THE INFLUENCE OF INDIVIDUAL AND ORGANIZATIONAL VARIABLES ON INFORMAL LEARNING AMONG NURSES IN KOREAN HOSPITALS

BY

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DISSERTATION

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ABSTRACT

Health professionals work in knowledge organizations where human capital is the most important asset. The development of quality and efficiency in treatment and care depends mainly on the ability of staff to use, refine and learn new knowledge and skills. Learning in hospital settings is both formal and informal. Marsick (2006) suggests that approximately 80 percent of skills in hospital work are learned in informal, day-to-day interaction. Formal learning has been extensively studied, and there are many reports on the design and outcomes of formal continuing professional development for nurses and physicians; however, there are few studies exploring informal learning by nurses. Therefore, the present study identifies the hierarchical linear relationship among informal learning, individual and organizational variables of nurses in hospitals, to empirically demonstrate the personal and organizational factors influencing informal learning while considering the different organizational scales and cultures between hospitals and to determine the extent to which individual nurses engage in informal learning.

Regarding individual and organizational level variables, a questionnaire assessed Informal Workplace Learning Outcomes, individual level variables (Task Variety, Task Significance, Friendship with Other Nurses and Learning Motivation), and organizational level variables (Empowerment, Leadership, Perception of Team's Support, and Openness of Team's Communication). To collect the data for this study, approximately 2,300 nurses working at 5 medium-to-large-sized Korean hospitals with more than 250 beds were invited to complete the questionnaire survey online. Overall, 218 complete responses were analyzed using One-Way ANOVA and hierarchical linear model (HLM) analysis.

Results indicated that individual level variance accounted for 84.6% of total variance and organizational level variance accounted for 15.4% of total variance in informal learning. The effect of individual level variables (task variety, task significance, workplace friendship, and learning motivation), and organizational level variables (empowerment, perception of team's support, and openness of team's communication) about informal learning were significant. Interaction effects of task variety and empowerment, task variety and perception of team's support, task significance and perception of team's support, workplace friendship and openness of team's communication, and learning motivation and perception of team's support on informal learning were found. However, there were no significant differences in nurses' informal learning outcomes among hospitals. Detailed results and implications of these findings, limitations, and future research suggestions are discussed.

Keywords: informal learning, individual and organizational variables, hierarchical linear model (HLM), nurses in large hospitals, South Korea

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CHAPTER 1: INTRODUCTION

The recent emphasis on workplace learning parallels the trend characterized by the advent of knowledge-based economy where a learning society shifts towards a learning economy society, blurring the line between workplace and learning (OECD, 2001). That is, the existing training-focused adult learning is being transformed into the workplace-focused learning (Bierema, 2001). Since 2014, the renowned talent development organization ASTD (American Society for Training and Development) has officially replaced the term T&D (Training and Development) with WLP (Workplace Learning and Performance). Likewise, corporate in-house training focuses on workplace learning. Still, workplace learning is not a new concept and from the changing perspective, there is a need to develop in-house programs, including training and HRD (Human Resource Development). Most recently, the term WLP has been employed to emphasize not only learning, but also performance. In short, the perspective towards corporate in-house programs has moved from training to learning and recently to performance through learning (Moon, 2006).

Knowledge and information in the 21st-century knowledge society are perceived as key elements for creating corporate wealth and value (OECD, 2001, 2002). With knowledge and information being increasingly considered important in the global age, individuals need to be able to select and concentrate particularly by refining information (McCarthy, Garavan, & O'Toole, 2003; Roth, 2004). In this context, research on 'workplace learning' has emerged since the 1990s with an aim to analyze the integration of work with learning. Workplace learning refers to a process of acquiring knowledge, skills, and attitudes necessary to improve work performance or cope with work-related issues through constant interactions occurring formally, informally, or accidentally around workplaces (Bratton, Jean, Timothy, & Peter, 2003). Even

though the importance and effectiveness of workplace learning is emphasized, it has been reported that formal learning in workplaces differs from job-related practical learning; thus, learners often fail to apply what they learn in practice (Raelin, 2000; Rothwell, 2002), and they find it difficult to keep up with the rapidly evolving technology and increased customer expectations (Hartley, 2000; Sternber & Keeton, 1999).

In the same vein, organizational HRD (human resource development) efforts have been diversified in pursuit of value creation based on knowledge and information acquired from experts or high performers, unlike in the past, when such efforts were focused on having organizational members learn knowledge or skills. Such efforts have driven attention towards informal learning in tandem with the contextual and relational workplace learning, instead of some training programs led by training centers (Longworth & Davies, 1996). With workplace learning being applied more extensively and frequently, it has evolved into discrete forms that allow organizational members to learn things as necessary and acquire knowledge from diverse experiences, e.g., self-directed learning, experience learning, action learning, transformative learning, and on-the-job learning (Kolb, 1984; Knowles, 1990; Mezirow, 1991; Watkins & Marsick, 1992; Rothwell, 2002). In lieu of the conventional formal learning, the abovementioned forms of informal learning are included in the category of workplace learning, which involves dialogs, experiences, observations, and reflections (Enos, Kehrhahn, & Bell, 2003). Thus, informal learning is defined as experiential or practical learning directed by learners for performance in diverse settings without constraints of time and place (Cseh, Watkins, & Marsick, 1999; Malcom, Hodkinson, & Colley, 2003; Watkins & Marsick, 1992). The existing literature on informal learning (Engestrom, 2001; Erout, 2004; Marsick & Volpe, 1999) suggests

that learning from others at work goes beyond the limited learning gained through formal programs.

To reiterate, workplace learning covers not only the perspective of HRD, which involves different learning activities arising from the organizational prescriptive perspective, but also learner-oriented experiential and routine learning activities (Hodkinson et al., 2003; Marsick & Volpe, 1999). HRD methods are sub-classified into formal learning, on-the-job informal learning, and self-development (Harbison & Myers, 1964). Informal learning accounts for 83% of workplace learning (Garrick, 1998). Furthermore, 70% of knowledge associated with business in practice is acquired via some routes other than formal learning (Cofer, 2000; Dobbs, 2000), whereas no more than 20% of formal learning is relevant to business in practice (Marsick & Watkins, 1990). Regarding the learning transfer, Holton and Baldwin (2003) remarked that no more than 10% of formal training led to job performance. A two-year study on informal learning conducted by the Educational Development Center (1998) across various companies revealed that workers acquired over 70% of learning while working with co-workers. These findings imply that informality of learning, learner-directedness, and interactions with others should be fully applied to HRD in workplaces.

It has been continuously argued that in the age of lifelong learning, organizational members engage in an array of informal learning activities offered in organizations to develop tacit knowledge (Ellinger, 2005; Longworth, 2003; Longworth & Davies, 1997; Nonaka, Toyama, & Konno, 2000; Senge, 2004). Routine meetings in workplaces, activities including communication with superiors or team members, and learning of integrated tacit knowledge account for most of informal learning and are implemented through diverse relationships (Cheetham & Chivers, 2005; Dobbs, 2000; Skule, 2004). The quality of relationship with other

members in workplaces and the extent to which one feels supported by co-workers exert significant effects on informal learning (Erout, 2004). Hence, the claim that teaching-learning models for future learning should facilitate the dissemination of information and knowledge among learners to provide diverse experiences (Bjørk et al., 2007; Ellis & Nolan, 2005; Lee, 2011; Thomson et al., 2001, 2009) is applicable to workplaces as well.

The context of interpersonal relationship surrounding business is inherent in informal learning in workplaces (Boud & Middkeon, 2003). Hence, the forms or levels of informal learning vary with the nature, scale, or competitiveness of organizations. Thus, the workplace context that involves organizations, teams, individuals, organizational culture, and ethos largely influences the informal learning (Billett, 2001; Engerstrom, 2001; Eraut, 2004; Marsick & Watkins, 1990). This study assumes that workplace learning is influenced by the unique nature of an organization to which one belongs (Illeris, 2004). In particular, hospitals differ from ordinary organizations on the grounds that the key activities associated with patient care and treatment require a multi-disciplinary organic collaboration between professionals and assistants and that service production is subject to complex conversion processes. Additionally, hospitals rely on the labor force equipped with high levels of expertise, which is why the quality control of produced services is challenging (Roth, 2004; Sleezer, Conti, & Nolan, 2004). As an organization characterized by a combination of diverse professionals, efficient achievement of organizational goals necessitates the reinforcement of knowledge competitiveness of the entire staff across the board (Henderson et al., 2011). In this context, hospital organizations emphasize organizational learning activities to enhance the knowledge competitiveness (Illeris, 2003). After all, as the members of hospital organizations, nurses are required to become life-long and life-wide learners.

Background of the Study

A hospital is a workplace where nurses apply their accumulated knowledge to implement nursing services in the treatment of patients. Nurses play a central role in the operation of hospitals, as they make various contributions. They implement nurse care activities and conduct duties in hospital administration, which requires medical knowledge (Morton-Cooper & Palmer, 1993). Therefore, nurses' capabilities in a hospital are directly linked to the hospital's competitiveness (Kim, 2007; Lee & Kim, 2000; Murphy, 2008). Because of these important roles, hospitals have become the place where various educational programs are provided to nurses and learning activities are promoted.

In Korea, health care personnel receive continuing medical education as part of lifelong education. Referring to a systematic completion of the latest theories and information as per predetermined procedures, continuing medical education involves certain programs designed to reinforce, refine, and remedy the knowledge or skills necessary for professional performance (Korean Nursing Association, 1984). Currently, continuing education for health care personnel is carried out within the statutory duties. Pursuant to the Health Care Act (Article 30) and the enforcement regulation (Article 20), continuing education for nurses is compulsory with a goal of helping nurses to acquire requisite practical, instructional and administrative skills and attitudes for their professional growth and development at accredited institutions in charge of continuing nursing education for at least 8 hours yearly (Korean Nursing Association, 2009). The Korean Nursing Association (KNA) launched the online training center in February 2004 to reinforce the established continuing education with the intent to meet a range of demands for education and needs for specialized learning.

Recently, Korean medical institutions have implemented various business strategies in an effort to offer diverse, differentiated medical services to meet the needs of patients (Lee et al., 2014). Also, the patients are demanding a high level of nursing services. To satisfy this demand, "therapeutic helping skills" are needed (Noh et al., 2010). The purpose of nursing organizations is to offer high-quality nursing services, which requires efficient nursing personnel management. Nurses represent 30-40% of hospital employees; additionally, most direct services at hospitals are provided by nurses. Therefore, nursing personnel management is crucial for hospital operation (Kim, 2007; Lee et al., 2014). To boost the quality of medical services and stay competitive, medical institutions have paid more attention to gaining and maintaining a quality nursing workforce. Thus, they have trained their nurses to become more competent through systematic education that applies even to new hires (Abuzzese, 1992).

Problem Statement

Many previous studies on workplace learning (Day, 1998; Dobbs, 2000; EDC, 1998; Hodkinson et al., 2003; Kremer, 2005; Livingstone, 2000, 2001; Reardon, 2004; Slater, 2004; Zemke, 1985) emphasized that most workplace learning occurs informally, and asserted that research on informal learning in diverse fields would be indispensable for boosting workplace learning. Nevertheless, informal learning in hospitals or healthcare organizations has not been extensively investigated.

Regarding recent research on informal learning, Watkins and Marsick (1990, 1992) as well as other authors (Bassi & Van Buren, 1999; Boud & Middleton, 2003; Crossan & White, 1999; Dobbs, 2000; Ellinger, 2005; Eraut, 2004; Garrick, 1998; Grolnic, 2001; Masick & Volpe, 1999; Moran, 2003; Svensson, Ellstrom, & Aberg, 2004; Yang & Lu, 2001) explored some

specific cases of informal learning. However, research on informal learning has a long way to go. Given that various workplace contextual factors (e.g., industry, corporate scale, team, individuals, corporate culture, ethos, and goals) influence the informal learning and that different types of business organizations need to be investigated, most papers focused on informal learning in large enterprises and manufacturers (Ahn, 2006; Enos, 2001; Moran, 2003; Wagner, 2000; Walker, 2001; Weintraub, 1998). In addition, prior studies did not quantify any cumulative knowledge or unintended results gained by individual learners from informal learning but jumped to the resultant organizational performance, reducing the causality between informal learning and its outcomes (Clarke, 2005; Kyndt et al., 2009).

Given the importance of contextual factors in influencing the informal learning (Billett, 2001; Engerstrom, 2001; Eraut, 2004; Marsick & Watkins, 1990), it is difficult to find previous studies on the informal learning in hospitals and healthcare settings. Some empirical studies reported on learning organizations where informal learning took place actively (Berg & Chyung, 2008; Hunter et al., 2008; Ryan et al., 2010; Teunissen et al., 2007;), focusing on factors necessary to build learning organizations, organizational effectiveness, job satisfaction, and other effects on organizations, which are not sufficient for characterizing the informal learning. Others investigated the preceptorship as a type of informal learning (Armitage & Burnard, 1991; Fowler, 1996; Lewis, 1986; Morton-Cooper & Palmer, 1993; Myrick & Barrett, 1994), quantifying the effects of the system or workload of preceptors, far from inferring any informality and significance of the preceptorship as a way of informal learning. Still others explored what doctors would learn through self-reflection in the course of depression treatment (Leyden, 2004) and how nurses in different positions acquired their professional skills through informal learning strategies in workplaces (Murray, 1993; Rossi, 1995; Troyan, 1996). However,

these studies focused on certain informal learning activities to establish the content of learning without characterizing the process of informal learning of interest.

In establishing the organizational and personal factors as well as informal learning, the conventional monolithic analysis, including multiple regression analysis or analysis of variance of personal factors with individuals and organizational factors with teams used as the units of analysis, would result in missing or mixed organization-level effects (Bliese, 2000). To correctly analyze the attributes of the hierarchical data structures of measurement factors, the hierarchical linear model analysis is used here to empirically demonstrate the personal and organizational factors influencing the informal learning while considering the different organizational scales and cultures between hospitals and to determine the extent to which individual nurses engage in informal learning. Accordingly, the hierarchical linear model analysis based on the estimated mean of each hospital organization should be used to examine the objective effects on individuals and organizations.

Purpose of the Study

In this context, the present study noted the need to facilitate lifelong learning of adult learners who spend most of time in workplaces, focusing on the informal learning and accounting for the most significant part of workplace learning, to shed light on some objectives related to the enhancement of informal learning and the aspect of each objective. In particular, the workplace learning process of nurses in hospitals should be investigated on the following grounds.

First, most studies on informal learning process or relevant content draw on literature review or qualitative data analysis, limiting the applicability and generalizability of the findings (Ahn, 2005, 2006; Boud & Middleton, 2003; Ellinger, 2005; Eraut, 2004; Grolnic, 2001; Lee, 2008, 2009; Lee, 2010; Moran, 2003; Svensson, Ellstrom, & Aberg, 2004). Although qualitative research is necessary due to various forms of informal learning exist and the influential context of learning, it is also necessary to expand the scope of research on informal learning to cover a range of organizational and personal contexts and to provide some quantitative reference data for further comparative analysis.

