The impact of employee's perception of organizational climate on their technology acceptance toward e-learning in South Korea

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Abstract: To better understand the relationship between e-learning integration and organizational factors in South Korea, this study explored the influence of employees' perceptions of organizational climate on their technology acceptances toward e-learning in the workplace of South Korea. Employees' perceptions of organizational climate was evaluated using Litwin & Stringer's Organizational Climate Questionnaire (LSOCQ) and employees' technology acceptance toward e-learning was measured by the Unified Theory of Acceptance and Use of Technology (UTAUT). A canonical correlation suggested that employees' perceived organizational climate can influence their acceptance levels toward e-learning, which implies the importance of addressing organizational issues while integrating e-learning into workplaces in South Korea.

Keywords: Organizational climate; e-Learning; Technology acceptance; UTAUT; Canonical correlation analysis

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1. Introduction

Due to the development of technology, e-learning is getting more and more utilized in the workplace as well as in the classrooms. According to American Society for Training and Development (ASTD), almost one third of training for employees in the workplace has been implemented through technology (ASTD, 2010). As e-learning is being used more frequently, many studies have explored factors that might affect the successful implementation of e-learning (Govindasamy, 2002; Liaw, 2004; Selim, 2007; Soong, Chan, Chua, & Loh, 2001; Sun, Tsai, Finger, Chen, & Yeh, 2008). Among a variety of e-learning factors, user's acceptance toward e-learning has gained much attention.

According to several studies (Lee, Yoon, & Lee, 2009; Marchewka, Liu, & Kostiwa, 2007; Masrom, 2007; Roca, Chiu, & Martinez, 2006), if a user perceives a positive acceptance toward e-learning, the outcome of implementing e-learning tends to be successful. Unfortunately, employees' acceptance levels toward e-learning in the workplace have rarely been investigated, even though research about students and teachers' acceptance levels in the classrooms toward e-learning has been well-studied (Liaw, Huang, & Chen, 2007; Park, 2009; Yuen & Ma, 2008).

Nevertheless, the critical factors for success in implementing e-learning can be summarized with three factors. First is the human factor. User attitude, learning styles, and instructor's attitude and teaching styles are included in this factor in evaluating the effectiveness of e-learning to an individual or a large group of people (Liaw, Huang, & Chen, 2007; Selim, 2007). Second is the content and technology factor, which includes the content format, structure, and authoring tools (Wang, Ran, Liao, & Yang, 2010). The last factor is the institutional factor that includes organizational policy, climate, or culture (Klein, Conn, & Sorra, 2001; Klein & Ralls, 1995; Romiszowski, 2004). Among these factors, organizational climate, one of the critical success factors that influence employees' beliefs and behaviors has not been examined to a significant extent in current literature.

Prior studies have conceptually suggested that employees' acceptances toward e-learning may be affected by organizational climate (Hofmann & Stetzer, 1996; Kozlowski & Salas, 2009; Maurer & Tarulli, 1994; Noe & Wilk, 1993; Schulte, Ostroff, Shmulyian, & Kinicki, 2009). Rare empirical studies, however, have attempted to investigate the relationship between organizational climate and employees' acceptances

toward e-learning in the workplace. From the perspective of international HRD, considering the pervasiveness of e-learning in South Korea across organizations, this lack of empirical understanding might impede many e-learning integrations and therefore impacting the effectiveness of human resource development activities in South Korean workplaces.

To address the aforementioned issue due to a deficiency of empirical research, this study aims to answer the following research question in a South Korea workplace:

- Is there any empirical relationship between perceived organizational climate and technology acceptances toward e-learning in the workplace?

2. Literature review

Derived from the research question, the literature review consists of four sections. The first section discusses e-learning in the workplace in terms of its definitions and applications. Second, the discussion shifts to the importance of e-learning in the workplaces of South Korea. The third section discusses factors that could impact the successful integration of e-learning in organizations. Finally the discussion illustrates the importance of considering technology acceptance as well as organizational climate while planning for e-learning integration in the workplace.

2.1. e-Learning in the workplace

To dominate the market in advance in the age of transformation and innovation, organizations need to adopt new technologies swiftly and their employees need to acquire extensive knowledge within a short time. For this to happen, companies strategically focus their attention on training employees. In an effort to pursue efficiency, companies perceive the necessity of learning independent of time and space by applying computer-based training (CBT), web-based training (WBT) and other computer-based technical aspects to deliver their employees' learning (Horton, 2006). Notably, due to the widespread use of the Internet, organizational members have come to take advantage of e-learning beyond temporal and spatial constraints in order to share information and technology (Rosenberg, 2006).

