it highlights key issues, such as: where does authority lie about interpretation? How much debate should there be on procedures or practices? Who monitors these sites for inaccuracies and who is responsible for correcting them? Addressing these issues will be a difficult trial for professional organizations and education providers.

Previous research has suggested that the use of e-learning has mainly been to provide access to and disseminate information (Bodell, Hook, Penman, & Wade, 2009). However, e-learning services allow users not only to retrieve information but also to use the network as a platform to create and own the data (O'Reilly, 2005). This phenomenon can support online reflection and community-based interaction and knowledge sharing (Bodell et al., 2009). This combination of content delivery and creation means that developers have to decide which aspect to prioritize, since learning can be a creative activity, not just a passive one. However, the users who prefer creating content may be the ones who are more digitally literate, and users who are less so may be put off from engaging in e-learning if its creative aspects are emphasized. This would be especially detrimental for an organization if the ones who are put off contributing to Web 2.0-based e-learning, by for example writing or commenting on blogs and social networks, are those with the most knowledge and experience. Thus, the level of digital literacy in an organization affects the balance that e-learning developers place on content creation versus distribution.

9. Limitations

The findings of the study should be read in light of its limitations. First, it was designed as a cross-sectional study, which limits its ability to determine causality. Future research could test this model longitudinally. This may possibly strengthen the effects of digital literacy, since it is conceptualized as an evolutionary construct.

Second, by focusing on New Zealand accountants only, the study's findings may be less generalizable to other contexts because of some unique aspects of the business environment. For example, the small population (4.5 million) is scattered across a relatively large landmass, which may prevent the diffusion of information through (physical) social networks, biasing the findings. Conducting comparative studies in different countries would offer an opportunity for comparing the findings and supporting or extending its results.

Third, the use of a self-administrated questionnaire may explain the inconsistency of the findings of the model with prior UTAUT studies. Self-administrated usage measures may be biased in a manner that they do not accurately represent adoption (Straub, Limayem, & Karahanna-Evaristo, 1995). In the context of the current study, it is likely that professionals' perceptions about their use of e-learning and its impacts may reflect their usage of IT for more general learning that may not be relevant to their professional requirements.

Fourth, the use of a single survey to gather data on both independent and dependent variables may lead to common method bias (Sharma, Yetton, & Crawford, 2009). Future research could minimize this by using system-generated data on adoption and continued use, or by using techniques such as a marker variable. Fifth, the 7-item measure of digital literacy may be dated now since it was developed seven years ago. Advances in technology, such as the spread of mobile devices and the consumerization of technology, suggest that alternative measures of digital literacy should be developed that evaluate individuals' knowledge and use of social media technologies, cloud computing services, and mobile devices.

Last, a challenge with this study is in defining e-learning. A variety of technologies are involved in delivering e-learning, including webcasts, podcasts, online forums, packaged tutorials, message boards, and blogs. Besides having different levels of ease of use, these technologies can also be distinguished in terms of their level of structure, interaction, and (in)formality. Individual learners may not view them as being part of the same category of e-learning, and may instead group them into different clusters based on how and when they are used. For example, some technologies, such as wikis, may be used for obtaining an initial understanding of a concept or practice, while others, such as forums, may be used for asking more advanced questions. If this is the case, asking about e-learning in general may mask variations in individual perceptions and attitudes toward specific types of technologies, and their usefulness at different stages of the continuing education process. Future research on e-learning should thus focus on one particular mode or stage of e-learning to clarify how individual differences, such as digital literacy, influence decisions on adopting and continuing to use e-learning.

10. Conclusion

Although e-learning is being used more intensively in recent years and some professionals have demonstrated a willingness to explore new approaches, many organizations still hold reservations about becoming involved with innovative pedagogical tools and have not yet

realized what can be achieved with them (Ho & Kuo, 2010). The range of possibilities offered by e-learning has not been fully exploited (Hsbollah & Idris, 2009). For example, some organizations continue to limit their use of such tools to their repository functions, perhaps pushed to do so because of the poor IT skills of their employees.

