The Dimensions of Learning Organization Questionnaire (DLOQ): A Validation Study in a Korean Context

Ji Hoon Song, Baek-Kyoo (Brian) Joo, and Thomas J. Chermack

The purpose of this study is to assess the validity and reliability of the measurement scores of the learning organization culture, the Dimensions of Learning Organization Questionnaire (DLOQ), in a Korean context. A total of 1,529 cases from 11 firms in two major Korean conglomerates were analyzed. Rigorous translation procedures, including both forward and backward processes, have been applied to ensure the relevance of this instrumentation in different cultural contexts. As the results of confirmatory factor analysis, simple item-internal consistency estimates, and item intercorrelation analysis show, the Korean version of the DLOQ has produced reliable measurement scores with a construct validity adequate to measure the learning organization culture in the Korean context.

To survive and thrive in a world characterized by turbulent change and fierce competition due to technological advancement and the knowledge-based economy (Dodgson, 1993; Kim & Mauborgne, 2005; Joo, 2007), an organization must always be ready to adapt. Thus many organizations strive to have a learning organization culture of creating, acquiring, and transferring knowledge and modifying its behavior to reflect new knowledge and insights (Garvin, 1993).

There has been growing awareness of the importance of individual knowledge, or human capital, created in an organization that plays a key role in

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many functions (Drucker, 1992; Thurow, 2003; von Krogh, Ichijo, & Nonaka, 2000). However, human capital cannot be created in a vacuum. The spark is indispensable, but without air there can be no flame. Likewise, human capital is contingent on learning organization culture and organizational learning process. Without such a culture supporting learning in the organization, the efforts invested in individual learning and development would not produce the expected outcomes (Joo & Yang, 2007). Thus organizations have an incentive to create an environment conducive to high individual learning and development by encouraging organizational learning culture.

The concept of the learning organization culture and the organizational learning process has received increasing attention in the fields of human resource development (HRD) and organization development (OD). One of the most critical issues, however, has been the lack of practical and validated measurement tools (Holton, Bates, & Ruona, 2000; Lim & Morris, 2006; Yang, Watkins, & Marsick, 2004). As a matter of fact, little has been known about how to adequately measure the learning organization culture as a supportive system for organizational learning process until the dimensions of learning organization questionnaire (DLOQ) came into being (Yang et al., 2004). For an instrument to be generalizable, it needs to be assessed in various cultural settings. There have been studies of the validation of the DLOQ in the contexts of the United States, Colombia, China, and Taiwan (Ellinger, Ellinger, Yang & Howton, 2002; Hernandez, 2000; Lien, Hung, Yang, & Li, 2006; Yang et al., 2004; Zhang, Zhang, & Yang, 2004) to verify its applicability in different cultures.

Although Korea has little in terms of natural resources, it has the most important resource: human capital. Thanks to human capital and investment in education, Korea has achieved one of the highest rates of economic growth in the world in the past several decades. However, to meet challenges such as globalization, technology advancement, and the knowledge-based economy, learning at the individual level will not suffice. Thus the priority of most large Korean companies has been on transforming organizational culture as well as the individual performance management system. More specifically, since the early 1990s a number of Korean organizations have competitively introduced the concept of the learning organization as an ideal model that could allow collaborative learning to occur continuously (Yoo, 2005).

Even though Korean companies have focused enormous effort on planning and implementing various strategic choices to become learning organizations, it has not been an easy task to measure how successful the process and the outcomes of their efforts have been. Organizational learning in the international context needs indigenous research, a type of design in which the researchers focus their attention on identifying and uncovering unique organizational learning enhancing or restraining factors that are embedded in a non-Western context. This research is one such effort to respond to this issue. One of the most critical issues for Korean organizations
is to have culturally and systematically acceptable measurement tools to evaluate their status in the individual's learning process, team-based approach, and system-related organizational structure. From this perspective, the DLOQ would be the suitable measurement tool to assess learning organization climate and organizational learning processes. As mentioned above, however, because organizational learning theories and learning organization models are developed primarily in Western cultures, there has been increasing need for validated measurement of the learning organization culture in Korean context. There have been several studies using the DLOQ in the Korean culture (Joo, 2007; Lim, 2003), but no such effort for validation of the DLOQ in the Korean context has been made. We believe this study can respond to the issue.

The purpose of this research is to assess the validity and applicability of the DLOQ in a Korean cultural context. In this way, survey questions are able to measure the intended characteristics accurately and consistently given a different cultural context from that in which they may have been developed. Therefore, the research question for this inquiry was, Is the Dimensions of Learning Organization Questionnaire (DLOQ) developed by Watkins and Marsick (1996) an appropriate measure of the learning organization climate in Korean business organizations?

**Literature Review**

To address the suggested research question, two realms of literature were reviewed: the concept of the learning organization and the distinction between learning organization and organizational learning.