According to ASTD (2011), the Fortune Global 500 companies used more than 40% of training content via e-learning, which is the highest usage of technology. The world market has invested $ 2 billion (17.2%) out of $11.7 billion in e-learning in 2008 (Joo, Lim, & Park, 2011). Such a lion share of investment across organizations consequently elevates the roles of e-learning in the workplace, which often involves internal knowledge management within organizations (Bersin, 2005). In recent years, with the growth of corporate e-learning, proper learning of the personnel in charge of e-learning and efficient linkage with systematic knowledge management have emerged as significant components for intellectual management and improvement of business performance (Ertl, 2010).

Despite such significance, however, significant gaps remain existent between corporate benefits of e-learning and those of individual employees (Servage, 2005). That is, although employees perceive that knowledge acquisition through e-learning is feasible, in reality the organizational implementation of e-learning is rarely effective (Tynjala & Hakkinen, 2005). Such misalignment in the workplace therefore warrants further investigations.

2.2. e-Learning in South Korea

Similar to the United States, corporate e-learning in South Korea has grown rapidly in the past decade (Lee, Byun, Kwon, & Kwak, 2008). Upon observing the development of information technology and the Internet, e-learning in South Korean workplaces has been mandated by the Ministry of Labor in 1999, which at present is in the stage of expansion to industrialization (Lim, 2007). According to the annual report of the e-learning industry by the Ministry of Knowledge Economy, the market size of e-learning has exceeded $ 1.7 billion with the averaged annual growth rate of 10%; as for the organizations that implement e-learning, their e-learning operations have grown more than 400% between 2005 and 2010 (Korea Education and Research Information Service, 2010).

One main reason for the Korean government to promote e-learning in the workplaces is to reduce training costs. However, the government initiative has fueled complacency as companies hesitated to develop their own e-learning courses for specific purposes. For example, organizations would apply quality assurance measures criteria that are narrow and ambiguous when evaluating e-learning courses (Cho & Lee, 2004). On the other hand, such top-down e-learning policies have emphasized the position of companies that are the suppliers in establishing e-learning application plans of companies (Jang & Yoo, 2006). As a result, individual learners' readiness and learning characteristics for e-learning were often neglected by organizations.

2.3. Critical success factors of e-learning in the workplace

Although corporate e-learning draws attention as an important delivery method, studies on the effects of e-learning has not caught up with the rapid growth of e-learning. Among a few studies that did situate e-learning in the context of organizations, McPherson and Nunes (2006) categorized the organizational critical success factors of e-learning largely into leadership and cultural issues, design issues, technological issues and delivery issues and reported that the leadership and cultural issues should be crucial factors determining the success or failure of change and innovation. In discussing critical success factors for e-learning, Joo, Lim, & Park, (2011) identified organization's leadership, support and willingness to provide funding as well as to recognize and reward as main critical success factors.

Wang, Ran, Liao, and Yang (2010) pointed out that many researchers have paid attention to the content of e-learning (Mahmood, Kamil, & Ferneley, 2006) instead of considering individual or environmental factors of e-learning in the workplace. Particularly, they stressed that individual and organizational learning needs, connecting learning to work performance and supporting social interactions among individuals would be important factors for successful e-learning in the workplace. To address this deficiency in the literatre, it is necessary to focus on investigating organizational climate that might support employees' acceptances toward e-learning, which this study intended to accomplish.

2.4. Technology acceptance theory

In addition to organizational factors, successful e-learning implementation also requires users' full participation. Although organizations have developed advanced technology to support employees' learning and performance in the workplace, they will not be worthwhile if users choose not to use them. Organizations also believe the myth that employees will always use the technology systems as long as they are available (Lee,

Yoon, & Lee, 2009; Rosenberg, 2006). To maximize the utilization of technology, users' acceptance level is an important factor (Keil, 1995; Venkatesh, Morris, Davis, & Davis, 2003).

Among various technology acceptance models, employees' technology acceptances toward e-learning are often measured by the Unified Theory of Acceptance and Use of Technology (UTAUT). UTAUT was developed and validated by Venkatesh, Morris, Davis, and Davis (2003) has synthesized eight existing theories to predict the intention to use technology in an organization, which consists of Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), Motivational Model (MM) (Davis, Bagozzi, & Warshaw, 1992), Theory of Planned Behavior (TPB) (Ajzen, 1991), Technology Acceptance Model (TAM) (Davis, 1989), a combined TAM and TPB model, Model of PC utilization (Thompson, Higgins, & Howell, 1991), Innovation Diffusion Theory (Moore & Benbasat, 1991), and Social Cognition Theory (Compeau & Higgins, 1995) (Venkatesh, Morris, Davis, & Davis, 2003). As a result, UTAUT has eight constructs: performance expectancy, effort expectancy, social influence, facilitating conditions, self-efficacy, anxiety, behavioral intention to use, and attitude towards using technology.