Second, the dynamic informal learning process in hospitals as a workplace, which has not been investigated in previous studies, needs be explored to understand diverse aspects of workplace learning. In hospitals, due to rapid changes of healthcare-related knowledge and technology, learning has become a routine. Because of the unique requirement of high-level 'professional skills' (Cervero, 2001; Queeney, 1996; Roth, 2004), learning could not be emphasized too much in hospitals. However, the 24/7 day-and-night service provision system hinders healthcare staff, including nurses, from attending formal learning programs outside of normal work hours and traditional setting. Therefore, workplace learning in hospitals is done in work settings informally rather than formally. Hence, to understand the diversity of workplace learning, the process and relevant aspects of informal learning in hospitals are worth exploring, given that hospitals as workplaces have hardly been addressed in previous studies.

Theoretical Framework

The theoretical framework constituting the foundation for this study was a re-conceptualized version of the Marsick and Watkins (1990, 1997) and Watkins and Marsick

(1992) models of informal and incidental learning. The Marsick and Watkins model (1990, 1997, 2001) was based on the action science perspectives of Argyris and Schön whose work was in turn largely informed by Dewey's theories of learning from experience and Lewin's approaches to understanding the interaction of individuals with their environment (Marsick & Watkins, 1997).

Marsick and Watkins (1997) developed a model for informal and incidental learning inherent in one's routine work and mediated by contexts (Cseh et al., 1999). These authors argued that learning occurred via certain internal/external sources and experiences, juxtaposed with deliberate aspects of the conventional formal learning. As they frame it within their context according to their beliefs and assumptions, which are often unconscious, they consider strategies to solve the problem. Throughout this process, there is a presence of action and reflection. Additionally, there are often intended and unintended consequences because of the learning process.
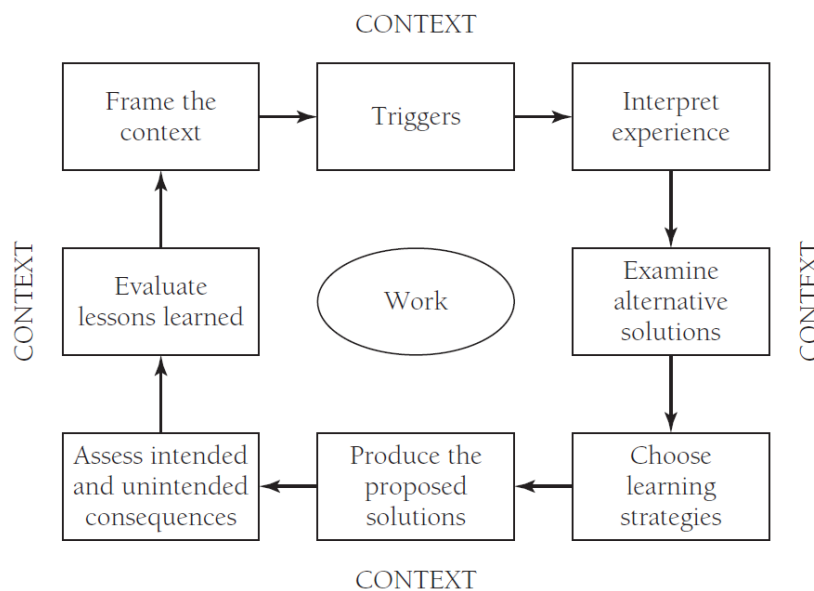
Figure 1-1. A Re-conceptualized informal and incidental learning model
Source: Cseh, Watkins, and Marsick, 1999, p. 70.

Marsick and Watkins' informal and incidental learning model was used in many studies to investigate individual- and organization-level variables that affect informal learning. In particular, organizational learning is conditioned by personal learning (Argyris & Schön, 1981; Nonaka, 1994), which is why individual-level variables are significantly associated with informal learning. Implemented in routine and non-routine jobs, workplace learning varies with job characteristics (Billett, 2001). Marsick and Volpe (1999) reported that informal learning was closely related to routine jobs. The variation and significance of tasks proved to be overriding common variables of informal learning based on the results of the studies on job characteristics. Task variation refers to the extent to which new challenging tasks are allotted to workers. Task variation reinforces informal learning (Doornbos et al., 2008; Ellström, 2001; Hackman & Lawler, 1971; Hackman & Oldham, 1975, 1980; Turner & Lawrence, 1965). Task significance refers to the importance one assigns to given tasks. Research on task significance reported that informal learning occurred when one perceived he/she exerted positive effects on others (Hackman & Oldham, 1975, 1980; Joen & Kim, 2012; Turner & Lawrence, 1965).

Job characteristics are exogenous variables affecting individuals within an organization, whereas socio-psychological characteristics refer to endogenous variables inherent in individuals (Berg & Chyung, 2008; Christina, 2001; Helm et al., 2007; Li, 2001; Steward, 1996). As informal learning is far from structured or formal programs, it requires learners to be motivated to learn (Berg & Chyung, 2008; Helm et al., 2007; Li, 2001). In addition, since informal learning occurs through natural contacts with colleagues at work, interpersonal and human relationships play pivotal roles in informal learning (Christina, 2001; Stewart & McGoldrick, 1996).

Illeris (2004) reported that workplace learning resulted from the interactions between environmental variables influencing learners' learning process and learning itself. As learning is influenced by the unique characteristics of one's organization, organizational characteristics serve as variables that facilitate or hamper the learning process (Marsick & Volpe, 1999). Therefore, it is necessary to investigate both personal and organizational characteristics affecting the informal learning. Literature on informal learning (Chiva-Gomez, 2004; Clarke, 2005; Enos et al., 2003; Knowles, 1950; Sambrook & Stewart, 2000; Skule, 2004) emphasized the roles of leadership. The interaction between personal factors, e.g., individual learner's motivation to learn, and the support from the learning-committed leadership promote learning and skill acquisition (Ashton, 2004). Additionally, superior empowerment behavior and organizational communication proved to exert significant effects on informal learning (Abbey, 1999; Clarke, 2005). As informal learning incidentally arises out of casual conversations and information exchange among colleagues, organizations should encourage a communication climate favoring honest expressions of thoughts and opinions, regardless of ranks or personal relations (Abbey, 1999). Moreover, the support from superiors and organizations is another factor influencing the extent of informal learning (Ashton, 2004; Eisenberger et al., 1986; Enos et al., 2003; Sambrook & Stewart, 2000). An organizational member's perception of organizational support reinforces his/her belief that the organization will fulfill its duty in the form of compensation or recognition in exchange for his/her deeds (Wayne et al., 1997).

Since learning takes place through interactions between organizational and personal attributes (Marsick & Watkins, 2001, 2003; Park & Lee, 2012), theories of learning organization focusing on identifying the relation between organizational factors and informal learning have been criticized in research on informal learning for overlooking the individuals' knowledge

construction process (Garavan, 1997; Lee & Roth, 2007; Small & Irvine, 2006; Thomas & Allen, 2006; Tsang, 1997).

A model representing the theoretical relationship to be examined in this study is presented in Figure 1-2.
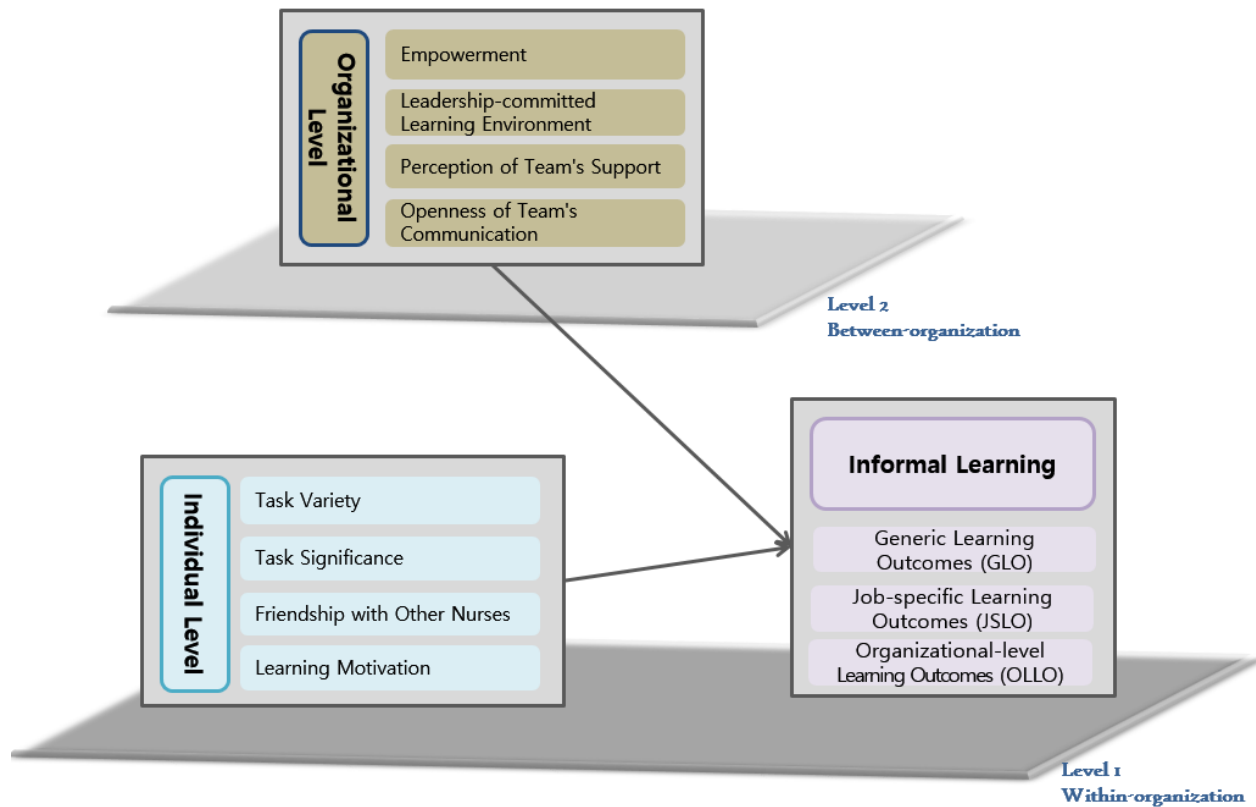
Figure 1-2. A conceptual model of the study

Research Questions

To empirically analyze the relationship of personal and organizational attributes with nurses' informal learning, the following questions are raised.

1. What is the status of nurses' informal learning and what are individual and organizational factors influencing their informal learning?

   1.1. What is the status of informal learning among nurses?

   1.2. What individual nurse factors (task variety, task significance, friendship with other nurses, and learning motivation) influence their informal learning?

   1.3. What organizational factors (empowerment, leadership-committed learning environment, perception of team's support and openness of team's communication) influence their informal learning?

2. Does informal learning vary by individuals and across organizations?

3. How do individual factors affect informal learning?

4. How do organizational factors affect informal learning?

5. What are the effects of interactions between individual and organizational factors on informal learning?

Significance of the Study

The present study has both theoretical and practical significance. The understanding the informal learning of nurses in hospitals is based on the understanding of workplace learning. This study empirically verifies diverse personal and contextual factors influencing the informal learning as a form of workplace learning, and the findings could serve as the reference data to design various instructional theories and strategies in HRD. In addition, the present empirical findings may be used as the reference data for policy decisions about building learning systems and organizations for professionals, including nurses and doctors in hospitals, which have rarely been mentioned in HRD studies.

First, this study contributes to theorization and modelling by proving the relationship between personal and organizational factors concerning informal learning in HRD. To implement and investigate learning, it is important to provide a relatively stable and constant instructional support or care (Hyun, 2004). Learning occurs through dynamic interactions between formal and informal learning, where the former stimulates the latter, which in turn guides learners to engage in more structured learning activities (Shipton, Dawson, West, & Patterson, 2002). However, previous studies have focused on corporate training settings represented by collective formal learning, and even well organized learning does have limitations. Therefore, formal and informal learning could be ideally complementary to each other, in which sense research on informal learning will be conducive to facilitating the culture of workplace learning.

Second, the present findings could help HRD researchers understand the workplace learning among healthcare professionals. Workplace learning activities of nurses, as important human resources in hospitals, have constantly been investigated, although they have been largely limited to nursing skills and related knowledge (Bahn, 2007; Cervero, 1988; Ludwick & Silva, 2000; Park, Kim, & Lee, 2003; Yam, 2004) instead of elucidating the informal learning among nurses (Bjørk et al., 2013). Most research on HRD has dealt with informal learning in large enterprises and manufacturers instead of diverse workplace settings (Enos, 2001; Mau, 2002; Moran, 2003; Sloan, 2002; Trochiano, 2002; Wagner, 2000). Given that organizational contextual factors significantly influence the informal learning (Billett, 2001; Engerstrom, 2001; Eraut, 2004; Marsick & Watkins, 1990), establishing the effects of unique organizational attributes in hospital settings on informal learning could contribute to broadening the horizon of research on HRD.

Third, the present findings could be used in practice by policymakers and professional educators who are to build learning systems for continuing education in workplaces among healthcare professionals. Previous findings have focused on verifying the efficiency of instructional methods and effective learning outcomes in certain jobs (Bjørk et al., 2007; Ellis & Nolan, 2005; Lee, 2011; Thomsen O'Brien et al., 2001, 2009). The present study provides some empirical evidence to support the atmosphere and policy measures that would facilitate learning among organizational members in hospitals, which offer an ideal setting for workplace learning.

As mentioned above, the present findings on personal and organizational factors facilitating the informal learning among nurses who are workers in hospital organizations are likely to give HRD researchers some insight into informal learning among workers. Active informal learning in workplaces, including hospitals as a learning organization, will meet personal needs for achievements and thus contribute to creating a new paradigm for learning in workplaces committed to learning.

Definition of Terms

While operational definitions of the constructs and associated sub-dimensions of this study are stated in Chapters 2 and 3, the following definitions of terms help readers understand specific terms used in the literature review and methods sections.

Informal learning. Informal learning includes all forms of experiences occurring in workplace other than formal educational settings and refers to the performance of learning conducted via interactions with team members, application of information used in business, business activities, and personal reflections. In the present study, informal learning performance

refers to generic learning outcomes, job-specific learning outcomes, and organization-level learning outcomes prescribed in the 'Questionnaire on Informal Workplace Learning Outcomes' developed by Kyndt et al. (2014). It is represented by the ratings of nurses based on the instrument modified and adapted by the researcher in accordance with the hospital settings where the respondents work.

Task variety. Task variety refers to the extent to which one encounters exceptional events rather than repetitive tasks in the process of carrying out tasks, and it is assessed by items about task variety from the JDS (Job Diagnostic Survey), as rated by nurses, developed by Hackman and Oldham (1975).

Task significance. Task significance refers to the extent to which a task is perceived as significant as a result of some positive effects of a worker's job on herself/himself as well as others in adjacent internal and/or external organizations, measured by items assessing task significance of the JDS (Job Diagnostic Survey), as rated by nurses, developed by Hackman and Oldham (1975).