**The Concept of Learning Organization.** The concept of the learning organization is an increasing area of interest in the fields of HRD, management, and even school systems (Egan, Yang, & Bartlett, 2004; Marquardt, 1996, 2002; Wang, Yang, & McLean, 2007). Interest in the learning organization as the source of organizational success and competitive advantage has been a strong focus in these fields in past decades (Ellinger et al., 2002; Gilley & Maycunich, 2000; Leonard, 1998; Tsang, 1997). Three efforts have been hailed as landmark works on the learning organization: Organizational Learning: A Theory of Action Perspective Reading (Argyris & Schön, 1978); The Fifth Discipline: The Art & Practice of the Learning Organization (Senge, 1990); and Sculpting the Learning Organization: Lessons in the Art and Science of Systematic Change (Watkins & Marsick, 1993).

Argyris and Schön (1977, 1978, 1996) proposed the concept of double loop learning and theories-in-use based on the reflective organizational learning process. With regard to organizational learning, they stressed the supremacy of collective learning and the continuous reflection process in order to achieve high performance in an organization. The focus on the continuous and collaborative learning practice became the groundwork of the concept of the learning organization. In brief, it placed more emphasis
on the process-oriented concept (*organizational learning*) that underpins the learning practices that could occur in all the entities of an organization.

Senge (1990) modified the basic assumptions about the learning organization by proposing a *fifth discipline*, consisting of five fundamental elements for the successful learning organization: (1) systems thinking, (2) personal mastery, (3) mental models, (4) shared vision, and (5) team learning. Senge (1990) defined the learning organization as the “organization that is continuously expanding its capacity to create its future” (p. 14). Furthermore, he insisted that the learning organization is “where people could expand their competency to lead desirable results, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are persistently learning how to learn together” (p. 3). In brief, the proposed five components are the basis of building a learning organization.

According to Watkins and Marsick (1993), the concept of the learning organization could be explained as “one that learns continuously and transforms itself. . . Learning is a continuous, strategically used process—integrated with and running parallel to work. . . Learning also enhanced organizational capacity for innovation and growth. The learning organization has embedded systems to capture and share learning” (p. 8). They focused more on the system approach regarding the workplace applications and supportive environmental factors that promote persistent learning processes.

Three commonalities were drawn from the literature study: (1) the key of the learning organization is the organizational learning process; (2) the bases of the successful learning organization are collective thinking, togetherness of people, and human competency; and (3) a learning organization is the systematic environment in which continuous learning could take place by way of connections with organizational components (e.g., Argyris & Schön, 1996; Garvin, 1993, 2000; Leonard, 1998; Senge, 1990; Watkins & Marsick, 1996). This study is theoretically based on Watkins and Marsick’s framework of the learning organization (1997), which will be elaborated later.

**Learning Organization vs. Organizational Learning.** In many cases, the terms *learning organization* and *organizational learning* are used interchangeably. However, we agree that there should be a distinction between the two concepts (Jensen, 2005). As various authors argued, “there is a growing dichotomy between the two streams of research: the learning organization stream and the organizational learning stream” (Huysman, 2000, p. 134).

Vera and Crossan (2005) defined organizational learning as the process of collective learning activities through shared thoughts and actions, which is affected by the institutionalized climate on the basis of the integrative analysis of previous literatures of Argyris and Schön (1978) and Duncan and Weiss (1979). In contrast, Senge (1990) defined a learning organization as “a place where people continually expand their capacity of creating results, where patterns of thinking are broadened and nurtured, where collective aspiration is free and where people are continually learning to learn” (p. 1).
Considering these perspectives, we view organizational learning as the collaborative learning process of individuals, and the learning organization as the nature and/or characteristics of organization that could promote continuous organizational learning process (Lahteenmaki, Toivonen, & Mattila, 2001). Organizational learning analyzes learning processes without paying much attention to the outcomes; learning organization is mainly prescriptive, linking to improvement (Huysman, 2000). Thus, whereas the learning organization has to do with the contextual mechanism that transforms external knowledge into internal knowledge, organizational learning is all about learning processes that transform local or individual knowledge into collective knowledge (Huysman, 2000).

Marsick and Watkins (2003) argued that climate and cultural aspects are built by complicated components, among them leadership, learning process, and other supportive systematic factors. To be more specific, the DLOQ contains seven dimensions of the positive nature and cultural aspects of a supportive learning organization, which encourage dynamic organizational learning process at two levels: organizational structure and people's collaborative learning. As for the theoretical framework of the DLOQ, it integrates both concepts or streams: learning organization and organizational learning. Regarding the subdimensions of the DLOQ, we believe that continuous learning, system connection, and embedded systems are closely associated with contextual mechanism, which leads to learning organization, whereas dialogue and inquiry, team learning, empowerment, and strategic leadership are more related to organizational learning process. Therefore we suggest that the DLOQ be a measure for learning organization culture, which plays a pivotal role as an antecedent for many dependent variables of HRD.

Theoretical Framework

This study is based on Watkins and Marsick’s framework of learning organization (1997): the Dimension of Learning Organization Questionnaire. First, we review the development of the DLOQ. Then, the related empirical studies on the DLOQ in different cultural settings are described. Finally, we discuss the need for this validated measurement tool for the learning organization in the Korean cultural context.