UTAUT has been used to measure users' technology acceptances toward a variety of technology such as Web 2.0 applications, e-learning systems, and content management systems (Koufaris, 2002; Landry, Griffith, & Hartman, 2006; Masrom, 2007; Selim, 2003).

Recent studies have also focused on a wide variety of factors that affected students' acceptance of e-learning beyond the scope of UTAUT. Lee, Yoon, and Lee (2009) conducted a study on learners' acceptance of e-learning in South Korea. They revealed that the success of e-learning was affected by instructor characteristics, teaching materials, perceived usefulness, playfulness and perceived ease of use. These results seem to be consistent with previous studies about e-learning in other countries. Several researchers also agreed that learner's attitude is an important factor that affects the successful implementation of e-learning (Liaw, Huang, & Chen, 2007; Selim, 2007). Ho, Kuo, and Lin (2009) further argued that organizations could improve employees' e-learning outcomes by facilitating positive acceptances. While individual's technology acceptance has been used to evaluate the acceptance of e-learning (Borotis & Poulymenakou, 2009; Lee, Hsieh, & Ma, 2011; Lee, Yoon, & Lee, 2009; Park, 2009), current literature is lacking empirical studies conducted in authentic workplace settings that consider organizational factors.

2.5. Organizational climate

Organizational climate research has been a subject of numerous reviews because of its importance in analyzing and understanding organizational behavior and the attitudes of individuals in organizations (Denison, 1996; James & Jones, 1974; Litwin & Stringer, 1968; Schneider, 1990; Tagiuri & Litwin, 1968). Gilmer (1961) commented that organizations differ not only in physical structure but also in the attitudes and behavior they elicit in people. Gilmer (1961) further emphasized that organizational characteristics affect the behavior of individuals in the workplace. As one of the influencing factors in organizations, organizational climate should also be considered a crucial factor for successful implementation of e-learning.

Organizational climate is defined as a set of measurable properties of the work environment (Litwin & Stringer, 1968). Muchinsky (1976) defined it as perceptions of the work environments by employees, which may differ according to organizations.

Rafferty (2003) described organizational climate as the internal environment experienced by the employees. Schneider (1975, 1985) defined it as the shared perceptions of employees concerning practices, procedures, and behaviors that get rewarded and supported in the workplace. Research has supported the same notion that individuals' behaviors and perceptions are influenced by their environments (Downey, Hellriegel, & Slocum, 1974; Pritchard & Karasick, 1973; Shadur, Kienzle, & Rodwell, 1999).

To measure organizational climate, many researchers have categorized various variables. Litwin and Stringer (1968) categorized nine variables to measure organizational climate. The nine typical variables are as follows (Gray, 2007, pp. 58 - 59):

1. Structure. The feeling that employees have about the constraints in the group, such as how many rules, regulations, and procedures there are; is there an emphasis on 'red tape' and going through channels, or is there a loose and informal atmosphere?
2. Responsibility. The feeling of being your own supervisor; not having to double check all your decisions; when you have a job to do, knowing that it is your job.
3. Reward. The feeling of being rewarded for a job well done; emphasizing positive rewards rather than punishments; the perceived fairness of the pay and promotion policies.
4. Risk. The sense of riskiness and challenge in the job and in the organization; is there an emphasis on taking calculated risks, or is playing it safe the best way to operate?
5. Warmth. The feeling of general good fellowship that prevails in the work group atmosphere; the emphasis on being well-liked; the prevalence of friendly and informal social groups.
6. Support. The perceived helpfulness of the managers and other employees in the group; emphasis on mutual support from above and below.
7. Standards. The perceived importance of implicit and explicit goals and performance standards; the emphasis on doing a good job; the challenge represented in personal and group goals.
8. Conflict. The feeling that managers and other workers want to hear different opinions; the emphasis placed on getting problems out in the open, rather than smoothing them over or ignoring them.
9. Identity. The feeling that you belong to a company and you are a valuable member of a working team; the importance placed on this kind of spirit.

The Litwin and Stringer's (1968) Organizational Climate Questionnaire (LSOCQ) is one of the widely used instruments to measure organizational climate in the workplace (Rogers, Miles, & Biggs, 1980; Woodman & King, 1978), which has been used frequently in business organizations (Toulson & Smith, 1994).