Friendship with other nurses. Friendship with other nurses in workplaces refers to one's attitude towards or perception of organizational members (e.g., superiors, colleagues, and subordinates) working directly and indirectly together (Madsen, Miller, & John, 2005). It considers the friendship opportunity and friendship prevalence in workplaces. Friendship with other nurses is assessed by items of the Workplace Friendship Scale (WFS), as rated by nurses, originally developed by Nielsen, Jex, and Adams (2000) and modified and adapted by the researcher in accordance with the hospital settings where the nurses work.

Learning motivation. Learning motivation refers to an inner state or process that triggers one's learning behavior and determines the direction, level, and intensity of the behavior (Gibson, 1980). Learning motivation in this study is measured by the items concerning performance-oriented learning motivation, as opposed to learning-oriented learning motivation from the instrument originally developed by Button, Mathieu, and Zajac (1996), and adapted by the author in accordance with the hospital settings where the respondents work.

Empowerment. Empowerment refers to a process of enhancing team members' self-efficacy and control whilst eliminating the helplessness of bureaucracy (Conger & Kanungo, 1988). This study focuses on the relational empowerment and perception of superiors' empowerment acts. Empowerment in this study is measured using the instrument, Leader Empowering Behavior Questionnaire (LEBQ), originally developed by Konczak, Stelly, and Trusty (2000), and adapted by the researcher in accordance with the hospital settings the respondents work. The tools and question items for measuring other factors are removed from the original instrument.

Leadership-committed learning environment. Leadership-committed learning environment refers to the leadership that continuously reinforces various resources and opportunities for learning required to fulfil a job. This study takes teams as the unit of analysis. Therefore, leadership here refers to characteristics of a team leader measured by items assessing 7 attributes of learning-oriented leaders using the instrument developed by Ellinger (2005) and adapted by the researcher.

Perception of team's support. Perception of team's support means the perception of a team member towards the team's recognition and reward support. Perception of team's support

in this study is measured by items originally developed by Eigenberger et al. (1986) and adapted by the researcher. In short, the perception of team's support refers to a member's perception of his/her team's support.

      <u>Openness of team's communication</u>. This term means the effectiveness of communication activities occurring in a team, including the openness of verbal and nonverbal communication and all communication efforts for empathy among team members in an organization. In this study, the openness of team's communication is measured by items derived from the instrument originally developed by Hyatt and Ruddy (1997) to measure the effective communication and adapted by the researcher in accordance with the hospital settings where the nurses work.

CHAPTER 2: LITERATURE REVIEW

The purpose of this chapter is to review the literature on workplace learning and informal learning in clinical practice. This chapter begins with an overview of workplace learning and continuing professional education for nurses. The next section is a review of the concept of informal learning including the history, definitions by different researchers, and its characteristics. The third section reviews the individual-level factors relevant to informal learning, e.g. job characteristics, motivation for learning, interpersonal relationship, self-efficacy, and the capability to use tools for learning, which are sub-divided into general and socio-psychological attributes. The last section reviews organizational factors of informal learning, e.g., empowerment, perceived organizational support, learning-committed leadership, open communication, and accessibility to colleagues. These organizational characteristics in the course of learning may serve as the factors that facilitate learning, as learning is influenced by the unique characteristics of organizations to which individuals belong.

Workplace Learning in Nursing

Workplace Learning: Definition and Characteristics

The emphasis on workplace learning parallels the current trend of blurring boundaries between the workplace and learning attributable to the advent of knowledge-based economy and the shift from learning society to learning economy (OECD, 2001). That is, adult learners' workplace learning has turned from the conventional training-centered learning to learning-oriented workplace learning (Bierema, 2001:41). As a leading HRD agency in the US, the ASTD (American Society for Training and Development) officially replaced the term training and

development (T&D) with workplace learning and performance (WLP) in 2004. Here, WLP (Workplace Learning and Performance) refers to an integrated application of learning and other interventions intended to improve personal and organizational outcomes (Rothwell, Sanders, & Soper, 1999).

Likewise, corporate in-house training programs focus on workplace learning. Yet, workplace learning is not a newly emerging concept; instead, it should be viewed as a shift in the perspective toward corporate in-house programs, including training and HRD (Human Resource Development). More recently, the term WLP has been increasingly used to stress not only learning, but also performance. In other words, the perspective toward corporate in-house programs has shifted from training to learning-induced performance (Moon, 2006).

Although workplace learning generally refers to 'learning at work,' it also involves a wide range of learning activities performed in the workplace (Rothwell, Sanders, & Soper, 1999). Yet, there is no consistent theory on workplace learning, and the definition of the concept varies with authors and the foci of their research. Some emphasize the routineness, interactivity, and informality of workplace learning while others conceptualize it from an integrated perspective that encompasses multiple characteristics. Table 2-1 presents the definitions of workplace learning.

Table 2-1.

Definitions of workplace learning

Focus	Author	Definition
Interactivity	Billet (1994)	Workplace learning refers to acquiring knowledge and skills in the course of performing one's job with the aid of skilled colleagues or experts.
	Cunningham (1998)	The overriding factor in workplace learning is continuous interactions with others. Notably, learning via interactions between experts and non-experts is the essence of workplace learning.
	Spencer (2001)	Workplace learning is the learning that task performers routinely engage in.
	Sutherland (2002)	Workplace learning occurs in the course of job performance, which does not imply training programs focused on tasks or limited organizational needs, but involves the needs of many stakeholders, e.g., learners and employers.
Informality	Marsick (1987)	Workplace learning means how individuals or groups acquire, interpret, organize, change or assimilate related information, skills or emotions, including building out some meanings in personal or collective life. Adults make use of informal learning to better understand not only explicit knowledge or skills, but also themselves, colleagues, and organizations.
	Hales (1995)	Workplace learning may be formulated as a part of systematically developed programs. Still, the concept of learning in the course of job performance is more important. Mostly, workplace learning consists of informal learning through observation of how others work, coaching and mentoring.

Table 2-1.

Definitions of workplace learning (continued)

Focus	Author	Definition
Integration	Boud & Garrick (1999)	Corporate advancement and personal development converge on the workplace. Workplace learning is conducive to developing not only immediate competencies required in the workplace but also future ones. Workplace learning involves acquiring specific capabilities and skills as well as general capabilities, and takes place regardless of time and space wherever knowledge and competencies are needed.
	Shipton et al. (2002)	Workplace learning arises out of dynamic interactions between formal and informal learning.

Workplace learning involves an array of learning activities from the perspective of HRD, or organizational prescription, as well as learner-centered experiential and routine learning activities (Ahn, 2006). Workplace learning considers not only different perspectives, as outlined above, but also common qualities, as indicated below. First, workplace learning not only emphasizes the spatial meaning of the workplace, but also encompasses all work-related contents, methods, and processes of learning. That is, workplace learning enables workers to learn various contents in various ways in the process of performing various tasks. Second, workplace learning highlights learning through interactions between individuals and their organization. Individuals or organizations do not perform learning unilaterally; instead, learning takes place when the two influence each other actively. Even though learning is driven by individuals, it arises from activities or relations within teams, groups, or organizations. Third, workplace learning is affected by organizational contexts. Unique organizational structures and cultures are important variables influencing the workplace learning. Such organizational

characteristics serve as the variables that both boost and hinder learning. Fourth, workplace learning emphasizes the perspective of learners rather than providers. Unlike the conventional HRD that focuses on the tasks for which learners are accountable in the organization, workplace learning focuses more on learning. Fifth, workplace learning underscores the informality of learning. Indeed, many authors concluded that workplace learning occurred informally (Day, 1998; Dobbs, 2000; EDC, 1998; Zemke, 1985). The 1996 Bureau of Labor Statistics Survey reported that 70% of job-related knowledge was acquired informally (Loewenstein & Spletzer, 1999). After all, as the existing HRD system has limitations, the importance of informal learning must be emphasized in the context of workplace learning.

In short, workplace learning involves a spatial aspect of workplace and a procedural aspect of work, and it is characterized by the learner-centered learning, which highlights the informality conditioned by interactions between individuals and organizations and by organizational contexts.

Characteristics of Workplace Learning in Nursing

Workplace learning is influenced by unique organizational characteristics (Illeris, 2004). To investigate how learning takes place in the workplace of nurses, the unique characteristics of hospitals where nurses work should be examined. Unlike other organizations, hospitals are characterized by their services implemented through complex transferal processes, as their core competence in caring for patients is underpinned by the organic cooperation of multiple specialists and assistants. Additionally, hospitals rely on highly specialized labor force, which makes it difficult to control the quality of services produced (Bjørk, Tøien, & Sørensen, 2013).

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In hospitals, organizational goals are achieved by the multidisciplinary cooperation of nurses, medical technicians, and management staff, as well as doctors who play pivotal roles in hospitals rather than only by the hard work of staff in a single team or department. As hospitals depend on combined services of health and allied professionals, the efficient achievement of organizational goals requires all organizational members to enhance their knowledge competitiveness (Ellis & Nolan, 2005), and organizational learning is emphasized as a way to strengthen the knowledge competitiveness (Tucker et al., 2007). Thus, as a part of hospital organizations, nurses are required to transform into lifelong learners who continuously engage in learning for their daily life.

Hospital-based education programs for nurses are largely divided into continuing nursing education and clinical training education. Continuing nursing education is intended to help nurses keep up with essential knowledge and skills needed for professional performance, serving as a form of lifelong education to update nurses on the latest theories and information using systematically predetermined curriculums.

Clinical training education concerns communication and consultation, management of environment, and evaluation. In the conventional adult nursing program, it emphasized the acquisition of the basic nursing skills and communication skills in the wards chosen based on subjects' needs. Clinical training education includes explanation, observation, and performance through which the instructors provide learners with learning experiences (Jeong, 2005). Particularly, most hospitals adopt the preceptorship program for clinical training education. The rationales behind the preceptorship program include Tough's learning method theory that 1:1 education provides the most effective learning opportunity, Bandura's social learning theory that

humans socialize by imitating their role models' thoughts and actions, and the humanitarian education method that appreciates personal traits (Bellinger & McCloskey, 1992).

The preceptorship program is widely used to narrow the gap between the theories and practice in clinical settings and in the socialization of new nurses effectively in hospital settings (Bain, 1996). In the preceptorship program, preceptors play crucial roles both as the instructors teaching the clinical practices to new nurses in nursing units and as experienced colleagues, facilitating nurses' adaptation, helping nursing students acquire new roles and socialize, becoming role models for the growth and development of nursing students within a short time limit, and playing the roles of teachers, counselors, and supporters (Choi & Nam, 2012; Clayton et al., 1989).

The preceptorship is more than just the orientation for new nurses, it improves new nurses' job skills in a short period and helps them adapt to their organizations to improve nursing quality and for the prevention of nursing errors. Additionally, the preceptorship provides not just for new nurses, but also for preceptors with professional development and job satisfaction, and as such, it benefits nursing organizations, since it provides an opportunity for the development of experienced nurses (Bain, 1996; Kaviani, & Stillwell, 2000).

Research on informal learning (Murray, 1993; Rossi, 1995; Troyan, 1996) presented the preceptorship as an effective method of informal learning and highlighted that trials, errors, and relationships with doctors and colleagues proved to be other routes to informal learning. This finding suggests that nurses' workplace learning is a part of a range of informal learning activities closely associated with clinical training education.

Present Condition of Continuing Medical Education for Nurses in Korea

In Korea, health care personnel receive continuing medical education as part of lifelong education. Referring to a systematic completion of the latest theories and information as per predetermined procedures, continuing medical education involves certain programs designed to reinforce, refine, and remedy the knowledge or skills necessary for professional performance (Lee, 1984). Currently, continuing education for health care personnel is carried out within the statutory duties. That is, the Medical Care Act (Articles 28-2 and 28-3) and its enforcement regulation (Article 21-2) stipulate that all health care personnel must receive continuing medical education. Since the statutory foundation was laid for enforcing the continuing medical education as of December 31, 1981, qualified health care personnel engaged in health care services have been required to complete the continuing in-service training programs yearly for at least 8 hours. The continuing medical education programs are organized and arranged by professional societies operating under central associations or local branches of each profession.

The education committee of the Korean Nurses Association leads continuing nursing education. The association collects opinions of each branch and members to develop the continuing nursing education and core subjects. Currently, authorized continuing nursing education programs were developed in 1997 by the Korean Nurses Association (KNA), KNA-accredited continuing nursing education programs, the seminars officially accredited as continuing nursing education among the KNA's academic programs, and Advanced Practice Nurse (APN) courses (Anesthesia APN, Home Health Care APN, Psychiatric Mental Health APN) stipulated in the Medical Service Act and the Mental Health Act (Choi, 2009).

First, the KNA organizes the continuing education programs. Specifically, the KNA's board of education collects comments from local branches and members every year to develop the continuing education programs (Kim, 2001). Accredited continuing education programs last

for five years. Thus, the currently accredited continuing education programs include those developed and approved by the KNA since 2004, local and global academic conferences and nurse-practitioner courses stipulated in the Health Care Act (e.g., public health, anesthetist, mental health, family and infection control).

Institutions in charge of continuing education for nurses include the KNA's 17 municipal offices and affiliated groups, nursing education institutions offering 3-/4-year courses, academic hospitals affiliated with universities, and accredited and designated continuing education institutions (hospitals with over 150 beds where over 90% or 60 nurses have the KNA's membership and academic organizations registered in the Korea Research Foundation; over 50% of KNA's members are academic organizations) (Korean Nursing Association, 2009a). The continuing education consists of offline and online courses. Offline continuing education programs include the KNA's programs for instructors and circuit programs and other continuing education programs offered by continuing education providers (Korean Nursing Association, 2009a). Online education has significantly increased over the past few years. However, the online program is still limited to the KNA's 1-day continuing education program delivered in the form of collective lectures.

Second, the on-the-job training programs offered in hospitals are another type of continuing programs. Nurses graduate from 3-year nursing colleges or 4-year university courses and pass the national exam to be licensed by the Minister of Health, Welfare and Family to engage in health care activities. Nurses are categorized into clinical nurses, public health nurses, industrial nurses, school nurses and insurance assessment nurses based on their health care activities. On-the-job training programs vary with the sizes and attributes of hospitals. Large hospitals have in-house departments in charge of organizing the on-the-job training programs,

whereas small-and-medium hospitals cannot afford internal on-the-job training programs but instead encourage their nurses to attend such programs offered in nearby large hospitals. The tertiary hospital of interest here runs a nurse training team responsible for the on-the-job training programs.

According to the data from the parliamentary audit of the Ministry of Health, Welfare and Family in May 2008, 3,252 (2.8%) out of 115,235 nurses failed to receive the continuing medical education (CME), indicating relatively good compliance with the compulsory CME requirement.

Informal Learning in Workplace

Informal Learning: Definition and Characteristics

Definition. As one of the most common types of learning at work, informal learning is an important activity for HRD (Marsick & Volpe, 1999). Intended to support the performance-oriented HRD paradigm, informal learning activities meet the needs of organizations that emphasize learning activities. Given that the performance-oriented HRD focuses on workplace learning and its application, the need for informal learning keeps increasing (Conlon, 2004; van Woerkom, 2004).