The Development of the DLOQ. One of the most severe but common critiques of HRD practices is the lack of measures to assess applications empirically in the workplace (Holton, 1996, 2005; Holton et al., 2000; Tsang, 1997; Yang et al., 2004). To date, numerous studies have been conducted to examine the substantial concept of the learning organization. However, little regard was given to how to measure the conceptualized learning organization in the workplace empirically until the 1990s.

The endeavors of Watkins and Marsick (1993, 1996, 1997) are of great importance in constructing the basic notions of the measurement factors of
the learning organization. Their approach encompassed comprehensive components of the learning organization construct; in turn, in order to define the construct of the learning organization, Watkins and Marsick provided an integrative concept of the learning organization based on three approaches: (1) for systems thinking, organizational generativity (Senge, 1990); (2) for a learning perspective, comprehensive aspects of learning (Pedler, Burgoyne, & Boydell, 1991); and (3) for strategic perspective, managerial practices (Garvin, 1993; Goh, 1998).

From a broader theoretical standpoint, Watkins and Marsick (1993, 1996, 1997) proposed the DLOQ, a constructive concept of learning organization measures that has seven dimensions of learning-related factors in both people-oriented and structure-oriented components. The model of an effective learning organization is considered one that has the capability to integrate people and organizational structures in order to facilitate continuous learning and encourage organizational changes (Yang et al., 2004). Through integration of the aforementioned dimensions of the learning organization, Watkins and Marsick (1997) proposed an integrated model. The specific seven dimensions of a learning organization culture are described here in Table 1.

### Table 1. Watkins and Marsick’s Model (1997) of the Seven Dimensions of the Learning Organization

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<th>Dimension</th>
<th>Description</th>
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<tr>
<td>Continuous learning</td>
<td>Opportunities for ongoing education and growth are provided; learning is designed into work so that people can learn on the job.</td>
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<tr>
<td>Inquiry and dialogue</td>
<td>The organizational culture supports questioning, feedback, and experimentation; people gain productive reasoning skills to express their views and the capacity to listen and inquire into the views of others.</td>
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<tr>
<td>Team learning</td>
<td>Work is designed to use teams to access different modes of thinking; collaboration is valued by the culture and rewarded; teams are expected to learn by working together.</td>
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<tr>
<td>Embedded system</td>
<td>Necessary systems to share learning are created, maintained, and integrated with work; employees have access to these high- and low-technology systems.</td>
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<tr>
<td>Empowerment</td>
<td>People are involved in setting and implementing a shared vision; responsibility is distributed so that people are motivated to learn what they are held accountable to do.</td>
</tr>
<tr>
<td>System connection</td>
<td>The organization is linked to its communities; people understand the overall environment and use information to adjust work practices; people are helped to see the effect of their work on the entire organization.</td>
</tr>
<tr>
<td>Strategic leadership</td>
<td>Leadership uses learning strategically for business results; leaders model, champion, and support learning.</td>
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The original version of the DLOQ consisted of 43 items to measure the seven dimensions; later on, throughout empirical validation of the instruments, Yang et al. (2004) refined the DLOQ and fabricated an abbreviated version of it, which consisted of 21 items that did not depreciate the original theoretical structure.

From the given approaches, through empirical validation procedures, the abbreviated version of the DLOQ has been assimilated as an instrument applicable to measuring the concept of the learning organization (Yang et al., 2004). Furthermore, to emphasize practical applications in actual organization settings, 12 items have been added for measuring the level of performance improvement in both financial and knowledge domains. Consequently, an instrument that consists of seven dimensions of the learning organization and two measures of performance improvement was developed in two forms (43 items and 21 items) and was named DLOQ: Dimensions of the Learning Organization Questionnaires (Yang et al., 2004).

Validation Studies of the DLOQ. To date, several studies have been done to examine the validity and reliability of measures of the learning organization in several cultural contexts: the United States, Colombia, China, and Taiwan (Ellinger et al., 2002; Lien et al., 2006; Yang et al., 2004; Zhang et al., 2004; Hernandez, 2000). The results of these studies have verified the applicability of the DLOQ in different cultures, providing internal consistency of each item’s reliability (coefficient alpha range from .71 to .91) and reliable factor structure of the dimensions of the learning organization (Lien et al., 2006).

Furthermore, several types of subjects have participated in research with the DLOQ, to address applicability to the overall organizational circumstances that lend valid factor constructs of measures including leadership, organizational commitment, organizational creativity, job satisfaction, learning transfer, and so on, in both educational and business settings, both profit and nonprofit (Hernandez, 2000; Joo, 2007; Lim, 2003; McHargue, 1999; Wang, 2005).

Table 2 summarizes the cross-cultural validation studies in terms of the scale reliability of the measurement items. The comparison of the item internal consistency estimates of cross-cultural studies revealed useful suggestions for further revision on the developing Korean version of the DLOQ. The reliability estimates for Team Learning ($\alpha = .78$) and System Connection ($\alpha = .79$) were slightly lower than those in most of the previous studies. Even though more careful examination of item-by-item analysis was included, no particularly inadequate subitems were found. Those results may be due to the differences of culture or contextual understanding of the translated questionnaires. However, those slightly lower coefficient estimates could not decrease the overall reliability of the scales ($\alpha$ ranges from .74 to .84, and overall $\alpha = .95$, respectively).