2.6. Organizational climate and e-learning

If employees' perceptions of climate influence their behaviors, it seems natural to assume that the organizational climate can be an important antecedent to their acceptance towards technology. If employees realize that organizations put forth a substantial amount of effort to implement a technology, a climate is created which influences employees' behaviors by altering their attitudes and perceptions within the organization (Hofmann & Stetzer, 1996). Kozlowski and Hults (1987) investigated the relationship between organizational climate and technological innovation and revealed that appropriate organizational climate is an important element for fostering employees' innovative behaviors. The research by Kozlowski and Hults (1987) has shown that employees produce a positive response towards new technology when an organization focuses on updating technology. Therefore, the positive organizational climate created by an organization's efforts to update technology can influence employees' willingness to accept the new technology systems (Kanter, 1983; Kaufman, 1978; Kozlowski & Hults, 1987).

Considering e-learning a technology system, little research, however, has explored the relationship between organizational climate and e-learning in the workplace. Perhaps e-learning can also contribute to improving organizational climate. Therefore, this study is important for two reasons. Through empirical research, measuring the acceptances of employees towards e-learning is helpful to diagnose present employees' weaknesses as well as strengths. Research about the relationship between employees' perception of organizational climate and their acceptances towards e-learning is needed for human resources development (HRD) professionals to strengthen their e-learning implementation in the workplace.

As such, valid measures of climate are necessary for clearly identifying potential obstacles to implementing e-learning in the workplace. If such obstacles are revealed, then HRD professionals can successfully implement e-learning to target specific areas in which intervention is needed in the workplace.

3. Methodology

The purpose of this quantitative survey study was to investigate the relationship between employees' perceptions of organizational climate and their acceptance towards e-learning in the workplace. The following sections describe the research site, instrumentation, data collection, and data analysis.

3.1. Research site

A regional food service company of 1,500 employees in South Korea was selected as the site for this study. The food service company has been utilizing e-learning as a training tool since 2000 because employees have to work in dispersed locations. This food service company has eleven brands and 150 franchise stores, which include Korean restaurants, cafés, bakeries, and family restaurants in the main business districts of many cities.

In 2010, the food service company offered a total of 200 e-learning courses monthly in addition to 50 or 60 face-to-face training programs. Most e-learning courses were provided by external companies and only 20 e-learning courses were developed by internal HRD staff. The company required employees to take at least two or four e-learning courses based on their position held.

3.2. Instrumentation

The data collection instrument consisted of three components: (1) organizational climate derived from LSOCQ, (2) technology acceptances toward e-learning, and (3) employee's demographic information. An organizational climate survey questionnaire was used based on nine sub-constructs of LSOCQ. The LSOCQ includes structure (8 items), responsibility (7 items), reward (6 items), risk (5 items), warmth (5 items), support (5 items), standard (6 items), conflict (4 items) and identity (4 items). The reliability and validity of LSOCQ has been investigated by several researchers and have shown to be a meaningful and practical instrument (Campbell, Dunnette, Lawler, & Weick, 1970; Muchinsky, 1976). However, several studies reported disparate results of the validity and reliability of LSOCQ (Briggs, Miles, & Rogers, 1977; Downey, Hellriegel, & Slocum, 1974; Muchinsky, 1976; Rogers, Miles, & Biggs, 1980; Sims & LaFollette, 1975). Specifically, responsibility, risk, standards, and conflicts have showed less than .60 of loading scores, which indicated a low level of reliability (Sims & Lafollette, 1975). Thus, these four constructs were excluded in this study and a stable five constructs were used for data collection.

The UTAUT includes performance expectancy (4 items), effort expectancy (4 items), attitude (4 items), social influence (4 items), facilitating conditions (4 items), anxiety (3 items) and intention to use e-learning (3 items). The reliability and validity of the questionnaire was also examined by numerous studies (Oshlyansky, Cairns, & Thimbleby, 2007; Venkatesh & Davis, 2000). The reliabilities of all constructs were found to be acceptable and highly consistent (Alpha > .80) (Venkatesh, Morris, Davis, & Davis, 2003). In addition, the cross-cultural validity of the UTAUT tool was examined. It was utilized to measure students' technology acceptances toward e-learning in South Korea as well as different cultural contexts (Park, 2009; Oshlyansky, Cairns, & Thimbleby, 2007). The results clearly showed that this tool is robust enough to be used cross-culturally (Oshlyansky, Cairns, & Thimbleby, 2007). Thus, this study used UTAUT to measure employees' acceptance levels toward e-learning due to its reliability and validation in different contexts (Oshlyansky, Cairns, & Thimbleby, 2007).