Knowles first introduced the term informal learning in 1950 in 'Informal Adult Education.' Still, the concept originates in the experiential learning suggested by Dewey (1938) (Cseh, Marsick, & Watkins1999; Enos, Kehrhahn, & Bell, 2003). Both informal learning and experiential learning emphasize experiences as important factors in learning and value 'reflections' in the course of learning (Marsick & Watkins, 2001). Yet, they differ from each

other in that informal learning together with the systematic and deliberate formal learning conceptualizes the formality of learning (Han, 1997), whereas experiential learning is a systematically designed and developed method to support the informal learning (Yorks, 2003).

The concept of informal learning varies with authors. First, Marsick (1987) elucidated the importance of informal learning in HRD or at work and derived noteworthy implications. In 1990, Marsick and Watkins defined informal learning in terms of the control over learning, the extent of structures, and the roles of experiences. That is, informal learning, far from the structured formal learning, takes place in organizations or institutions, is controlled by learners, and consists of meaningful experiences (Marsick & Watkins, 1990; 2001).

Meanwhile, Marsick and Vople (1999) defined informal learning based on the extensive analysis of literature on informal learning published up to 1999, referring to informal learning as 'mostly unstructured, experiential and non-institutional learning' (Marsick & Volpe, 1999:4). That is, informal learning is not based on systematic formality, procedures, pre-set learning hours, places, contents, methods or curriculums; instead, it occurs experientially based on contextual practices (Malcom, Hodkinson & Colley, 2003). They clarified three aspects of informality. Still, emphasizing the static aspect of informal learning, they overlooked the procedural aspect. That is, the 'reflection' playing a significant role in informal learning was eliminated from the definition of informal learning (Brooks, 1999).

The Center for Workforce Development (CWD, 1999) viewed informal learning in light of tasks and defined it as a process of learning that is not controlled or governed by organizations, emphasizing that informal learning exists apart from organizational goals or strategies. That is, the CWD's definition highlights the coincidental contexts or unintended

aspects of informal learning that takes place in the process of diverse experiences of organizational members. On the other hand, Marsick and Vople (1999) stated that personal choices, preferences, and willingness facilitated informal learning, stressing the intentionality of individuals, which implies that informal learning may be both unintentional and intentional. Lohman (2005) defined informal learning as 'activities taking place at work as part of learning to develop one's professional knowledge and skills'. Grolnic (2001) conceptualized informal learning as a type of learning not determined by organizations. In sum, the foregoing definitions illuminate the point that informal learning encompasses all aspects of learning occurring in the workplace and takes advantage of routine experiences to develop one's value, belief, knowledge and skills (Saunders et al., 2005).

Meanwhile, Mocker and Spear (1982) defined informal learning as unintentional learning without preparation or planning while Choi (2009) defined it as an unstructured and unplanned learner-controlled learning. Additionally, Ellinger (2005) referred to informal learning as a natural learning opportunity arising from job-related activities when individuals control their learning for themselves. These definitions suggest that informal learning occurs in work-related activities in an unplanned and unintended way but that learners consciously select the situation (Evans, 2003). In other words, learners raise questions, reflect on certain phenomena, and explore various resources and support for learning, and in this sense, the learning process will naturally contain some conscious efforts for learning (Marsick & Watkins, 1990).

Table 2-2 outlines the definitions of informal learning by different authors.

Table 2-2.

Definitions of informal learning

Author	Definition
Marsick & Watkins (1990,2001)	Informal learning occurs in organizations or institutions, is not structured, unlike the formal learning, and draws on experiences, where learners control learning.
Mocker & Spear (1982)	Informal learning is unintentional learning without particular preparation and plans.
Marsick & Vople (1999)	Informal learning is unstructured, experiential, and non-institutional learning.
Center for Workforce Development (1999)	Informal learning is a learning process not controlled or governed by organizations.
Grolnic (2001)	Informal learning process is not determined by organizations.
Ellinger (2005)	Informal learning is a natural learning opportunity arising out of one's job-related activities, when individuals control their learning.
Lohman (2005)	Informal learning is part of workplace activities to develop one's professional knowledge and skills.
Choi (2009)	Informal learning is unstructured or unplanned and controlled by learners.

Based on the foregoing literature, informal learning posits that the workplace in itself is a venue for unstructured, unintended, or intended learning, that learners drive learning, and that experience is emphasized. The unstructured quality of informal learning implies being free from spatial and temporal constraints and involves all aspects of learning that one could encounter in routine life or job-related activities, where spontaneous and immediate reactions take place

(Billett, 2001; Day, 1998). That is, informal learning arises out of workplace activities and interactions among organizational members without separate temporal and spatial settings, which ensures the immediate reactions.

In addition, the quality of being intentional or unintentional suggests that the formal learning is characterized by organization-driven prepared curriculums run for a certain preset period, whereas informal learning is unintentional without prior preparation or plans. Learners may engage in intentional learning to meet their needs arising in the course of performing jobs outside of some prescribed learning settings, or they may join learning activities unintentionally but with some conscious self-awareness (Conlon, 2004; Enos, Kehrhahn & Bell, 2003; Marsick & Vople, 1999; Tough, 1982; Watkins & Marsick, 1992). That is, the intentionality in the definition of informal learning can assume either an intentional or unintentional aspect, depending on the attributes of subjects. Yet, previous studies (Evans, 2003; Mocker & Spear, 1982) did not specify the different types of subjects, making the intentionality in terms of, i.e., pre-set organizational plans or learners' purposeful actions, ambiguous. That is, learners' intentionality or unintentionality and organizational intentionality or unintentionality should be clarified. The intentionality in informal learning involves organizational unintentionality as well as learners' intentionality and/or unintentionality. It does not provide any prepared or planned curriculums and implies learners' acquisition of knowledge or information while intentionally or unintentionally engaging in learning activities in the course of fulfilling their workplace duties.

In this context, informal learning takes place without any intended organizational interventions where learners decide their learning goals in a self-directed and spontaneous manner. Furthermore, experiences at work facilitate learning, which in turn produces resources.

That is, individuals get accustomed to their workplace duties and realize the fundamentals through personal experiences based on formally learned content whilst sharing diverse experiences or expertise with superiors through conversations or observations to acquire needed information or knowledge. At the same time, individuals can learn by organizing personal experiences and deriving some meanings from those experiences on their own (Garrick, 1998). In light of the foregoing discussion, the present paper defines informal learning as learning experiences naturally arising out of workplace activities and as the acquisition of new information, knowledge, or attitudes via intentional or unintentional participation in learning activities.

Characteristics of informal learning. Contemporary discussions on the definition of informal learning consider the concept of informal learning from the perspective of informality of learning characterized by contextual dynamics instead of clarifying 'what it is, as opposed to formal learning.' Despite the diverse perspectives stated by different authors, these perspectives on informal learning have few commonalities. Watkins and Marsick (1992) characterized informal learning as follows. First, informal learning is established by a combination of actions and reflections surrounding experiences. Second, informal learning is developmental. Thus, it develops over time. Third, people can learn while working on real issues with others.

Marsick and Volpe (1999) characterized informal learning as interacting with routine life and being promoted by internal or external stimuli, unconscious and inadvertent, while emphasizing that informal learning is an inductive process of reflections and actions and inter-connected with other people's learning. Schugurensky (2000) characterized informal learning as essentially self-directed, inadvertent, social or tacit, and explicated each type of informal

learning in view of the intentionality and awareness at the moment of learning experience as follows (Merriam & Caffarella, 2007: 36):

> "Self-directed learning, for example, is intentional and conscious; incidental learning, which Marsick and Watkins (1990) describe as an accidental by-product of doing something else, is unintentional but "after the experience she or he becomes aware that some learning has taken place" (p. 4); and finally, socialization or tacit learning is neither intentional nor conscious (although we can become aware of this learning later through "retrospective recognition") (Marsick & Watkins, 1990, p. 6)."

Based on the foregoing, informal learning is characterized by self-directedness, reflections, routineness, context-orientedness, unintentionality and interactivity, and it should be defined in line with endogenous attributes of learning elements in lieu of being compared with formal learning. Malcolm, Hodkinson, and Colley (2003), who argued that each learning context should be viewed based on the analysis of informality and formality from the four perspectives, as in Table 2-3, proposed the definition of informal learning in terms of the endogenous attributes of learning elements.

Table 2-3.

Formality and informality of learning (adapted from Malcolm, Hodkinson, & Colley, 2003: 315-316)

	Informality	**Formality**
Process	• Inadvertent learning process in routine everyday activities • More democratic consultation directed by learners • Friends or colleagues serve as instructors • Informal or formative in the presence of evaluation, or relatively informal in case of negotiated evaluation.	• Learners do structured assignments given by teachers • Controlled didactic and pedagogic approaches are taken by teachers • When teachers are instructors, the learning is formal. When industrial instructors, trained mentors or student counselors are involved, the learning is less formal • Evaluation is mostly summative
Setting	• Material settings for learning are workplace, communities or families • Learning materials are set to be open without 'time constraints, curriculums, preset learning goals or certificates'	• Material settings for learning are schools or campuses • Learning materials have 'time constraints, curriculums, preset learning goals or formal certificates
Goal	• Workplace productivity and other goals are prioritized with learning being unintended outcomes • Learners decide and create learning goals	• Learning is the preferred and planned focus of activities • Learning goals are determined mostly by teachers, evaluation offices or any other external entities
Content	• The essence of learning is to develop something new • Learning is focused on routine practices or workplace competencies	• Proven professional knowledge, understanding and practices are acquired as the essence of learning • Declaratory or vertical knowledge is the focus of learning

Meanwhile, concerning the intrinsic limitations of the definition and characteristics of informal learning, Reardon (2004) pointed out the informal learning took time, arose out of horizontal relationships with colleagues rather than some vertical ones with superiors, and showed the tendency of learners to learn only what they needed due to the absence of institutionalized goals or content. Additionally, Dale and Bell (1999) outlined the drawbacks of informal learning as follows. First, as the knowledge that is informally learned has shallow bases, informal learning often encompasses learning particular parts or superficial skills. Second, as individuals often fail to perceive that they have learned something, informal learning is unlikely to contribute to building up self-confidence or further development. Third, something informally learned is unlikely to be recognized or accredited. Fourth, bad habits or improper practices may be passed down through informal learning.

Concerns were raised over the formalization of informal learning. Garrick (1998) compared informal learning to Foucault's panopticon, arguing that informal learning is nothing more than a controller for self-regulation under the system prescribed by a head office. Similarly, Jeong (2000) remarked that discussions on workplace informal learning focused on 'prescriptive discussions' concerning how to encourage and facilitate informal learning rather than how to explain the phenomena of informal learning, criticizing the tendency of educational training programs to link formal educational institutions and informal learning and to provide certification of informal learning. The key criticism is that although informal learning is significant in that it presents the potential to connect learning with 'life' by valuing workers' experiences, it ends up being an instrument serving the purpose of financial improvement, which is attributable to the coupling of learning and standards for skills.

The foregoing limitations and issues warrant further research on informal learning from more diverse perspectives.

Literature on Nurses' Informal Learning

The present analysis of recent doctorate dissertations on informal learning published since 2000 sheds light on the following.

First, informal learning was investigated in the workplace settings of mostly 'large enterprises and manufacturers' instead of a range of workplace settings. Moran (2003) explored the informal learning strategies used by employees working at the manufacturing lines. Mau (2002) reported on the informal learning performed by those surviving the restructuring in two global manufacturers. Trochiano (2002) focused on the informal learning strategies of survivors succeeding in career management in the course of restructuring of a large telephone company in the US. Enos (2001) described the roles of informal learning in the development of skills among managers working for a large insurance company. Wagner (2000) surveyed the effects of computer technology as a strategic tool for informal learning among employees in charge of technology instructions in a cutting-edge large enterprise. Sloan (2002) studied 9 CEOs of three large enterprises regarding the informal learning in management strategy development. As the authors suggested, further studies should include more diverse industries and different companies of different sizes to better understand the dynamics of informal learning susceptible to contextual effects.

Second, most previous studies have focused on the effects of informal learning on organizational performance improvement and relevant activities, e.g., 'management strategy

development, job competency development, and career management.' Workplace informal

learning is significantly associated with organizational outcomes, as demonstrated in a large-

scale report on workplace learning (Dale et al., 1999; Leslie et al., 1998). Given that workplace

learning aims to improve organizational performance and outcomes, it is natural that

organizational performance and outcomes are considered significant in research on informal

learning. That said, only few studies have paid attention to organizational members' pivotal roles

in bringing organizational outcomes, the reasons for their engagement in informal learning, and

the ways in which informal learning process is implemented. Adult learners are primarily

characterized by self-directedness (Knowles, 1975), which is closely related to personal goals

combined with the motives and needs for engagement. Therefore, to promote adult learners'

workplace learning, it is necessary to investigate the goals and process of informal learning

among adult learners.

Although it is difficult to find doctorate dissertations on nurses' informal learning, recent

findings are characterized by the following.

First, regarding the research methods, most previous studies are qualitative case studies

involving particularly individual interviews for data collection in addition to critical incident

questionnaires (Rossi, 1995; Troyan, 1996) and written interviews (Murray, 1993). Second,

participants ranged from nursing managers to clinical nurses were included. Murray (1993)

surveyed 20 APNs promoted to the first-line managers from clinical nurses. Rossi (1995)

included 23 nurses working for university hospitals. Additionally, Troyan (1996) surveyed 20

nursing managers working for small-and-medium-sized Catholic hospitals. Third, previous

studies paid attention mostly to the informal learning routes through which nurses acquired

necessary professional skills. Troyan (1996) and Rossi (1995) investigated the effects of specific informal learning activities on work-related learning, organization-related learning, and personal learning. Furthermore, Murray (1993) explored the way in which informal learning led to real learning outcomes. Fourth, regarding the results, workplace informal learning has shown to be effective for developing competencies. Murray (1993) highlighted primary learning methods, e.g., self-directed learning, role modeling, networking, and mentoring, whilst Troyan (1996) and Rossi (1995) stressed learning through trials and errors.

Leyden (2004) delved into the association of informal learning among doctors with those of nurses. Leyden (2004) conducted an analytical study of 15 doctors working for federal medical centers to cast light on what and how they learned to treat patients with depression. With the 3-step model based on the reflective learning suggested by Boud and Walker (1992), the author analyzed the process of preparation, experience, and reevaluation. The results suggested that the doctors mixed formal with informal learning approaches according to the abovementioned three steps, focusing on communication skills, which played core roles. Notably, doctors learned from successful experiences with patients and interactions with their families, which suggested that doctors learned mostly from interactions with memorable patients.

These studies established the factors that promoted informal learning as well as the contents and types of informal learning among the staff in hospital settings. Yet, they left much to be desired by not characterizing the specific dynamics of informal learning process and relevant attributes and not seeking viable measures to encourage informal learning.