The Need for the Validated DLOQ in Korea. Since the early 1990s, Korean society has undergone enormous changes. Human resources (HR) is...
one of the areas that have experienced dramatic change. For example, the traditional HR system in Korea focused on cultivating long-term loyalty and organizational attachment on the part of employees by providing job security and various seniority-based HR policies (Yu, Park, & Kim, 2001). However, globalization, fierce international competition, and economic distress—especially the 1997 international monetary fund (IMF) bailout—demanded more efficient and flexible human resources with lower labor costs. In such a situation, many organizations in Korea introduced so-called best practices to HR policies, mainly based on the U.S. practices (Bae & Rowley, 2001). Since 1997, a number of large organizations in the private sector have tried to promote various change efforts such as downsizing, restructurings, mergers and acquisitions, changing business strategies, and cultural transformations. One of them was the concept of the learning organization, which later transitioned into knowledge management.

Korean companies eventually began to introduce more strategic applications of the learning organization (Song, 2000; Yoo, 2005). Korean organizations had a critical need to catch up with global and innovative economic trends, specifically regarding the strategic implications of the learning organization for practical continuous learning (Kim, 1997, 1998; Yoo, 2005). Furthermore, Korean organizations needed to learn how to link learning practices with continuous performance improvement (Song, 1999, 2000).

Because Korean organizations have their own cultures and hierarchical decision-making structures, applications of numerous types of measurement tools in the Korean context without strict processes of validation have the potential of producing negative side effects (Jang, Kim, & Kim, 2001; Sin, O, & Park, 1999; Song, 2000). Some even argued that application of learning

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<tbody>
<tr>
<td>Continuous Learning</td>
<td>.74</td>
<td>.80</td>
<td>.72</td>
<td>.80</td>
<td>.79</td>
<td>.81</td>
</tr>
<tr>
<td>Inquiry &amp; Dialogue</td>
<td>.80</td>
<td>.78</td>
<td>.89</td>
<td>.81</td>
<td>.85</td>
<td>.86</td>
</tr>
<tr>
<td>Team Learning</td>
<td>.78</td>
<td>.78</td>
<td>.86</td>
<td>.79</td>
<td>.84</td>
<td>.85</td>
</tr>
<tr>
<td>Embedded System</td>
<td>.76</td>
<td>.82</td>
<td>.71</td>
<td>.81</td>
<td>.80</td>
<td>.85</td>
</tr>
<tr>
<td>Empowerment</td>
<td>.78</td>
<td>.82</td>
<td>.75</td>
<td>.81</td>
<td>.75</td>
<td>.84</td>
</tr>
<tr>
<td>System Connection</td>
<td>.79</td>
<td>.84</td>
<td>.89</td>
<td>.80</td>
<td>.82</td>
<td>.87</td>
</tr>
<tr>
<td>Providing Leadership</td>
<td>.84</td>
<td>.85</td>
<td>.91</td>
<td>.84</td>
<td>.86</td>
<td>.89</td>
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Table 2. Summary of the Scale Reliability Estimates of the Previous Validation Studies
organization approaches to many Korean organizations failed because of the absence of culturally validated instruments and the unconditional introduction of Western best practices (Jang et al., 2001; Yoo, 2005). From an academic perspective, even though several studies on the concept of the learning organization and application of the DLOQ have been conducted in Korea, only a few have resulted in structural validation processes to measure acceptability and applicability of the instruments in the Korean culture (Joo, 2007; Lim, 2003).

This study can therefore contribute to the organizational learning research in Korea by examining the validity and reliability of the DLOQ as well as the applicability of the instrument in a Korean cultural context. We believe that the results of this study will be beneficial for many Korean organizations in successfully applying learning organization strategies with standardized measures of the learning organization characteristics.

Methods

In this section, we first describe sample and data collection procedures. Then we elaborate information about the instrument and translation procedure. Finally, we briefly discuss the analytical strategy.

Sample and Data Collection. We chose two Korean conglomerates that have invested a huge amount of time and effort in the learning organization and organizational learning. That is, the two are known as exemplary organizations for learning organizations in the Korean context, with a number of best practices. The two conglomerates have more than 20 subsidiaries, representing diverse industries: electronics, telecommunication, IT solutions, construction, heavy industry, oil and gas, chemical, international trading, insurance, and finance. Three among them were Fortune Global 500 companies.