All items are based on a 7-point Likert scale with response options ranging from strongly disagree (1) to strongly agree (7), since this format may increase the variability of responses (Russ-Eft & Preskill, 2009).

3.3. Data collection

The data were collected for three weeks in the third quarter of 2010 from the food service company in South Korea. In all, the online survey was distributed to around 1,000 employees by the HRD staff and 261 were returned, giving us a final response rate of 26.1%. Employees received questionnaires via the intranet and were asked to be the investigators using an online survey tool. The employees were assured of confidentiality by both the investigators and the organization's management.

3.4. Data analysis

The data analysis consisted of four stages. First, the data of LSOCQ and UTAUT instruments measured the reliability and validity (see Table 2 & 3). Second, we examined the descriptive statistics of employees' perception of organizational climate and their technology acceptances toward e-learning. Third, a canonical correlation analysis (CCA) was used to investigate between organizational climate and their technology acceptances

toward e-learning. CCA is the proper statistical way to examine the relationship between two multi- variable sets (Newton & Rudestam, 1999; Sherry & Henson, 2005). SAS statistical package was used for revealing the research question.

4. Results

4.1. Participants

Upon screening the 261 collected datasets, only 150 of them were analyzed due to incomplete survey responses. Of the 150 completed surveys, 47 were completed by males (33.6%), 93 (66.4%) by females and 10 (6.7%) were not answered. Most participants (92.6%) were in their twenties and thirties. Forty-nine (32.7%) participants were employees, sixty-six (44.0%) managers, and twenty-four (16.0%) were store managers, while 11 (7.3%) participants did not indicate their position in this company. Nearly half of the participants (49.3%) worked in Seoul at the time the survey was taken. Almost half of the participants (49.3%) had never experienced e-learning and 73 (48.7%) participants had experienced e-learning in the workplace. See Table 1 for the demographics of respondents.

Table 1
Demographics of the respondents (N=150)

Demographics		Number (%)	Demographics		Number (%)
Gender	Male	47 (33.6)	E-learning	Experienced	73 (48.7)
	Female	93 (66.4)	Experience	Inexperienced	73 (49.3)
	Missing	10 (6.7)		Missing	3 (2.0)
Age	<29	104 (69.3)	Position	Employee	49 (32.7)
	30-39	35 (23.3)		Manager	66 (44.0)
	40-49	1 (0.7)		Store manager	24 (16.0)
	Missing	10 (6.7)		Missing	11 (7.3)
Work	<2 years	47 (31.3)	Workplace	Seoul	74 (49.3)
experience	2-5 years	67 (44.7)	Location	Gyonggi	31 (20.7)
	5-10 years	22 (14.7)		Daejeon	3 (2.0)
	>10 years	3 (2.0)		Busan	12 (8.0)
	Missing	11 (7.3)		Chungcheong	2 (1.3)
				Gyengsang	2 (1.3)
				Jeolla	15 (10)
				Missing	11(7.3)
	Total	150(100.0)			

4.2. Descriptive statistics

Table 2 shows the remaining five factors (28 items) of organizational climate, which are structure, warmth, support, reward, identity and their reliability. The internal consistencies of the five factors vary from .812 to .849. Seven factors of technology acceptances (22 items) were measured for their reliability. Among seven factors, the internal consistencies of the six factors were good as they were above .80 except for the facilitating conditions. Facilitating conditions was .548, which is not acceptable and excluded in this study because an instrument is generally considered reliable when it has an alpha of .80 or higher on a scale of 0 to 1 (Rubin & Babbie, 2009). The reliability of the total remaining items (50 items) is .951(Cronbach's Alpha), which is good for further data analysis.

Table 2
The reliability of organizational climate and technology acceptances toward e-learning

Constructs/Factors		Items	Reliability	Cronbach's Alpha
Organizational Climate	Structure	8	.838	
	Warmth	5	.823	
	Support	5	.818	
	Reward	6	.812	
	Identity	4	.849	
Technology Acceptances toward e-learning	Performance expectancy	4	.882	.951
	Effort expectancy	4	.851	
	Attitude toward e-learning	4	.942	
	Social influence	4	.848	
	Anxiety	3	.899	
	Intention to use e-learning	3	.965	

Confirmatory Factor Analysis (CFA) was used to check the validity of a number of factors that exist in the data based on LSOCQ and UTAUT. CFA is an appropriate approach (Brown, 2006) because this research is based on the validated theory (Litwin & Stringer, 1968; Venkatesh, Morris, Davis, & Davis, 2003). Convergent validity is often used to confirm the construct validity and it can also be evaluated by examining the factor loadings and squared multiple correlations. Table 3 shows the factor loadings and squared multiple correlations. According to Hair, Anderson, Tatham, and Black (1992), a factor loading greater than 0.50 can be considered to be significant (See Table 3). The squared multiple correlations were less than .20 and, should be excluded due to the high level of errors (Hooper, Coughlan, & Mullen, 2008). The factor loadings were higher than .50 and squared multiple correlations between the individual items and their a priori factors were high. Therefore, it concluded that all factors had proper reliability and convergent validity in this study.