The foregoing previous studies have some implications for the present study on informal learning, i.e., research on informal learning should promote workplace learning of adult learners,

and diverse types of companies should be included to establish the factors affecting adult learners' informal learning and the dynamics of learning process.

Relationship between Informal Learning and Individual-level Variables

Previous studies on informal learning proved (Bahn, 2007; Boud, 1999; Boud & Middleton, 2003; Garrick, 1998; Li, 2001; Lohman, 2006; Lynch & Black, 1998; Lohman, 2006, 2009) the individual-level factors relevant to informal learning, e.g. demographics, job characteristics, motivation for learning, interpersonal relationship, self-efficacy, and the capability to use tools for learning. Individual-level factors are sub-divided into general and socio-psychological attributes. Demographics and job characteristics are objective attributes, or general characteristics, whilst motivation for learning, interpersonal relationship, and self-efficacy conditioned by social accountability or personal psychology are subsumed under the socio-psychological attributes.

The advent of learning organizations contributed to the extensive discussions on workplace learning, including informal learning and relevant research. Most previous studies focused on organizational characteristics of workplace learning and their relationship with workplace learning. Yet, few studies explored personal attributes in workplace informal learning. Considering that organizational learning postulates personal learning (Argyris & Schön, 1981; Nonaka, 1994), individual-level factors are important for informal learning.

Notably, demographics, among other individual-level variables, refer to one's objective attributes, unlike the learning abilities or socio-psychological states of corporate employees, and include gender, age, education, rank, terms of service, and affiliation. Although recent research

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on adult learning presented different opinions on statistical significance, demographics is the most frequently used individual-level variable (Moon, 2006) because individuals determine the methods and contents of learning based on personal situational variables, experiences or other personal traits (Billet, 2001). However, results vary in that demographics have been found to have some or no effects on informal learning (Grolnoc, 2001; Rowden, 2002).

The present study will investigate the effects of demographics as the control variable and individual-level variables, e.g., job characteristics (task variation and task significance) and socio-psychological attributes (motivation for learning and interpersonal relationship).

Job Characteristics

The job characteristic theory suggested by Hackman and Oldham emerged to make up for the limited job enrichment theory of Herzberg (1977). According to the job enrichment theory, enriched jobs imposed upon individuals enhance the challenging spirits and responsibility for jobs with qualitative job enrichment, helping secure a sense of achievement and stability, motivating employees, and increasing performance (Kivimäki, Voutilainen, & Koskinen, 1995; Loher et al., 1985).

Workplace learning may arise out of routine and non-routine jobs. Workplace learning activities were classified based on job characteristics (Billett, 2001). Marsick and Volpe (1999) characterized informal learning as opposed to formal learning by its close association with routine jobs. Jeon and Kim (2012) reported that job characteristics had the potential to provide individuals with the opportunity for informal learning. Meanwhile, a study measured the informal learning in two groups that had jobs with different characteristics (Lohman, 2005) and

found significant differences between groups, which suggests that job characteristics exert effects on informal learning. Turner and Lawrence (1965) first classified job characteristics into the following: ① variety, ② autonomy, ③ required interaction, ④ optional interaction, ⑤ knowledge and skill required, and ⑥ responsibility. They suggested that job characteristics were closely related to job satisfaction and motivation. Thus, job characteristics were reported widely as the factors influencing personal learning (Doormbos, Simons, & Denessen, 2008; Ellström, 2001; Kwakman, 2003).

Following Turner and Lawrence (1965), Hackman and Lawler (1971) defined four components of job characteristics, i.e., ① skill variety, ② task identity, ③ autonomy, and ④ feedback. Later on, Hackman and Oldman (1975, 1980) added the task significance and suggested 5 characteristic job factors. To be specific, first, in view of skill variety, activities that require workers to use diverse skills and capabilities to perform their jobs make them feel that their tasks more meaningful. In the same vein, jobs that require higher skill levels help workers perceive their jobs as more significant. Second, task identity refers to the extent to which workers participate in the course of performing jobs. People assume general rather than partial responsibility for jobs as more significant. Third, autonomy refers to the freedom, independence, and discretion in making decisions about job performance, schedules and procedures. Fourth, feedback refers to the extent to which workers can acquire information about job performance while carrying out their tasks. Finally, the task significance refers to the extent to which workers' jobs affect internal and external organizations or the life of people in the wider society.

Doornbos et al. (2008) investigated job characteristics as the variables associated with informal learning and sub-divided job characteristics into three attributes, i.e., task variation, task

autonomy, and work pressure. Task variation refers to the extent to which new challenging tasks are allotted to workers. Informal learning is reinforced by task variation. Ellström (2001) remarked that task variation boosted organizational learning. Task autonomy refers to the extent to which workplace learners themselves can control the process of performing the given tasks (Doornbos et al., 2008). Those who perceived the task autonomy were found to freely decide on the method and process of performing the tasks, whereas those who hardly perceived the task autonomy failed to make any relevant decision (Ellström, 2001). Still, task autonomy is considered as a form of organizational leadership or empowerment rather than the job characteristics. Previous findings on task autonomy were inconclusive regarding whether to include feedback and autonomy as part of job characteristics. Additionally, some empirical studies reported that the task autonomy did not significantly influence professional learning activities or reflective activities (Kwakman, 2003; van Woerkman, 2003). Work pressure refers to the extent to which workers perceive that they should complete their tasks fast (Doornbos et al., 2008). Paulsson, Ivergard, and Hunt (2005) found that work pressure did not exert significant effects on informal learning.

Based on the previous findings, job characteristics correlate with the emergence of learning. Accordingly, research on objective characteristics of jobs associated with learning is needed. Yet, despite the findings that job characteristics affect the informal learning, specific characteristics that affect informal learning directly are hardly known (Ellström, 2001). As jobs are given mostly to individuals by organizations instead of being chosen as per personal intentions, the present study measured the levels of task variation and task significance to shed light on their hierarchical relationship with informal learning.

Task variation. Task variation refers to the extent to which one encounters exceptional events in the course of performing jobs (Perrow, 1967). That is, task variation concerns not only routine simple jobs, but also variable ones to which a range of different methods could be applied. In contrast, when given jobs are repetitive and unexceptional, the work process is functionally automated, saving workers time and energy (Nembhard & Osothsilp, 2002). Such repetitive and automated jobs are far from expanding the scope of one's jobs, preventing workers from acquiring new skills or knowledge (Gersick & Hackman, 1990) because learning opportunities emerge when workers are faced with new demands in their work process (Ellström, 2001).

Many previous studies invariably suggested the positive effects of task variation on informal learning (Billett, 2001; Kwakman, 2003; McCauley, Ruderman, Ohlott, & Morrow, 1994; van Woerkom, Nijhof, & Nieuwenhuis, 2002). Specifically, research on skill variety (Hackman & Lawler, 1971; Hackman & Oldman, 1975, 1980) elucidated that jobs, which required workers to use diverse skills or abilities as well as new or challenging jobs, made workers perceive their tasks as significant. Furthermore, those who performed tasks with high levels of skills viewed their jobs as more significant, which exerted positive effects on informal learning. Doornbos et al. (2008) investigated job characteristics as the factors associated with informal learning and reported task variation, referring to the extent to which new challenging jobs are allotted to workers, proportionately reinforced informal learning while Ellström (2001) indicated that task variation promoted organizational learning.

Regarding the professional skill learning among knowledge workers in information and communication industry, Jeong (2005) observed that the increasing needs for learning in the

information and communication sector were attributed to the rapid change of technology and the

short lifespan of relevant knowledge or skills. This suggests that the task variation involving

non-repetitive new challenges imparts significant meanings to jobs, leading to active informal

learning. Relatively variable and complex tasks typically conducted by highly educated or highly

skilled workers proved conducive to workers' performance and learning (Lee, Rainey, & Chun,

2010).

In short, task variation focuses on the extent to which a task requires a worker to display

diverse skills and abilities. Tasks that require such skills and abilities are considered variable.

Furthermore, direct and indirect experiential learning activities and self-directed personal

learning activities increase informal learning, as one perceives he/she is required to experience

new tasks, deal with various tasks, and apply various methods.

Task significance. Hackman and Oldham (1975, 1980) first defined task significance as

the extent to which a task has significant effects on people inside and outside of an organization

(Hackman & Oldham, 1975). The rapid change in management environment has increased the

internal and external effects of jobs performed by organizational members. When one perceives

that his/her job influences other people or entities outside his/her organization, the person will

become more interested in and responsible for the job, ensuing job-related learning. Therefore,

task significance means one's perception of the importance of his/her job rather than the effects

of his/her performance within an organization.

Jeon and Kim (2012) reported that informal learning was conditioned by the perception

that the knowledge or skills currently used to perform certain jobs would be applicable to other

organizations. Mao, Hsieh, and Chen (2012) mentioned that the perception of the importance of

a job enhances self-directed learning largely because knowing that the outcomes of a job influences others' happiness, health, or safety should make one pay extra attention to the job. Hirschfeld, Schmitt, and Bedeian (2002) asserted that since the people's perception of their jobs as being important was likely to meet their needs for competency, dealing with jobs of higher task significance could improve performance when all other conditions remained equal.

To recap, task significance is defined as the extent to which a task is perceived as important by workers as a result of their jobs having positive effects on the organization, other external organizations, and others as well as themselves. Workers' perception of their jobs as being influential and extensible to others increases their accountability for and interest in the jobs, which has positive effects on self-directed and informal learning because people tend to care about their jobs more when they perceive that their jobs influence others or other organizations.

Socio-psychological Characteristics

Job characteristics are extrinsic factors given to individuals in an organization, whereas socio-psychological characteristics are intrinsic factors of a person. Previous studies on informal learning (Christina, 2001; Ellinger, 2005; Li, 2001; Steward, 1996) suggested socio-psychological characteristics, such as motivation for learning, interpersonal relationship, self-efficacy, and social networks, as intrinsic factors.

Socio-psychological characteristics have been extensively investigated in the context of informal learning. Yet, opinions concerning the effects of socio-psychological characteristics on informal learning vary. Above all, motivation has found to mediate the relationship between self-

efficacy and informal learning (Lohman, 2006). Social network has been proven to affect informal learning, but it has been regarded as a factor comparable to the interpersonal relationship (Christina, 2001; Li, 2001).

Based on the previous findings, informal learning is not structured or formal, and thus calls for the motivation of learners to learn (Eraut, 2004; Lohman, 2006). As informal learning arises out of natural contacts with colleagues at work, interpersonal and human relationships serve as important factors (Stweart & McGoldrick, 1996). Therefore, the present study considers the interpersonal relationship and the motivation to learn among other socio-psychological characteristics that affect informal learning.

Interpersonal relationship. Heider (1964) defined interpersonal relationship in terms of how one thinks and feels of others, how one perceives others, how one behaves towards others, what one expects others to do or think, and how one reacts to others' actions. Madsen et al. (2005) defined learners' interpersonal relationship in workplace learning as one's feelings, attitudes or perception of other members (superiors, subordinates and colleagues) directly or indirectly working with them.

Definitions of interpersonal relationship in the workplace vary with authors. Mostly, previous studies conceptualized the interpersonal relationship in workplace settings as 'workplace friendship' (Nielsen, Jex & Adams, 2000; Riordan & Griffeth, 1995; Song, 2006) and as 'intimacy' (Hu & Smith, 2004).

First, workplace friendship refers to human relationship that triggers the intimacy and positive influence among organizational members (Jehn & Shah, 1997). The concept of

workplace friendship was raised as an alternative to delve into the social and psychological

relations of individuals in the leader-member exchange (LMX) theory discussed in the leadership

theory (Song, 2006). Second, intimacy refers to the extent to which organization members feel a

sense of solidarity. Although researchers have defined the concepts of intimacy, a consensus

suggests that the primary factor of intimacy is to open the hearts towards one another and to give

emotional support (Harper, Schaalje, & Sandberg, 2000; Hu & Smith, 2004; Moss & Schwebel,

1993; Tolstedt & Stokes, 1983).

Regarding previous studies on informal learning and interpersonal relationship, informal

learning is closely associated with learners' sociality (Garrick, 1998). Therefore, interpersonal

relationship is considered the most important factor in personal learning and development of

organizational members in addition to organizational goal achievement (Stweart & McGoldrick,

1996). Since informal learning frequently occurs via interactions with others rather than

individual-level activities, conversations with others, inquiries, observations, imitations, and

relationship with others are its important determinants (Lohman, 2006). Doornbos et al. (2008)

observed that even activities of workplace learning seemingly conducted on one's own proved

meaningful through indirect social interactions and suggested that all interactions with others laid

the foundation for all informal learning. Berman et al. (2002) surveyed public employees in the

US and reported that those who had the workplace friendship within the organization found it

easy to cooperate with or support others, improved organizational atmosphere and

communication, and overcome task-related difficulties. Li (2001) reported that the intimacy

between workers and managers had significant effects on librarians' learning process. Christina

(2001) asserted that personal learning and learning transfer were conditioned by inter-dependent

inter-personal relationships among organizational members. Many previous reports (Boyd &

Taylor, 1998; Landy & Becker, 1987; Marsick & Volpe, 1999) demonstrated that building friendship and trust at work caused workers to have positive attitudes towards tasks and increased productivity.

In brief, interpersonal relationship involves workplace friendship that makes organizational members feel a sense of bond and the intimacy that enables them to open their hearts mutually and give emotional support. Hence, the present study defines the interpersonal relationship as the attitude towards or perception of organizational members (e.g., superiors, colleagues and subordinates) who work together in the workplace directly and indirectly. In addition, informal learning involves the interactions with others and others' learning, which warrants research on the effects of the interpersonal relationship on informal learning.

Motivation for learning. Some theories combine the human motivation theory from psychology with learning to account for the motivation for learning, e.g., behaviorism in the 1900s, humanitarianism in the 1940s, and cognitivism in the 1960s. The motivation for learning in the behaviorist theory focuses on human actions and extrinsic motives, such as compensation and punishment. In contrast, in the humanitarian theory, learning is motivated through encouraging self-esteem, autonomy, and self-realization by emphasizing individual learners' intrinsic motives. The motivation to learn in the cognitive theory is based on the belief that one's way of thinking determines actions (Woolfolk, 2001). The cognitive approach characterizes the contemporary motivation theory. Depending on the focus of each theory, there are goal setting theory (Locke & Latham, 1990), achievement motivation theory (Atkinson, 1964), achievement goal-orientation theory (Ames, 1992), and attribution theory (Weiner, 1979).

Given the low intentionality of learners and continuity of informal learning, not only the motivation to learn but also the motivation to continue and reinforce learning is important (Parisa, 1997). Tough (1978) proved that out of job-related needs, adult learners carried out or engaged in self-directed learning. That is, individuals act out of the belief that various workplace activities will bring about significant outcomes (Vroom, 1964). This perspective is part of the expectancy theory, which is one of the learning motivation theories. Adult learners engage in learning based on intrinsic motivation (Knowles, Holton, & Swanson, 1998) as well as the extrinsic motivation related to the outcomes of learning, e.g., self-development, employment, improvement of job performance, and certification (Sargant, 2001).