Despite its limitations, this study has contributed to research and practice in e-learning adoption. The results revealed the impact of factors such as performance expectancy and individual-level social influence on the continuance intention of e-learning and its effects on their performance. Digital literacy as a construct deserves more attention in e-learning and other settings because it incorporates the idea of IT use as a skill that evolves. In light of these findings, the study has offered various suggestions to different communities of practitioners to improve their performance with regards to the adoption and continued use of e-learning.

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Appendix A. Demographics of sample respondents ($N = 34$)

	Frequency	Percentage
Gender		
Female	19	55.9
Male	15	44.1
Age		
Below 20	0	0
20–30	10	29.4
31–40	8	23.5
41–50	11	32.4
Above 50	5	14.7
Accredited with		
NZICA	20	58.8
CPA	10	29.4
Others (e.g. ACCA)	7	20.6
Continuing professional development requirement		
Yes	33	97.1
No	1	2.9
Training undertaken		
Yes	22	64.7
No	12	35.3
Education		
University graduate	16	47.1
Master degree	11	32.4
PhD	3	8.8
Qualification e.g. ACCA	4	11.8
Currently working		
Yes	31	91.2
No	3	8.8
Work experience (years)		
Less than 5	4	11.8
6–10	7	20.6
11–20	11	32.4
21–30	9	26.5
More than 30	3	8.8
Accounting experience (years)		
Less than 5	11	32.4
6–10	17	50.0
11–20	4	11.8
21–30	2	5.9
More than 30	0	0.0
Is childcare needed?		
Yes	18	52.9
No	16	47.1
No of employees in firm		
Self-employed	3	8.8
Less than 10	7	20.6
11–20	6	17.6
21–30	5	14.7
31–50	6	17.6
More than 50	7	20.6

Appendix B. Survey instrument

Digital Literacy (DL) (sum of 7 items) – Hargittai (2005)

1. Do you know how to **download** a file from the World Wide Web to your computer?
2. How familiar are you with the following terms? **MP3**
3. How familiar are you with the following terms? **Preference setting**
4. How familiar are you with the following terms? **Refresh/Reload**
5. How familiar are you with the following terms? **Newsgroup**
6. How familiar are you with the following terms? **PDF**
7. How familiar are you with the following terms? **Advanced Search**

Individual-level Social Influence (ISI) – Venkatesh et al., (2003)

1. People who influence my behavior think that I should use e-learning for my CPD
2. People who are important to me think that I should use e-learning for my CPD

Organizational Support (OS) – Venkatesh et al., (2003)

1. The senior management of my organization has been helpful in the use of e-learning for my CPD
2. In general, my organization has supported the use of e-learning for my CPD

Performance Expectancy (PE) – Venkatesh et al., (2003)

1. I expect to find e-learning useful for my CPD
2. Using e-learning will enable me to accomplish tasks for my CPD more quickly
3. Using e-learning will increase my productivity in carrying out my CPD

Effort Expectancy (EE) – Venkatesh et al., (2003)

1. My interaction with e-learning will be clear and understandable
2. It will be easy for me to become skillful at using e-learning
3. I will find e-learning easy to use
4. Learning to operate e-learning will be easy for me

Continuance Intention (CI) – Bhattacherjee (2001)

1. I intend to continue using e-learning for my CPD, rather than discontinue their use
2. My intentions are to continue using e-learning for my CPD than use any alternative means (e.g. traditional learning)
3. If I could, I would like to discontinue my use of e-learning for my CPD

Performance (Perf.) – Bhattacherjee (2001)

1. Using e-learning improves my performance in managing my job
2. Using e-learning increases my productivity in managing my job
3. Using e-learning enhances my effectiveness in managing my job
4. Overall, e-learning is useful in managing my job

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