Table 4 shows the descriptive statistics of employees' perception of organizational climate. Structure (Mean = 4.68, SD =0.95), Warmth (Mean = 4.65, SD =1.06), and Identity (Mean = 4.74, SD =1.03) showed relatively high mean scores compared to Support (Mean = 4.35, SD = 0.98) and Reward (Mean = 4.17, SD = 1.03). In terms of employees' technology acceptances toward e-learning, attitude toward e-

learning (Mean = 4.61, SD =1.00), and intention to use (Mean =4.64, SD = 1.07) are comparatively higher than other factors, such as performance expectancy (Mean = 4.46, SD = .89), effort expectancy (Mean = 4.46, SD = 0.93), and anxiety (Mean = 3.42, SD = 1.05).

Table 3
Factor loadings and squared multiple correlations of items

Category	Item	Factor loadings	Squared multiple correlations
Organizational Climate	Structure	.869	.650
	Warmth	.855	.626
	Support	.916	.751
	Reward	.860	.660
	Identity	.816	.601
Technology Acceptances toward e-learning	Performance expectancy	.869	.765
	Effort expectancy	.808	.579
	Attitude	.910	.779
	Social influence	.824	.662
	Anxiety	-.719	.437
	Intention to use e-learning	.727	.434

Table 4
The descriptive statistics (Mean, SD, 7 Likert-scales)

Constructs/Factors		Minimum	Maximum	Mean	SD
Organizational Climate	Structure	1.00	7.00	4.68	0.95
	Warmth	1.60	6.80	4.65	1.06
	Support	1.00	7.00	4.35	0.98
	Reward	1.00	7.00	4.17	1.03
	Identity	1.00	7.00	4.74	1.03
Technology Acceptance toward e-learning	Performance expectancy	1.00	7.00	4.46	0.89
	Effort expectancy	1.00	7.00	4.46	0.93
	Attitude	1.00	7.00	4.61	1.00
	Social influence	1.00	7.00	4.57	0.93
	Anxiety	1.00	7.00	3.42	1.05
	Intention to use	1.00	7.00	4.64	1.07

4.3. Inferential statistics

The canonical correlation between employees' perceived organizational climate and their technology acceptances toward e-learning is shown in Table 5. The canonical correlation analysis (CCA) was conducted using the five organizational climate dimensions as predictors of the six employees' acceptances toward e-learning to evaluate the multivariate shared relationship between the two variable sets. The analysis yielded five functions with squared canonical correlations (Rc^2) of .534, .08, .06, .04, and .004 for each successive function. Collectively, the full model across all functions was statistically

significant using the Wilks's λ=.382 criterion, F (30, 558) = 5.06, p <.0001. Because Wilks's λ represents the variance unexplained by the model, 1- λ yields the full model effect size in an r^2 metric. Thus, for the set of five canonical functions, the r^2 type effect size was .618, which indicates that the full model explained a substantial portion, about 61.8%, of the variance shared between the variable sets.

The dimension reduction analysis allows the researcher to test the hierarchal arrangement of functions for statistical significance. As was shown, the full model was statistically significance. However, function 2, 3, 4, and 5 did not explain a statistically significant amount of shared variance between the variable sets, F (20, 465.28) = 1.39, p=0.119, F (12, 373.34) = 1.35, p = .186, F (6, 284) = 1.39, p = .220, and F (2, 143) = 0.26, p = 0.775.