Sambrook and Stewart (2000) investigated the factors influencing the workplace learning at the levels of individuals, organizational functions, and organizations, and proved the individual-level motivation to learn served as the most significant factor. Schunk (1991) found that those who were highly motivated to learn engaged in activities that were likely to help their learning. Zimmerman and Martinez-Pons (1990) reported that people who are highly motivated to learn often double-checked their levels of understanding and asked for help to better understand what they were learning.

To sum up, workplace learners are motivated to engage in learning exogenously by organizational goals. To paraphrase, although individuals may be interested in learning activities per se and endogenously motivated to engage in learning, the exogenous motives to learn, such as organizational goals, promotions, or outcomes, should not be neglected. An increasing number of studies on adult learners divided the goal-oriented motivation to learn into workplace

performance orientation and learning orientation for the sake of measurements. The goal-oriented motivation to learn is emphasized in relation to corporate workers.

In line with the sub-division of motivation to learn, as suggested by Zusho and Pintrich (2009), the present study focuses on the performance orientation and learning orientation factors. Performance orientation means that one is motivated to engage in learning with much interest in the assessment of one's capabilities to obtain results superior to others. Learning orientation means that one is motivated to engage in learning to improve one's capability. The motivation factors of informal learning are hardly spontaneous but involve organizational goals, competition with colleagues, personal willingness and commitment. Thus, not only the motive to pay attention to learning per se, but also the motive for the interest in assessments by others is important, which is why the performance- and learning-level motives are not worth investigating.

Relationship between Informal Learning and Organizational-level Variables

Illeris (2004) stated that workplace learning was conditioned by the interactions between learners' learning process and environmental elements affecting their learning. As learning is influenced by the unique characteristics of organizations to which individuals belong, the organizational characteristics in the course of learning may serve as the factors that facilitate or hinder learning. Organizational characteristics constitute a comprehensive concept encompassing the material organizational settings, structural characteristics, attitudes, norms, policies, practices, values, and other procedural aspects. Previous studies dealt with organizational factors of informal learning, e.g., empowerment, perceived organizational support, learning-committed leadership, open communication, and accessibility to colleagues.

Many previous studies on informal learning (Clarke, 2005; Enos et al., 2003; Knowles, 1950; Sambrook & Stewart, 2000) stressed the roles of leaders. Learning and skill acquisition can be facilitated when individual-level factors, including learners' motivation to learn, interact with the support for learning from leaders (Ashton, 2004). The role of leadership is to set up the organizational environment conducive to learning. Clarke (2005) investigated the effects of learning environment in a healthcare center on learning outcomes and showed significant effects of superiors' empowerment behavior and organizational communication. In addition to providing opportunities for organizational members to make decisions on their own and to proceed with tasks in person, leaders should create an organizational culture for open communication. As informal learning arises out of natural conversations and information sharing with colleagues, it is important to create an organizational communication culture to facilitate honest expression of thoughts and opinions regardless of organizational ranks or other individual aspects (Abbey, 1999). Enos et al. (2003) described informal learning in light of three elements, i.e., support from colleagues, superiors, and organizations, verifying their correlation with the ethos of learning transfer, and found the support from superiors and organizations had significant effects on the level of informal learning.

Other factors have been reported to be associated with informal learning, including risk taking (Abbey, 1999; Chiva-Gomez, 2004; Skule, 2004), shared visions (Abbey, 1999), contact with external environment (Abbey, 1999; Skule, 2004), open communication (Abbey, 1999; Chiva-Gomez. 2004), horizontal hierarchy, diversity, knowledge transfer, mutual collaboration (Chiva-Gomez. 2004), and openness towards demands (Skule, 2004). Based on the results, the organizational factors are significant factors in facilitating informal learning. Moreover, according to studies on motivation to learn that included the individual-level variables associated

with informal learning, the motivation to learn does not arise without any stimuli but results from interactions with contexts. In particular, since many studies have emphasized the influence of environmental factors in motivating learners, the relation between individual- and organization-level factors is worth investigating.

Empowerment

The concept of empowerment emerged in the 1940s along with a series of prominent shifts of consciousness in politics and sociology, e.g., civil rights movement, blacks' right to vote, union activities, civil rights groups, and emancipation of women (Vogt & Murell, 1990). In the past, power was considered to decrease once it was given to others (Park & Kim, 2012). Lately, groups and organizations have discussed empowerment from the perspective that organizational members spontaneously feel empowered through power sharing.

Regarding the conceptualization of empowerment, Greenberg (1993) defined empowerment as the opportunity for organizational members to manage how to perform their jobs on their own. McClelland (1975) viewed empowerment as a process of implanting self-confidence rather than power distribution. Bandura (1977) considered self-efficacy as a key element of empowerment defined as a process of boosting the self-confidence in one's capability to perform the given tasks successfully. Conger and Kanungo (1988) first conceptualized the psychological empowerment and asserted that seamless formal and informal empowerment within an organization drove lower-ranking employees to feel self-efficacy or self-confidence and belief. Empowerment leads to self-confidence in task performance. Therefore, individuals do not only accept tasks, but also exert efforts to perform their tasks. Psychological empowerment increases the self-efficacy of organizational members and dissipates helplessness, which

influences members' performance and then increases their self-efficacy, forming a virtuous circle (Lindsley, Brass, & Thomas, 1995).

The definitions in general involve giving organizational members some power or authority to achieve certain goals (Baker & Hubbard, 2003; Moers, 2006) and psychological empowerment. That is to say, organizational members are given both material and psychological power to be confident in their capabilities, perform tasks more freely, and exert effects on organizational performance.

Meanwhile, given the fact that the empowerment measures failed to prove the relationship between empowerment behavior and psychological empowerment in Konczak, Stelly, and Trusty (2000), an instrument called LEBQ (Leader Empowering Behavior Questionnaire) was developed to measure the perception of superiors' empowerment behavior. This instrument consists of 17 items assessing 6 empowerment actions of superiors, i.e., delegation of authority, accountability, self-directed decision making, information sharing, skill development, and coaching for innovative performance. This instrument is intended to develop superiors' empowerment skills. Since superiors' empowerment actions affect subordinates' psychological empowerment directly, the rationale behind the developed instrument is that organization-level management and coaching should be applied to superiors' empowerment actions.

Concerning the relationship between informal learning and empowerment, prior studies (Abbey, 1999; Chiva-Gomez, 2004; Clarke, 2005; Marquardt & Reynolds, 1994) demonstrated that empowerment had significant effects on informal learning. Abbey (1999) analyzed the effects of organization-level variables on informal learning, focusing on engagement and

empowerment as primary organizational characteristics of a quantitative study. They found that engagement and empowerment had significant effects on informal learning, with empowerment exerting the most significant effects among the six organization-level variables.

Chiva-Gomez (2004) investigated the factors that boosted learning in four companies and found that engagement and empowerment actively took place in two companies where organizational members most actively engaged in learning. Clarke (2005) explored the effects of workplace learning environment on learning outcomes in a healthcare center. The author defined the outcomes of workplace learning as the extent of acquisition of procedural knowledge and conducted a questionnaire survey on the effects of five workplace learning settings. The findings indicated that empowerment and communication were significant factors. Marquardt and Reynolds (1994) reported that the delegation of power and capability influenced the informal learning among 11 essential organizational elements for global learning.

In short, one should not jump to the conclusion that the delegation of material power, psychological empowerment, and diverse similar concepts influence organizational members' learning in all cases. To boost informal learning, a leader should enable organizational members to act in a self-directed manner instead of insisting on the authoritarian leadership and facilitate the spontaneous emergence of job-related learning. Hence, leadership behavior should vary with the characteristics of organizational members.

Learning-committed Leadership

Learning-committed leadership refers to helping employees set up learning goals, offering advice, presenting role models, and providing positive feedback about application of

new knowledge or skills, which involves the entire spectrum of leadership behavior (Russ-Eft, 2002).

Informal learning arises unconsciously and unintentionally. In this sense, an organizational culture committed to learning has significant effects on the emergence of learning. Particularly, for organizational learning to emerge, the organization needs a committed leadership rather than an authoritative leader taking advantage of the hierarchical order (Chiva-Gomez, 2004; Zucchi & Edwards, 2000). To implement the learning-committed leadership, a leader should act as a facilitator who poses questions and provides opportunities for organizational members to engage in perceived learning (Knowles, 1950). Moreover, the most significant role of a leader is to provide sufficient learning resources to organizational members (Christina, 2001). Hence, a leader with learning-committed leadership should encourage organizational members to go forward relentlessly and help them find their potentialities (Rogers, 1977).

As the instrument for measuring the learning-committed leadership, the seven sub-types of learning-committed leaders suggested by Ellinger (2005) are used. The seven attributes of learning-committed leadership presented in the instrument are as follows. First, the leader sees to it that organizational members have diverse opportunities for learning through discussions or conversations at work. Second, the leader provides organizational members with detailed explanation about their inquiries. Third, a leader waits for organization members to make decisions based on their reflections and supports their decisions. Fourth, a leader gives organizational members an opportunity to ponder upon their mistakes so that they can learn in the face of failures and risks. Fifth, a leader facilitates an organizational atmosphere where

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members can share knowledge with their colleagues and learn from one another. Sixth, a leader gives positive feedback on the performance of organizational members. Seventh, a leader should be an influential role model of organizational learning.

The role of a team leader is to create a learning culture that overrides any other factors to encourage the informal learning (Knowles, 1950). Rothwell (2002) asserted that organizations should prioritize the learning-committed leadership, e.g., open-mindedness towards learning, the time spent on learning experiences of organizational members and financial support, and learning. In addition, the sub-items of the learning-committed leadership included the provision of learning opportunities and time for learning. Thus, informal learning will not be available unless a leader provides organizational members with continuous opportunities for learning or for reflecting on the contents informally acquired through given tasks.

Perceived Organizational Support

Eisenberger, Juntington, Hutchison, and Sowa (1986) first suggested perceived Organizational Support (POS) as a concept connoting the extent to which an organization is committed to its members. That is, perceived organizational support refers to the overall perception that an organization cares about the welfare of organizational members, including recognition and rewards (Eisenberger et al., 1986, 1997). Organizational commitment refers to organization members being committed to their organization (Mowday, Porter, & Steers, 1982), whereas the perceived organizational support refers to an organization being committed to its members.

In the past, organizational support, defined as interacting relationships between an organization and its members, focused only on financial rewards. By contrast, the definition of organizational support has recently been extended to include the extent to which organization members perceive that their organization considers the value of their contribution and their happiness (Panaccio & Vandenberghe, 2009). Once organizational members positively perceive the organizational support, they feel emotionally attached to their tasks, and the attachment leads to task-related learning. Depending on the perception of how an organization values them, organizational members show the attitudes or actions that benefit the organization as part of social exchange (Rhoades & Eisenberger, 2002). In the same vein, organizational members are motivated to learn when they feel the workplace environment is agreeable to them (Noe, 1986).

The elements of perceived organizational support include financial support (Guzzo, Yost, Campbell, & Shea, 1994), training and educational support, promotion (Wayne, Shore, & Liden, 1997), fairness (Moorman & Niehoff, 1998), communication (Allen & Katz, 1992), engagement in decision making (Hutchison & Garstka, 1996), autonomy (Aubé, Rousseau, & Morin, 2007), and feedback (Hutchison & Garstka, 1996). In lieu of material rewards or financial support, social support may be considered significant. Therefore, organizational support involves not just material rewards, but also psychological support, e.g., compliments and recognition.

The instrument used to measure the perceived organizational support consists of 36 items developed by Eisenberger et al. (1986). Seventeen out of the 36 items can measure the perceived organizational support.

Research on learning (Ashton, 2004; Eisenberger et al., 1986; Enos et al., 2003; Sambrook & Stewart, 2000; Skule, 2004) proved that the perceived team support had significant

effects on learning. Sambrook and Stewart (2000) surveyed top managers, HRD experts, and employees regarding the factors that would influence the workplace learning and found that the organizational support had positive effects on learning. Regarding the structural factors affecting learning and skill acquisition, Ashton (2004) reported the support for learning and tasks as the major factors. Enos et al. (2003) investigated the relationship between informal learning and learning transfer by analyzing the relationship between the learning transfer climates, the extent of informal learning, and the learning transfer and presented novel implications. The authors analyzed the extent of informal learning in terms of the support from colleagues, superiors, and the organization to verify the correlation with learning transfer climates. The findings indicated that the support from superiors and the organizational support had significant effects on the extent of informal learning.

Openness of Team's Communication

From the perspective of organization theory, the communication in an organization, or organizational communication refers to all aspects of communication arising in an organization. Communicative actions involve verbal and non-verbal means used in communication and all other activities of communication intended to empathize with organizational members. The openness of team's communication in this study connotes the communicative actions arising in a team and indicates the extent to which all communicative activities within a team can develop a bond of sympathy among members (Crino & White, 1981).

From the perspective of human relations, informal communication in an organization or a team was used to identify organizational members' psychological traits, which were considered to influence the efficiency of the organization or the team. Thus, many organizations draw on

informal communication to emphasize the horizontal communication within an organization or a team and the openness of team's communication.

Robbins (1996) introduced three factors affecting the communication in an organization. First, the top management should convince organization members that organizational goals could be achieved through communication. Second, the leader should honestly communicate even disagreeable news. Third, the leader should encourage members to share information promptly. To apply the three elements to a team, a team leader should convince team members that the team's goals could be achieved through communication, communicate the team's issues and those of the organization honestly, and ensure the openness of communication in the team so that team members can promptly share information.

The instrument developed by Hyatt and Ruddy (1997) to measure communication was used to investigate the relationship between the effectiveness of team's communication and outcomes with 150 members from 30 teams. This instrument consists of 6 items assessing the openness of communication as an effective method of communication among team members. The result showed that teams that perceived high openness of team's communication to seamless effective communication showed better performance and outcomes.

Previous studies on learning (Abbey, 1999; Chiva-Gomez, 2004; Education Development Center, 1998; Gardner, 1989) invariably demonstrated significant effects of learning on communication. Based on previous reports that the effectiveness of organizational communication had direct effects on the readiness for self-directed learning in an organization (Abbey, 1999; Gardner, 1989), organizational members can cope with conflicts through communication and interact with one another for informal learning. Argyris and Schön (1981)

remarked that the improvement in communication among organizational members helped them share knowledge and implement learning. The types of communication and the openness of organizational communication facilitate workplace learning, which is conducive to organizational members' task performance. In addition, Chiva-Gomez (2004) reported that the seamless organizational communication had positive effects on workplace learning.

Informal learning is based on trials and errors in task performance, conversations with others, and interactions, including inquiries. Therefore, when an organizational communication culture allows its members to easily approach one another for inquiries and help, active informal learning takes place. When an organization is hierarchical and conservative or does not allow its members to communicate with one another due to too much workload and thus time constraints, informal learning is hardly available. Therefore, organizational communication culture, including norms, beliefs, and practices, are significant factors influencing the informal learning (EDC, 1998), which is generated spontaneously when organization members are free from psychological burdens in the workplace and perceive that the culture supporting free communication has been established.