We approached two senior managers in the HR headquarters and strategic planning offices of each conglomerate. The managers suggested five and six subsidiaries for the sampling. Selection of the respondents was based on the experience of learning organization interventions and the level of understanding about the concept of learning organization cultural aspects of selected organizations. As alternative methods for data collection, Internet- and intranet-based surveys were used as well. As a result, approximately 5,000 employees were randomly selected and received an invitation letter via company e-mail. Approximately 3,000 employees who indicated their intention to participate received survey questionnaires. A total of 1,545 participants finally served as voluntary participants. Through an appropriate data screening process, 16 incomplete cases and extreme outliers were deleted. Consequently, we collected 1,529 completed cases from 11 for-profit organizations. Therefore, the response rate was approximately 33%.

With regard to sample size, Kline (2005) suggested that determination could be considered on the basis of the ratio of cases to free parameters.
(10:1 or, even better, 20:1). Bentler and Chou (1987) also suggested that the sample-to-parameters ratio for structural equation modeling should be between 5:1 and 10:1. Because the rate in this study was 73:1, which is well over the guideline, there is no potential issue regarding the number of participants. As a matter of fact, this study has the largest sample among validation studies of the DLOQ. As for the missing data treatment, a complete case approach was used, based on listwise deletion (Hair, Black, Babin, Anderson, & Tatham, 2006). Because this study has used a comparably large number of cases, a complete case approach could be acceptable, showing little bias of chi-square (Hair et al., 2006).

Regarding the sample frame, almost 87% were male, indicating masculine dominance in Korean organizations. In terms of position levels, approximately 32% were senior managers or higher, almost 53% were middle managers, and the remaining 15% were nonmanagers. As for the type of job or function, approximately 25% were in R&D functions, another 25% were in general or supporting management functions (which include planning, human resources, finance, and so forth), and 21% were in marketing and sales. In terms of the industry, approximately 62% were in electronic, IT, and communication-related areas; 18% were in finance and trading businesses; and 17% were in oil and gas, chemical, and heavy industrial areas. We assume that this diversity of the collected data in terms of the positions of the participants, functions of work, and types of business could grant general reliability to the sample selection procedures.

**Instrumentation.** For the current research, the abbreviated 21-item DLOQ was validated in terms of item internal consistency and psychometric properties of the constructs from the data collected in Korean for-profit organizations. The rationale for using the shortened version of the DLOQ came from the empirical literature in terms of the goodness-of-fit-index (Ellinger et al., 2002; Lien et al., 2006; Yang et al., 2004). The seven dimensions of the DLOQ were measured with 21 items on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree).

The first version of the Korean DLOQ was translated using literal combinations of two doctoral dissertations of Korean colleagues and one conference research article (Joo, 2007; Lim, 2003). The DLOQ (Watkins & Marsick, 1997) has been adapted and translated into Korean through the four steps of scrupulous translation: forward translation, assessment, backward translation, and assessment based on the criteria of clarity, common language, and cultural adequacy (Harkness, van de Vijver, & Mohler, 2003; Presser, Rothgeb, Couper, Lessler, Martin, & Singer, 2004).

More specifically, the translation process is as follows. First, to ensure face validity for the DLOQ within the Korean context, three experts (one practitioner and two academics) in the Korean HRD field reviewed the instrument in English. These experts offered suggestions for refinement of statements and for format of the survey instrument. In addition, to ensure validity in
the process of translation, the researcher had a bilingual expert translate this section of the instrument and the instructions into Korean, and another bilingual expert translated it back into English to establish accurate translation of the questionnaire. Differences were reviewed, and inappropriate Korean wordings and translations were revised.

**Data Analysis Technique.** The primary concern of this research was assessing the applicability of the DLOQ to the Korean cultural context. Whereas explorative factor analysis (EFA) is used to explore underlying factors when there is little previous theoretical guidance for a domain of interest, confirmatory factor analysis (CFA) is used to confirm or disconfirm a hypothesized factor structure of interest (Yang, 2005). Because a number of studies have already used the DLOQ, this validation study is based on CFA and reliability tests as for the analysis techniques. As suggested by Hinkin (2005), following the CFA descriptive statistics, correlations, and reliabilities were conducted. Data analyses were performed with SPSS 16.0 and LISREL 8.80.

First, a CFA was employed to examine validity and applicability of the hypothesized constructs of measurement in the Korean culture. According to Kline (2005), “the technique of CFA analyzes a priori measurement models in which both the number of factors and their correspondence to the indicators are explicitly specified” (p. 71). Analysis of CFA is the appropriate method to validate the hypothesized measurement for three reasons: (1) measurement of the DLOQ has been developed on a theoretical basis; (2) it verifies the adequacy of the item-to-factor associations; and (3) it examines the construct validity of theoretically proposed measurement (Hair et al., 2006; Yang et al., 2004; Thompson, 2004; Thompson & Daniel, 1996). Second, to assess item internal consistency, zero-order correlation analysis and scale reliability tests were used. Item intercorrelation and Cronbach’s coefficient alpha estimations are the initial steps to examine the proposed items’ reliability in terms of internal consistency of the measures (Yang et al., 2004).