Table 5
Test of canonical dimensions

Function	Canonical corr.	Squared Canonical corr.	F	Df1	Df2	p
1	0.73	0.54	5.06	30	558	<.0001***
2	0.28	0.08	1.39	20	465.28	0.1191
3	0.23	0.05	1.35	12	373.34	0.1857
4	0.23	0.05	1.39	6	284	0.2201
5	0.06	0.00	0.26	2	143	0.7745

Table 6
Standardized canonical coefficients for the variables identified in Function 1

		Function 1*			
		Coef	Structure correlation rs	rs^2	
Organizational	Warmth	0.034	0.778	60.5	
Climate	Reward	0.209	0.827	68.4	
	Structure	0.117	0.828	68.6	
	Identity	0.432	0.890	79.2	
	Support	0.348	0.917	84.09	
Rc^2					38.2
Technology	PE	0.703	0.881	77.6	
Acceptances	EE	-0.136	0.539	27.05	
toward	AT	-0.227	0.704	49.56	
e-learning	SI	0.706	0.918	84.27	
	AX	-0.026	-0.448	20.07	
	IU	-0.105	0.444		19.71

Note. Coef=standardized canonical function coefficient; rs=structure coefficient; rs^2=squared structure coefficient; Structure coefficients (rs) greater than | .45| are underlined.

Given the Rc^2 effects for each function, only the first function was considered noteworthy in the context of this study (54.0% of shared variance). The last four functions only explained 8%, 5%, 5%, and less than 1% respectively, of the remaining variance in the variable sets after the extraction of the prior function. Table 6 shows the

standardized canonical function coefficients and structure coefficients for Function 1. Function 1 reported a canonical correlation of .73 between two sets of variables. In terms of original variables' importance in predicting the identified canonical correlation (rs > 0.80), reward, structure, identity, support, performance expectancy, and social influence were found to positively contribute to the canonical correlation (Sherry & Henson, 2005).

The canonical redundancy analysis (see Table 7) shows that the first pair of canonical variables is a significant but modest overall predictor of the opposite set of variables, the proportions of variance explained being .251and .387. Redundancy analysis is used to measure how well the independent canonical variate predicts the values of the original dependent variables and how well the dependent canonical variate predicts the values of the original dependent variables (Hair, Anderson, Tatham, & Black, 1998). . Our finding shows that technology acceptance towards e-learning predicted approximately 25% of the organizational climate while perceived organizational climate predicted around 38% of the technology acceptance towards e-learning. The redundancy analysis is analogous to the multiple regressions' R^2 statistic but the interpretation of its meaning is different (Hair, Anderson, Tatham, & Black, 1998). That is, the canonical correlation variable deals with multiple dependent variables thus we cannot assume that 100% of the variance in the dependent variable set is available to be explained by the independent variable set. The set of independent variables can be predicted to account only for the shared variance in the dependent canonical variate (Hair, Anderson, Tatham, & Black, 1998).

Table 7
Redundancy analysis

Canonical Function	Standardized Variance of the technology acceptances toward e-learning explained by				
	Their own canonical variables		The opposite canonical variables		
	Percentage	Cumulative Percentage	Canonical R^2	Percentage	Cumulative Percentage
1	0.467	0.467	0.536	0.251	0.251

Canonical Function	Standardized Variance of the organizational climate explained by				
	Their own canonical variables		The opposite canonical variables		
	Percentage	Cumulative Percentage	Canonical R^2	Percentage	Cumulative Percentage
1	0.722	0.722	0.536	0.387	0.387

The squared multiple correlations indicate that the first canonical variable of the technology acceptance has some predictive power for Identity (.451), Support (.425), Structure (.324), Reward (.357), and Warmth (.368). In the meantime the first canonical variable of the organizational climate is a fairly good predictor of performance expectancy (.417) and social influence (.452), a poorer predictor of effort expectancy (.156) and attitude toward e-learning (.266), and nearly useless for predicting anxiety (.108) and intention to use e-learning (.106). See Table 8 for the tabulated data.

Table 8
The squared multiple correlations between the first canonical variable and the constructs of technology acceptance and organizational climate

Squared Multiple Correlations between the Technology Acceptance and the First M Canonical Variables of the organizational climate		Squared Multiple Correlations between the organizational climate and the First M Canonical Variables of the Technology Acceptance	
M	1	M	1
PE	0.417	Warmth	0.368
EE	0.156	Reward	0.367
AT	0.266	Structure	0.324
SI	0.452	Identity	0.451
AX	0.108	Support	0.425
IU	0.106		