CHAPTER 3: METHODS

Research Design

This study aims to identify the hierarchical relationship among informal learning, individual level variables, and team level variables in nurses. In this study, dependent variable is informal learning level and independent variables are individual level and organizational level variables. Individual level variables include task variety and task significance as job characteristics and learning motivation and relationships with others as socio-psychological characteristics. Organizational level variable includes empowerment, learning-committed leadership, perception of team's support, and openness of team's communication.

Independent variable includes demographic characteristic, job characteristic, and socio-psychological characteristic as individual level (Level 1) variables and organizational characteristic includes hierarchical data structure as group level (Level 2) variable. In other words, task variety, task significance, learning motivation, and interpersonal relation as individual level variables refer to variables with independent characteristics (scores) at an individual level, regardless of the group to which one belongs. On the other hand, empowerment, learning-committed leadership, perception of team's support, and openness of team's communication, as organizational level variables, are interdependent in that the results of responses from the employees within the same organization reflect the characteristics of the organization, although individual employees have independent characteristics from the scores of the employees in other organizations (Raudenbush & Bryk, 2002). In this respect, task variety, task significance, interpersonal relation, and learning motivation, as individual level variables, are analyzed as the data with distinct values at the individual level, whereas empowerment,

learning-committed leadership, perception of team's support, and openness of team's communication, as organizational level variables, were analyzed as data with only one value at the organizational level.

This study conducted a Hierarchical Linear Model (HLM) analysis to understand the relationship between the variables in hierarchical structure consisting of individual level variables and organizational level variables. To this end, this study did not input independent variables into within-group model and between-group model; instead, it successively set the Null Model with informal learning as dependent variable and group classification, Mean Model with individual variables, and Explanatory Model with both individual variables and organizational variables.

First, Null Model (One-Way ANOVA with Random Effects) is a minimum model with informal learning as dependent variable and group classification only without inputting independent variables into within-group model and between-group model. Through this model, variation in informal learning was divided at the individual level and organizational level, and within-group coefficient of correlation (ICC) was drawn to identify whether nurse's information learning level depends on organization.

Next, Mean Model (Random-Coefficients Regression Model) is designed to identify the effects of individual level variables on informal learning and thus individual level variables, such as demographic characteristics, task variety, task significance, learning motivation, and interpersonal relation and independent variables were not input into between-group model. In this model, the effects of individual level variables on informal learning were examined.

Explanatory Model (Intercepts- and Slopes-as-Outcomes Model) is a model in which individual level independent variables are input into the between-group model and organizational level independent variables, such as empowerment, learning-committed leadership, perception of team's support, and openness of team's communication, organizational characteristics were input into the between-group model. In this model, the net effects of individual level variables on informal learning were assumed and examined as interaction effects of individual level and organizational level variables on informal learning.

Research Questions

This study examined the relationships between individual-level and organizational-level variables influencing nurses' informal learning. To achieve the research purposes of this study, the research questions accrued from the conceptual model, illustrated in Figure 1-2, were based on the review of the existing research. These are listed as follows:

1. What is the status of nurses' informal learning and what are individual and organizational factors influencing their informal learning?

    1.1. What is the status of informal learning among nurses?

    1.2. What individual nurse factors (task variety, task significance, friendship with other nurses, and learning motivation) influence their informal learning?

    1.3. What organizational factors (empowerment, leadership-committed learning environment, perception of team's support and openness of team's communication) influence their informal learning?

2. Does informal learning vary by individuals and across organizations?

3. How do individual factors affect informal learning?

4. How do organizational factors affect informal learning?

5. What are the effects of interactions between individual and organizational factors on informal learning?

Target Population and Research Sample

The population of this study includes all registered nurses residing and currently holding licenses to practice in a hospital in Korea. The number of licensed nurses in Korea is 323,041 and the number of current in-service nurses in Korea is 125,578 (Korean Healthcare Industry White Paper, 2014), which suggests that about 39% of the licensed nurses are working now. As it was impossible to collect all data from parent population of the registered nurses working in Korean hospitals who were objects of this study, this study used purposive sampling among non-probability sampling methods to draw samples. Probability sampling has statistical ruled on the proper size of sample depending on degree of reliability, but non-probability sampling has no special ruled other than larger samples were required for generalization (McMillan & Schmacher, 2006).

Considering the guidelines above, this study selected 5 hospitals among 281 general hospitals with more than 150 beds in Korea (Korean Healthcare Industry White Paper, 2014) and adopted a random selection to recruit 50 nurses on average per hospital.

Data Collection

This study used a self-administered internet-based online survey to obtain individual and organizational level perceptions by using an online commercial service provider (http://www.surveygizmo.com). The online survey method offers several advantages, offering

(1) accessibility to participants regardless of time and space (Birnbaum, 2004); (2) design flexibility (Dillman, Smyth, & Christian, 2008); (3) decreased possibility of missing data within questionnaires (Gall, Gall, & Borg, 2007); and (4) convenience of data coding and management. However, technological illiteracy and server access errors could negatively influence the online survey method.

Before launching the online survey, a preliminary meeting was held with nursing managers of each hospital to obtain an approval to administer the survey and to ensure that participants were able to understand and answer the questions. After posting the survey online, the nursing managers sent a hospital-wide email, asking all registered nurses in the selected hospitals to participate in the survey. Study participants from each hospital were not selected purposefully. The survey was active from May 25, 2016, to June 14, 2016. To increase the online survey response rate, reminder emails were sent through nursing managers to participants two weeks after the starting date. The procedure required three weeks to complete the data collection. The responses sent directly to the researcher through an online survey provider. After the data was collected through an online survey tool, participants' responses were transferred to a spreadsheet for analysis.

Measurement Instruments

In this study, online questionnaire was used to achieve this study purpose. The questionnaire was classified into informal learning, task variety, task significance, learning motivation, interpersonal relation, empowerment, learning-committed leadership, perception of team's support, openness of team's communication, and demographic characteristics. Demographic characteristics consisted of basic personal information, such as gender, age,

education, position, working department, and career years. The instruments to be used in this study were adapted to the Korean hospital situations through researcher's previous literature review and content validity verification of the existing measurement instruments, and pilot survey was performed after IRB approval and then modified and complemented before its use in the main survey.

Two preliminary tests, i.e. a field test and a pilot test, were conducted to establish the validity and reliability of the instrument developed for this study. In the field test, selected experts specializing in Informal Learning examined whether the instrument reflected nurses' situation and whether the question items were understandable, clear enough to answer, and relevant to the variables to be measured. To secure the reliability of findings, the process of selecting experts is considered highly important. To reflect the representativeness, appropriateness, professional knowledge and capabilities of the experts, 3 professors (2 of nursing and 1 of education) and 2 PhD students majoring in education, who were considered to specialize in informal learning, were selected (Table 3-1). The question items for the field test were corrected based on experts' comments before the final question items were completed.

In the pilot test, the reliability and validity of the questionnaire was verified by 40 nurses from 3 medium-sized hospitals with more than 150 beds located in Seoul from May 15 to 20, 2016. Data from 36 nurses were analyzed with 4 insincere respondents excluded. To verify the reliability of the instrument, the Cronbach alpha, a measure of internal consistency of question items, was analyzed. In the reliability analysis, the reliability level of each measure and the coefficient of the internal consistency of each question item were determined with the question items, whose elimination increased the overall reliability, being rectified.

Table 3-1.

Expert panels for verifying the content validity

	Affiliation	**Position**	**Major**	**Degree**
Expert A	K University	Professor	Nursing	PhD
Expert B	G University	Professor	Nursing	PhD
Expert C	S University	Professor	Education	PhD
Expert D	I University	Graduate student	Education	PhD course
Expert E	I University	Graduate student	Education	PhD course

Informal Learning Measuring Instruments

This study used the Korean version of the 'Informal Workplace Learning Outcomes' instrument developed by Kyndt, Govaerts, Verbeek, and Dochy in 2014 to measure the result of informal learning among nurses. This instrument classifies the result of informal learning into three categories: the generic learning outcomes (GLO), the job-specific learning outcomes (JSLO), and the organizational-level learning outcomes (OLLO) and consists of 19 items in total. This instrument was developed to target Socio-Educational Care Workers. The internal consistency (Cronbach alpha) coefficients are 0.88, 0.79, and 0.78, respectively for the three categories; thus, its reliability has been established. However, preliminary investigation was performed with nursing experts to identify whether there was a need to modify the contents to the hospital situations. In the process of translating the instrument, the terms 'client', as used in the organizational-level learning outcomes (OLLO), for example, were modified into patient,

patient's guardian, and physician in attendance considering the working environment

characteristics of nurses, who are objects of this study.

Individual-level Variables Measuring Instrument

      Task variety and task significance. This study used Hackman and Oldham (1975)'s

JDS (Job Diagnostic Survey) to measure task variety and task significance. This instrument

originally utilized 7-point Likert scale, but in the case of Korean language version, it was

modified to utilize a 5-point scale by Kim et al. (2012) to be consistent with other survey

instruments. In Kim et al.'s (2012) study conducted with more than 6,000 workers in various

types of business, the internal consistency coefficient (α) of the task variety was 0.753 and task

significance was 0.753.

      Interpersonal relation. For the purpose of this study, Moon's (2010) instrument was

revised to Korean business situations of the Workplace Friendship Scale (WFS) developed by

Nielsen et al. (2000) was used to measure interpersonal relation. This instrument contains 6 items

assessing friendship opportunity to form a relationship with colleagues at workplaces and 5 items

assessing friendship prevalence. In Moon (2010), the internal consistency coefficient (α) of the

instrument was 0.905.

      Learning motivation. To measure learning motivation, the instrument developed by

Button et al. (1996) was used in this study. This instrument measures two factors, performance

orientation and learning orientation. Each factor comprises 6 question items, and the internal

consistency coefficients (α) were 0.75 for performance orientation and 0.85 for learning

orientation. The measure was adapted to reflect Korean hospital situations based on the original

texts of the original instrument used by Button et al. (1996), and the preliminary investigation was done through nursing expert review before modification.

Organizational Level Variables Measuring Instrument

Empowerment. The revised instrument of Konczak, Steely, and Trusty's (2000) LEBQ (Leader Empowering Behavior Questionnaire) was used in this study to measure empowerment. Konczak et al. (2000) developed LEBQ to develop empowerment skills among supervisor's strategies and behaviors. This scale measures the awareness of supervisor and leaders' acts in the empowerment process and consists of 17 items, specifically, 3 items assessing delegation of authority, 3 items assessing accountability, 3 items assessing self-directed decision making, 2 items assessing information sharing, 3 items assessing skill development, and 3 items assessing coaching for innovative performance. In Konczak et al., the internal consistency coefficient (α) was 0.86, specifically, 0.92 for delegation of authority, 0.82 for accountability, 0.85 for self-directed decision making, 0.93 for information sharing, 0.86 for skill development, and 0.89 for coaching for innovative performance. Among these 6 factors, information sharing, skill development, and coaching for innovative performance had items similar to those measuring perception of team's support, learning-committed leadership, and openness of team's communication as team level variables. Thus, to prevent any confusion among respondents, three factors above were removed and the remaining three factors were included, resulting in nine items that were reconstructed.

Learning-committed leadership. This study used the learning-committed leadership instrument developed by Ellinger (2005) to measure learning promotion by seven subtypes of leadership. This instrument comprises 7 items, including items assessing provision of positive

feedback on the use of new knowledge and technology as well as items assessing supervisor's assistance with establishing goals so that employees can be involved actively in learning, giving an advice, and suggesting role model. Song (2011) examined a research of development personnel in Korean large companies using translated Ellinger's instrument. The internal consistency coefficient (α) was 0.898 and thus showed a high reliability.

Perception of team's support. Park's (2001) instrument measuring perception of team's support was used in this study. This instrument was modified to Korean situations of the measuring instrument on perceived organizational support originally developed by Eisenberger et al. (1986). This instrument consists of 10 items measuring the total awareness of team's support on a 5-point Likert scale. The higher score means a higher awareness of interest or support from team, and the internal consistency coefficient (α) of the original investigative instrument is 0.90.

Openness of team's communication. The instrument developed by Hyatt and Ruddy (1997) was adapted for the purpose of this study to measure openness of team's communication. This instrument is designed to identify the relationship between team characteristics and team performance and to measure the effectiveness of within-team communication using 6 items. The internal consistency coefficient (α) is 0.86. The primary investigator adapted the original measuring instrument to Korean hospital situations, and second adaptation was conducted through expert review. The pilot test is planned to be conducted.

Table 3-2.

Summary of measurement instruments for key variables

	Measure	Instrument	# of Items	English version Cronbach α	Korean version Cronbach α	Sources
Informal Learning	The generic learning outcomes(GLO), The job-specific learning outcomes(JSLO), The organisational-level learning outcomes (OLLO)	Informal Workplace Learning Outcomes	GLO – 10 JSLO – 5 OLLO - 4	0.88 0.79 0.78	N/A	Kyndt, Govaerts, Verbeek, & Dochy (2014)
Individual Level	Task variety	JDS (Job Diagnostic Survey)	3	0.71	0.753	Hackman & Oldham (1975), Kim et al. (2012)
	Task significance	JDS (Job Diagnostic Survey)	3	0.66	0.753	Hackman & Oldham (1975), Kim et al. (2012)
	Friendship with others	Workplace Friendship Scale(WFS)	11	0.82	0.905	Nielsen, Jex, & Adams (2000), Moon (2010)
	Learning motivation -Performance goal orientation(PGO) -Learning goal orientation(LGO)	Learning Motivation	PGO – 6 LGO - 6	0.75 0.85	N/A	Button, Mathieu, & Zajac (1996)

Table 3-2.

Summary of measurement instruments for key variables (continued)

	Measure	Instrument	# of Items	English version Cronbach α	Korean version Cronbach α	Sources
Organizational Level	Empowerment - Delegation of Authority - Accountability - Self-Directed Decision Making	Leader Empowering Behavior Questionnaire (LEBQ)	9	0.92 0.82 0.85	N/A	Konczak, Stelly, & Trusty (2000)
	Learning-committed leadership	Learning-Committed Leadership	7	N/A	0.898	Ellinger (2005), Song (2011)
	Perception of team's support	Perceived Organizational Support (POS)	8	0.90	0.90	Eisenberger et al. (1986), Park (2001)
	Openness of team's communication	Openness of Team's Communication	6	0.86	N/A	Hyatt & Ruddy (1997)
Demographic Variables	Age, Gender, Career experience, Education level, Certificate, Job specialization, Position		7	N/A	N/A	
	Total		**85**			

Translations of the Instruments

The final version of measures was translated, modified, and validated for a Korean target sample. The entire survey was translated from English to Korean and then translated back to English by 2 independent bilingual scholars of linguistics. This double translation practice was intended to ensure equivalency of meaning (Brislin, Lonner, & Thorndike, 1973). The aim of the translation processes was to maximize equivalence while minimizing translation errors. According to a guideline for the translation of measures in cross cultural research (Brislin, 1986), four translation procedures were used to translate the current instruments: (1) initial translation, (2) assessment of forward translation for clarity, common language, and cultural adequacy, (3) back translation, and (4) assessment of back translation for conceptual equivalence.