This study included perceptions of influence at several levels: organizational, group, and individual. Thus, there can be a concern about what self-report responses on perceptions of the contextual characteristics really measure. That is, one of the potential issues in this study is the unit of analysis. However, what matter are the perceptions themselves and their relation to organizational learning and learning organization. Like much social science research, we believe the levels of analysis for some subdimensions in this study can be justified in that it is the psychological meaning of environmental events that largely influences individual behavior (Amabile, 1996; Woodman, Sawyer, & Griffin, 1993).

**Results**

To ensure that theoretical measurement of the learning organization is valid and reliable in the Korean context, several analyses were conducted. In order
to underpin the given research purpose, several CFAs were conducted to examine construct validity of the proposed measurement. In addition, various assumptions, among them normal distribution, general item internal consistency, and item internal correlation, were positively identified.

**Confirmatory Factor Analysis.** To confirm the construct validity of the Korean version of the DLOQ, first CFA was used. To examine the level of the goodness-of-fit of the specified measurement model, several measurement indices were interpreted. The absolute fit measures included chi-square ($\chi^2$), the most fundamental absolute fit index, which is respectively sensitive to sample size; Jöreskog & Sörbom’s goodness-of-fit index or GFI (2001), which is less sensitive to sample size; adjusted goodness-of-fit (AGFI), which tries to take into account differing degrees of model complexity (Hair et al., 2006); Jöreskog & Sörbom’s root mean square residual or RMR (2001), which measures an average of the residuals between individual observed and estimated covariance and variance terms; and Steiger’s root mean square error of approximation (RMSEA; 1990), which represents the model fit in a population. The incremental fit indices were Bentler’s comparative fit index or CFI (1990), which measures the degree of fit between the hypothesized and null measurement; and Bentler and Bonett’s nonnormed fit index or NNFI (1980), which is the relative fit index that compares the model being tested to a null measurement.

The hypothesized measurement model of the DLOQ has seven dimensions consisting of 21 subitems, and in turn those seven dimensions represent the single circumstance of the learning organization culture. From a statistical standpoint, this means that the DLOQ is a second-order factor structure that contains two layers of latent construct (Hair et al., 2006). Thus two separate simple CFA and a higher-order CFA were analyzed (see Table 3).

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<tr>
<td>$\chi^2$(df)</td>
<td>920.13 (168)</td>
<td>632.57 (167)</td>
<td>830.21 (168)</td>
<td>2031.88(778)/2746.29 (778)</td>
<td>328.54 (157)</td>
</tr>
<tr>
<td>RMSEA</td>
<td>.054</td>
<td>.077</td>
<td>.076</td>
<td>.06/.08</td>
<td>.073</td>
</tr>
<tr>
<td>RMR</td>
<td>.023</td>
<td>.056</td>
<td>.042</td>
<td>.05/.06</td>
<td>.053</td>
</tr>
<tr>
<td>GFI</td>
<td>.95</td>
<td>.89</td>
<td>.89</td>
<td>.82/.75</td>
<td>.87</td>
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<tr>
<td>AGFI</td>
<td>.93</td>
<td>.85</td>
<td>.85</td>
<td>.79/.71</td>
<td>.81</td>
</tr>
<tr>
<td>NNFI (TLI)</td>
<td>.99</td>
<td>.85</td>
<td>.92</td>
<td>.87/.81</td>
<td>.91</td>
</tr>
<tr>
<td>CFI</td>
<td>.99</td>
<td>.88</td>
<td>.93</td>
<td>.88/.83</td>
<td>.94</td>
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Note: RMSEA = root mean square error of approximation; RMR = root mean square residual; GFI = goodness-of-fit index; AGFI = adjusted GFI; NNFI = nonnormed fit index; CFI = comparative fit index.
First, the chi square ($\chi^2$ (1529) = 920.13/1189.85) of both CFAs was statistically significant ($p < .001$), confirming the lack of a close model fit with the data. Nevertheless, these results were not pervasive in the current research, because chi square analysis is sensitive to sample size (Hair et al., 2006; Yang et al., 2004). Holistic evaluation of the model fit of the measurement needs to consider other several model fit indices. Table 4 indicates that the Korean measurement model of the DLOQ demonstrated a better fit to the data in all indices, compared with the results in other studies.

Figure 1 shows the factor loadings as a result of CFA. For the first-order CFA, all estimates of comparative fit indices (GFI, AGFI, CFI, NNFI) were well above .93, indicating a statistically significant data-model fit. Furthermore, in terms of the general model fit, a great portion of the covariance and variance of the learning organization culture in the Korean context could be represented by the proposed seven dimensions of the DLOQ (GFI = .95). Moreover, the small magnitude of residuals (RMR = .023, RMSEA = .054) also indicated an appropriate model-data fit. With regard to these fit statistics, more evidence of construct validity in a Korean cultural context has been provided.

Thus, this research confirmed that the DLOQ produces a reliable and valid measure in the Korean cultural setting and that the cultural differences between the United States and Korea do not seem to affect accuracy or consistency. The results of the higher-order CFA, furthermore, produced a statistically acceptable model fit (RMR = .026; RMSEA = .060; GFI = .93; CFI = .99) as well. These results hold that the seven dimensions of the DLOQ are a one-factor structure measuring the learning organization culture in the Korean context.