5. Conclusion and discussion

The findings of this study were able to empirically substantiate previous conceptual suggestions on the relationship between organizational climate and employees' perceptions of using technologies (Kaufman, 1978; Kanter, 1983; Kozlowski & Hults, 1987). This finding is important because it demonstrates the critical role of organizational climate in promoting the use of technology so that it could be informative for a successful integration of technology in the workplace. By using the canonical correlation analysis, this study identified some significant relationships between two sets of variables. One set is to explain the level of technology acceptance (UTAUT); the other set explains the perceived organizational climate. Situated in a South Korean workplace, the results first reported a canonical correlation of .73 between two sets of variables, which suggests a strong underlying relationship between the two variable sets. In terms of the original variables' importance in predicting the identified canonical correlation, Reward, Structure, Identity, and Support from organizational climate, and Performance Expectancy, and Social Influence from UTAUT were found to positively contribute to the canonical correlation. These are variables that could significantly affect the outcomes of promoting e-learning usage by the means of improving organizational climate. On the other hand, this set of canonical variables might have less effect on the original construct variables. The finding reported that the first canonical variable of the technology acceptance has some predictive power for Identity, Support, Structure, Reward, and Warmth. The first canonical variable of the organizational climate is a fairly good predictor of performance expectancy and social influence, a poorer predictor for effort expectancy and attitude toward e-learning, and nearly useless for predicting anxiety and intention to use e-learning. In other words, by only focusing on the canonical correlation variables is insufficient to either increase the level of e-learning acceptance or to improve the perceived organizational climate.

The above results are supported by several previous research studies. Several researchers (Davenport & Prusak, 1998; Gold, Malhotra, & Segars, 2001) conceptually suggested organizational climate influences employees' learning and knowledge sharing. Beier and Kanfer (2009) demonstrated that organizational climate is one of the most

important factors that facilitates and supports e-learning. Janz and Prasarnphanich (2003) empirically revealed that the organizational climate influences cooperative learning, which is e-learning system in South Korea. However, the canonical redundancy analysis shows that the first pair of canonical variables is not a good overall predictor of the opposite set of variables, the proportions of variance explained being .251 and .387, even though previous studies indicated that organizational support significantly affected the successful implementation of e-learning in the workplace (Selim, 2007). Lin (2007) also reported that organizational factors, top management support, and organizational rewards significantly influenced the process of knowledge sharing.

To conclude, the empirical results of this study strongly suggest that HRD professionals have to consider how to influence their employees' acceptances towards e-learning in the context of organizational climate in order to promote the utilization of e-learning in the workplace. In the meantime, HRD professionals should also consider the effects of e-learning acceptance on the perceptions of organizational climate. The identified canonical variables would be helpful for HRD staff to focus their efforts on a small set of variables in order to promote e-learning through organizational means, and vice versa. As a result, employees in the workplace would be better served as e-learning could be adjusted to cater to their acceptances towards e-learning and to improve the organizational climate for better work performance.

6. Limitations and future studies

This study has several limitations. First, this study was conducted in only one company. The findings can only indicate the relationship between organizational climate perception and the acceptance towards e-learning within the studied organization. Findings are based on the perceptions of employees who voluntarily chose to respond to the questionnaire. Therefore, participants may not be representative of all the employees in the company. In addition, the data were collected through a self-reporting mechanism, as opposed to direct observation. Given the small sample size, it is inadequate to generalize our findings within this limited scope. The preliminary results, however, offer potential research directions to continuously improve the study in the future. Another limitation of this study would be to examine the time data were collected from the company because this data were collected in a specific time (September to October, 2010). Consequently, it is not apparent that in other time periods employees' perception of organizational climate and their acceptances towards e-learning would be the same. The food service industry has a high turnover rate, so different times may affect the findings. Therefore, further studies need to be done to analyze longitudinal data.

In sum, the results of this study have contributed to the extant research in several ways. Previous research showed the relationships between organizational climate and Human Resource Management issues such as job satisfaction, turnover rates, and engagement (Hunt & Ivergard, 2007; Luthans, Norman, Avolio, & Avey 2008; Patterson, 2005; Settles, Cortina, Malley, & Stewart, 2006). Recently, some research explored the relationships between organizational climate and HRD issues, such as training transfer, knowledge management, knowledge sharing and technologies innovation (Abbey & Dickson, 1983; Lim 2007; Lin, 2007; Stafyla, 2000). However, research rarely deals with organizational climate and the acceptance towards e-learning. The findings of this study demonstrated the relationships between organizational climate and the acceptances of employees towards e-learning empirically. To promote the utilization of e-learning in the

workplace, the organizational climate for improving strategies need to be considered by HRD staff.

Different organizations may have different organizational climates and it may result in differences in e-learning acceptance levels. In addition, employees may perceive different organizational climate based on their gender, positions, and professional experiences in the industry, even though they work in the same company. The empirical effects of these demographic variables, however, are beyond the scope of this study.

For future research, different organizations in various business industries should be included in the sample to examine the impact of organizational climate on employees' technology acceptance towards e-learning. Various demographic variables might take a look at for promote the utilization of e-learning in the workplace. A global organization might as well take cultural factors fully into account when developing and implementing e-learning (Nathan, 2010).

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