Finally, the factor loadings of each item on the seven dimensions lent supplemental evidence of the measurement model fit of the DLOQ in the Korean context. All factor loadings of each item of the DLOQ on the seven dimensions were greater than .67. Thus these factor loadings also indicate that the translated version of DLOQ is a valid and applicable measurement in the Korean context.

In addition, to improve the reliability of the previous CFA analysis, data were categorized according to their demographic nature.
and unit of business). Then separate CFA analyses were conducted. This approach may increase a certain level of reliability of the construct validation of the DLOQ in the Korean context.

First of all, four models were tested according to the four levels of participant position (nonmanager-level employees, associate and middle managers, senior managers, and executive managers). Based on the results of separate CFA analyses (see Table 5), regardless of participant position in the organization, the DLOQ was found to be an applicable and valid concept in terms of the construct validity.

Second, separate CFAs were considered to compare the model fit to data depending on type of business unit (see Table 6). Although all of the
models showed a fairly acceptable level of model fit to the data, IT and communication-related business units demonstrated a bit higher error variance in terms of the RMSEA and RMR. We suppose that this phenomenon could result from the independent nature of job characteristics of the IT-oriented employees. However, further research is needed to investigate the specific characteristics of each business unit.

Descriptive Statistics, Correlations, and Reliabilities. According to the central limit theorem, the collected data could be assumed to have a normally distributed shape (Urdan, 2005). The collected 1,529 cases were larger than any sample in other validation studies. Furthermore, the variance inflation factor (VIF) shows that there is no severe multicollinearity among the collected data for the seven dimensions (VIF ranges from 2.43 to 2.98; Kutner, Nachtsheim, & Neter, 2004).

All of the correlation coefficients were statistically significant \( (p < .001) \). According to Yang et al. (2004), significantly correlated factors suggest the satisfied convergent validity of the hypothesized measures, ranging from .59 to .73. No extremely high correlation coefficients, which might result in the constraints of factor discrimination, were found among the subfactors (Byrne, 1998; Hair et al., 2006; Kline, 2005). In addition, Cronbach’s coefficient alphas were reasonably acceptable, ranging from .74 to .84 (see Table 7). According to those initial steps for examination of item reliabilities, the overall reliability estimates were satisfactory (Yang et al., 2004).

In summary, according to separate CFA analyses from the nature of demographic information, the DLOQ is a fairly acceptable fit to the data and
has construct validity in the Korean context. These results underpin overall applicability of the Korean version of the DLOQ.

Discussion

The findings of this study and the implications for research and practice in the field of HRD are discussed. Then we identify the limitations of this study and make recommendations for future research. Finally, some conclusions follow.

Theoretical Implications. This study found that, in terms of rigor and relevance, the shortened 21-item DLOQ is an appropriate measure for learning organization culture in Korean context. The theoretical implication is that this is the first study validating the DLOQ in Korean context, integrating previous studies. In addition, this research serves as evidence establishing further generalizability and robustness for the DLOQ itself. From a theory development perspective, we also argue that this research contributes to the growing body of assessments that generally indicate the overall accuracy and validity of the theory of the learning organization developed by Watkins and Marsick (1996). That is, the DLOQ is gaining evidence in a variety of contexts that confirm its measurement accuracy and validity. Using Lynham’s general method of theory building in applied disciplines (2002), the DLOQ is one of the rare examples that a theory has been conceptually developed, operationalized, confirmed, and applied in the discipline of HRD.

Implications to the Practices of HRD. As for practical implications, this research would enable the theory of the learning organization or organizational learning to be applied in HRD practices. The primary goal of establishing the reliability and validity of the measure from an academic standpoint is that the measure should be used in practice with confidence that the practice is based on sound theory. The results of this study indicate that the DLOQ is a useful measure of perceived learning organization characteristics in Korean organizations.

Table 7. Descriptive Statistics, Correlations, and Reliabilities

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Continuous Learning</td>
<td>3.68</td>
<td>.72</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(.74)</td>
</tr>
<tr>
<td>2. Inquiry &amp; Dialogue</td>
<td>3.70</td>
<td>.72</td>
<td>.69**</td>
<td>(.80)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Team Learning</td>
<td>3.65</td>
<td>.75</td>
<td>.62**</td>
<td>.72**</td>
<td>(.78)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Embedded System</td>
<td>3.61</td>
<td>.73</td>
<td>.65**</td>
<td>.66**</td>
<td>.69**</td>
<td>(.76)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Empowerment</td>
<td>3.55</td>
<td>.73</td>
<td>.61**</td>
<td>.65**</td>
<td>.71**</td>
<td>.69**</td>
<td>(.78)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. System Connection</td>
<td>3.75</td>
<td>.72</td>
<td>.62**</td>
<td>.59**</td>
<td>.65**</td>
<td>.62**</td>
<td>.66**</td>
<td>(.79)</td>
<td></td>
</tr>
<tr>
<td>7. Providing Leadership</td>
<td>3.76</td>
<td>.74</td>
<td>.65**</td>
<td>.66**</td>
<td>.67**</td>
<td>.65**</td>
<td>.66**</td>
<td>.73**</td>
<td>(.84)</td>
</tr>
</tbody>
</table>

Note: n = 1529; **p < .001; Internal consistency estimates are presented in the diagonal.
This indicates that the DLOQ is an appropriate tool for a quick snapshot of learning organization culture. For instance, HRD professionals in Korean organizations can use the DLOQ to assess the learning culture of an organization as part of their organizational analysis before implementing an organizational change effort.

Although no instances of severe multicollinearity were found among the subdimensions (Byrne, 1998; Hair et al., 2006; Kline, 2005), the correlation coefficients were similar, ranging from .59 to .73. Cronbach's coefficient alphas were reasonably acceptable, ranging from .74 to .84. It may be difficult to analyze not only the relationships among the subdimensions of the DLOQ but also the relationships between the subdimensions and other variables. Thus it is an imperative issue to increase the utility of the DLOQ.

This study has successfully validated the Korean version of the DLOQ, but some previous studies (Egan, 2005; Joo, 2007) reported a nonpositive definite matrix when there is a relatively small sample \( (n < 250) \). As suggested by Yang (2005) and Marsick and Watkins (2003), therefore, instead of the 21-item model a unidimensional 7-item model that represents each subconstruct could be an alternative choice. In this way, the measurement model could have a better fit to relatively limited data, satisfying the sample-to-parameter ratio (5:1 to 10:1) and increasing the utility of the measure.

**Limitations.** In terms of methodology, this study has several potential limitations. First, the study relies on self-reported and reflective recollection of the indicators of the constructs in this study by employees who volunteered their participation. Because of the perceptual nature of the data, there is the possibility of a percept-percept bias. Second, this empirical study confines itself to a cross-sectional survey method, which leaves room for speculation with regard to causality among the variables. Longitudinal research would substantiate the conclusions of this study. In addition, the sample of this study, consisting mostly of highly educated male managers in a large organization, is likely restricted to a certain group with similar demographic characteristics (males of relatively high cognitive ability, or employees in a small organization). Last, as discussed earlier, there can be a concern about the unit of analysis issue. Though some subdimensions (continuous learning, system connection, and embedded system) are organization-level, others (team learning, empowerment, and dialogue and inquiry) are group-level.

**Recommendations for Future Research.** As mentioned in the previous sections, time and effort have been put into developing reliable instruments to measure effective learning organization climate. This research focused on the DLOQ, which considered both individual and group-level learning process and systematic organizational structure. Many critical points in terms of the reliability and construct validity of the DLOQ have been positively defined in the Korean context. However, to assess more comprehensive applicability of the DLOQ in various contexts, a multiple-aspect-oriented approach needs
to be considered. As one of the examples, the Multi-Traits-Multi-Method (MTMM) approach could be implied by the cross-culturally collected data for more solid evaluation on psychometric consistency and cross-culturally acceptable construct validity.

In addition, as one of the limitations of this research, we collected data from fairly large organizations, with more than 1,000 employees. However, even small or medium-size organizations may have experienced some features of a learning organization climate in their own way, although it has not been publicized or officially recognized. For future research, more in-depth investigation on the activities and efforts of small and medium-size organizations’ learning organization climate should be considered, which could present a blinded chance for benchmarking; comparison research on the types of activities and perceptual differences depending on the size of the organization could pull out practical, interesting, and worthy results. In line with this, qualitative studies that actually consider indigenous perspectives rather than simply translations of Western concepts should be deemed an additional way forward.

Finally, the use of the DLOQ is confined to four HRD journals. Little research using the DLOQ has been found in management or organizational psychology journals. It is hoped that more research with rigor and relevance would make this instrument more prevalent in diverse fields of research.

**Conclusion.** Traditionally, human resource development (HRD) has mainly focused on individual training: “HRD practitioners need to pay more attention to employee development programs, such as on-the-job experience, coaching, mentoring, management development, and career development” (Joo & McLean, 2006, p. 253). That is, greater emphasis is needed on organizational learning and development, which includes organizational culture transformation and change management. Thus organizational learning culture plays an important role as an antecedent for many dependent variables of HRD: learning, performance, satisfaction, change, creativity, productivity, and effectiveness (Joo, 2007).

We have found that the DLOQ is a valid and reliable measure of perceptions of learning organization culture in Korean organizations. Next steps will involve linking the perceptions of that culture to some of the dependent variables we have mentioned, such as performance, satisfaction, change, productivity, and effectiveness to name a few. These will be complex studies, no doubt, but what we are poised to learn about the relationships between learning culture and these dependent variables is exciting for organizational researchers indeed.

Research such as this reflects the fact that the learning organization is a concept that is growing in popularity and use, but we are only beginning to set a theoretically grounded foundation in place that is verified through rigorous research. Additional studies in a variety of cultural and international contexts will add to the stability of this foundation, or point out weak spots
that can be addressed through refinement and development of the research, theory, and practice of the learning organization.

References


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