Initial translation. The researcher of this study and a bilingual doctoral student whose major focus is linguistics performed the initial translation of the measures from English to Korean. This step is considered the most critical to ensure the quality of the instruments because its outcome is highly dependent on and influenced by the translators (Weeks, Swerissen, & Belfrage, 2007).

Pre-test procedures. After the initial translation was completed, the instruments were tested in accordance with the recommendations made by Schuman (1966). A panel of four additional Korean professors field-tested the instruments in healthcare field, including nursing and medical education, and they cross-checked the translations against the original English version to find evident translation discrepancies. They were asked to note each item and its problems. This procedure was undertaken to allow the translators to provide feedback on the accuracy, clarity, accessibility, and cultural appropriateness of the translated study instruments

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for the target groups involved with the main study. Participants discussed questions pertaining to items of the instruments. Through these discussions, clearer and more accurate ways of expression or phrasing were identified. The participants decided on the best item formulation by offering their comments and suggestions.

Backward translation. Following the initial translation, back translations were conducted. They involved hiring a separate translator accredited at the professional level who was not previously exposed to these instruments. According to Brislin's recommendations (1986), the process is one of blind translation, whereby the translator is provided with the translated study instrument and asked to translate the material back to English. Comparisons were made to identify any differences between the English version and the Korean version.

Data Screening and Diagnostics

Scrutinizing the data and resolving issues prior to the main analyses may be particularly important for multiple regression analysis (Pedhazur, 1997). Many researchers emphasize the importance of regression diagnostics (Bollen, 1996; Johnson & Wichern, 2007). Based on their recommendations, the collected data was checked for accuracy, missing data, normality, linearity, outliers, and multicollinearity.

Data Analysis

Descriptive statistics (mean, standard deviation, frequency, and percentage) and validity assessment (confirmatory factor analysis) of the instruments were conducted using SAS 9.4 for Windows to identify the hierarchical relationship among nurse's informal learning, individual level variables, and organizational level variables, and hierarchical linear modeling was

conducted using HLM 7.0 for Windows. The variables that influence the informal learning have the properties of hierarchical data structure at two different levels, individual and organizational levels. In other words, organizational level variables, such as empowerment, learning-committed leadership, perception of team's support, and openness of team's communication, as well as individual level variables, may influence informal learning. This hierarchical linear model is appropriate for analyzing hierarchical structure of the units and measurement levels. This study conducted descriptive statistics to identify the relationships among nurse's informal learning level, individual level variable, and organizational level variable and to analyze Null Model, Mean Model, and Explanatory Model to determine the effects of individual and organizational level variables on informal learning.

First, Null Model divides the overall variation in informal learning as dependent variable into individual level variation and organizational level variation in the One-Way ANOVA with Random Effects Model, which is the minimum model for hierarchical linear model analysis, and uses within-group coefficient of correlation (ICC) to obtain basic information for the subsequent analysis.

For this null model, the slope (β_{1j}) from the regression model is set to zero, producing the following Level 1 model:

(Informal learning)$_{ij}$ = β_{0j} + r_{ij} where $r_{ij} \sim N(0, \sigma^2)$

With the slope set to zero, this Level 1 equation consists of the outcome variable at the lower level, Y_{ij}; the intercept, β_{0j}, representing the mean outcome; and the Level 1 error term, r_{ij} (Raudenbush & Bryk, 2002). For the Level 2 model, the intercept is set as an outcome variable:

$\beta_{0j} = \gamma_{00} + \mu_{oj}$ where $\mu_{ij} \sim N(0, \gamma_{00})$

This Level 2 equation includes the intercept, β_{0j}, as the outcome variable; the grand mean for Y_{ij}, γ_{00}; and the random effect, u_{0j} (Raudenbush & Bryk, 2002). Combining both the Level 1 and the Level 2 models results in the overall combined model:

(Informal learning)$_{ij} = \gamma_{00} + \mu_{oj} + r_{ij}$

This combined model produces the grand mean, γ_{00}; a Level 2 effect, u_{0j}; and a Level 1 effect, r_{ij} (Raudenbush & Bryk, 2002).

Next, Random-Coefficients Regression Model is set as the Mean Model with independent variables input into within-group model to calculate the predictable variation in individual level variable and organizational level variable. In this model, individual level variables, such as general characteristics, job characteristics, and socio-psychological characteristics, are entered first in the equation and the variables explaining the organizational level variation are not entered. Accordingly, intercept and gradient coefficients are considered as preferentially changing according to an organization, and the predictable variation in individual level variable is calculated through comparison with Null Model in variation estimates. In the next step, only organizational level variables, such as empowerment, learning-committed leadership, perception of team's support, and openness of team's communication, are entered. The variation estimates are then compared with those of the Null Model to calculate the predictable variation of organizational level variables.

Effects with job characteristics variables

Level 1 model:

$$(\text{Informal learning})_{ij} = \beta_{0j} + \beta_{1j}(\text{Gender})_{ij} + \beta_{2j}(\text{Age})_{ij} + \beta_{3j}(\text{Education})_{ij} +$$
$$\beta_{4j}(\text{Position})_{ij} + \beta_{5j}(\text{Years of working})_{ij} +$$
$$\beta_{6j}(\text{Task variety})_{ij} + \beta_{7j}(\text{Task significance})_{ij} + r_{ij}$$

Level 2 model:

$$\beta_{0j} = \gamma_{00} + \mu_{oj}$$
$$\beta_{1j} = \gamma_{10} + \mu_{1j}$$
$$\beta_{2j} = \gamma_{20} + \mu_{2j}$$
$$\beta_{3j} = \gamma_{30} + \mu_{3j}$$
$$\beta_{4j} = \gamma_{40} + \mu_{4j}$$
$$\beta_{5j} = \gamma_{50} + \mu_{5j}$$
$$\beta_{6j} = \gamma_{60} + \mu_{6j}$$
$$\beta_{7j} = \gamma_{70} + \mu_{7j}$$

Effects with socio-psychological characteristics variables

Level 1 model:

$$(\text{Informal learning})_{ij} = \beta_{0j} + \beta_{1j}(\text{Gender})_{ij} + \beta_{2j}(\text{Age})_{ij} + \beta_{3j}(\text{Education})_{ij} +$$
$$\beta_{4j}(\text{Position})_{ij} + \beta_{5j}(\text{Years of working})_{ij} +$$
$$\beta_{6j}(\text{Friendship with others})_{ij} +$$
$$\beta_{7j}(\text{Learning motivation})_{ij} + r_{ij}$$

Level 2 model:

$$\beta_{0j} = \gamma_{00} + \mu_{oj}$$
$$\beta_{1j} = \gamma_{10} + \mu_{1j}$$
$$\beta_{2j} = \gamma_{20} + \mu_{2j}$$
$$\beta_{3j} = \gamma_{30} + \mu_{3j}$$
$$\beta_{4j} = \gamma_{40} + \mu_{4j}$$
$$\beta_{5j} = \gamma_{50} + \mu_{5j}$$
$$\beta_{6j} = \gamma_{60} + \mu_{6j}$$
$$\beta_{7j} = \gamma_{70} + \mu_{7j}$$

Finally, in the final model, organizational level independent variables are entered into the Mean Model, Intercepts - and Slopes - as - Outcomes Model is set to calculate the net predictable variation of organizational level variables and analyze the interaction effects between individual level and team level variables.

Effects with organizational level variables

Level 1 model:

$$(\text{Informal learning})_{ij} = \beta_{0j} + \beta_{1j}(\text{Gender})_{ij} + \beta_{2j}(\text{Age})_{ij} + \beta_{3j}(\text{Education})_{ij} +$$
$$\beta_{4j}(\text{Position})_{ij} + \beta_{5j}(\text{Years of working})_{ij} +$$
$$\beta_{6j}(\text{Task variety})_{ij} + \beta_{7j}(\text{Task significance})_{ij} +$$
$$\beta_{8j}(\text{Friendship with others})_{ij} + \beta_{9j}(\text{Learning motivation})_{ij} +$$
$$r_{ij}$$

Level 2 model:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{Empowerment})_j + \gamma_{02}(\text{Leadership})_j + \gamma_{03}(\text{Perception of team's support})_j +$$
$$\gamma_{04}(\text{Openness of team's communication})_j + \mu_{oj}$$

Interaction effects with individual level and organizational variables on informal learning

Level 1 model:

$$(\text{Informal learning})_{ij} = \beta_{0j} + \beta_{aj}(X_{1j}) + r_{ij}$$

Level 2 model:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{Empowerment})_j + \gamma_{02}(\text{Leadership})_j + \gamma_{03}(\text{Perception of team's support})_j +$$
$$\gamma_{04}(\text{Openness of team's communication})_j + \mu_{oj}$$

CHAPTER 4: RESULTS AND FINDINGS

This chapter presents the results of the quantitative study. The main purpose of this study was to identify the hierarchical linear relationship among informal learning, individual level variables and organization-level variables of nurses in large hospitals. To that end, the following research questions were proposed:

Research Questions

1. What is the status of nurses' informal learning and what are individual and organizational factors influencing their informal learning?

    1.1. What is the status of informal learning among nurses?

    1.2. What are nurses' individual factors (task variety, task significance, friendship with other nurses, and learning motivation) influencing their informal learning?

    1.3. What are the organizational factors (empowerment, leadership-committed learning environment, perception of team's support and openness of team's communication) influencing their informal learning?

2. Does informal learning vary with individuals and across organizations?

3. How do individual factors affect informal learning?

4. How do organizational factors affect informal learning?

5. What are the effects of interactions between individual and organizational factors on informal learning?

This chapter includes three sections. The first section contains demographic characteristics and descriptive results of responses. The second section shows the results of

reliability and validity analysis of collected data. The last section utilizes various statistical methods to explore each of the five research questions.

Response Rate

To collect the data for this study, approximately 2,300 nurses working at 5 medium-to-large-sized Korean hospitals with more than 250 beds were invited to complete the online questionnaire survey. Overall, 233 nurses responded to the survey (valid response rate: 9.48%). To be specific, the response rate by each hospital was Hospital A 10.39%, Hospital B 9.98%, Hospital C 7.46%, Hospital D 6.87%, and Hospital E 12.71%. The data from 221 respondents with complete data was analyzed. The data from nurses with incomplete data, missing demographic information, and insincere responses was excluded.

In general, regression analysis requires testing the assumptions for regression equations (Kim, 2010). As the regression assumptions of multicollinearity, independency of residuals, and homoscedasticity are associated with variables and residuals, SAS 9.4 for Windows was used to verify the data. The results revealed no multicollinearity issues, with VIF being 3 or less, and supported the independence of residuals. Yet, the homoscedasticity indicated that independent variables, i.e., Task Variety, Task Significance, Perception of Team's Support, and Openness of Team's Communication, the residuals slightly showed a trend, it seemed hard to adopt the assumption of homoscedasticity. The data from three respondents that had a significant effect on the trend were excluded. After all, the responses from 218 nurses across 5 hospitals were used in the final analysis.

Demographic Information

Table 4-1 shows the general characteristics of the respondents used in the final analysis.

Females (97.7%) outnumbered males (2.3%), which is consistent with the ratio of women to men among the registered nurses in Korea. According to the statistics white paper issued by the KHIDI (2014), males account for about 2.3% (n=7,443) of the total registered nurses (n=323,701). In terms of age, 37.1% of the respondents were in their 20s, followed by 30s (28.1%), 40s (22.1%), and 50s (12.7%). Regarding education, 54.8% of the respondents were 4-year university graduates, followed by college graduates (37.6%), master's degree holders (6.8%), and PhD holders (0.9%). Concerning positions, 71.0% of the respondents were general-duty nurses (staff level), followed by head nurses (executive level, 15.4%) and supervisor nurses (manager level, 13.6%). In terms of wards, 43.4% of the respondents were assigned to general wards, followed by special wards (14.5%), intensive care units (ICU, 13.1%), outpatient departments (11.3%), administrative / medical insurance services (10.9%), and education/training departments (6.8%). Finally, 32.1% of the respondents had 2- to 4-year workplace experience, followed by 5- to 9-year experience (20.4%), less than 1 year (15.8%), 20 years and longer (15.4%), 10 to 14 years (9.0%), and 15 to 19 years (7.2%). Furthermore, 24.4% of the respondents had professional licenses or certificates, e.g., school health teachers, emergency medical technicians, nurses in medical insurance, and counseling psychotherapists.

Table 4-1.
Participant demographics (N=221)

Variables	Values	Frequency	Percentage
Organization (Hospital)	A Hospital	42	19.0%
	B Hospital	47	21.3%
	C Hospital	43	19.5%
	D Hospital	46	20.8%
	E Hospital	43	19.5%
Gender	Female	216	97.7%
	Male	5	2.3%
Age	Under 24 years old	20	9.0%
	25- 29 years old	62	28.1%
	30- 34 years old	30	13.6%
	35- 39 years old	32	14.5%
	40- 44 years old	29	13.1%
	45- 49 years old	20	9.0%
	Over 5o years old	28	12.7%
Education	Associate degree	83	37.6%
	Bachelor's degree	121	54.8%
	Master's degree	15	6.8%
	Doctorate degree	2	0.9%
Years of working	Less than 1 year	35	15.8%
	2 - 4 years	71	32.1%
	5 - 9 years	45	20.4%
	10 - 14 years	20	9.0%
	15 - 19 years	16	7.2%
	More than 20 years	34	15.4%
Specialization	General wards	96	43.4%
	Intensive care units (ICU)	29	13.1%
	Special wards (e.g. Emergency room, Operating room)	32	14.5%
	Outpatient departments	25	11.3%
	Administrative / medical insurance services	24	10.9%
	Others	15	6.8%
Position	General-duty nurses (Staff level)	157	71.0%
	Supervisor nurses (Manager level)	30	13.6%
	Head nurses (Executive level)	34	15.4%
Certificates	Yes	54	24.4%
	No	167	75.6%
	Total	221	100.0%

Table 4-2.
Participant demographics of each hospital (N=221)

Variables	Hospital A		Hospital B		Hospital C		Hospital D		Hospital E	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Gender										
Female	41	97.6%	47	100.0%	40	93.0%	46	100.0%	42	97.7%
Male	1	2.4%	0	0.0%	3	7.0%	0	0.0%	1	2.3%
Age										
Under 24 years old	4	9.5%	5	10.6%	7	16.3%	4	8.7%	0	0.0%
25- 29 years old	8	19.05%	18	38.3%	12	27.9%	19	41.3%	5	11.6%
30- 34 years old	6	14.3%	2	4.3%	7	16.3%	4	8.7%	11	25.6%
35- 39 years old	10	23.8%	5	10.6%	6	14.0%	8	17.4%	3	7.0%
40- 44 years old	5	11.9%	4	10.6%	9	20.9%	4	8.7%	6	14.0%
45- 49 years old	6	14.3%	5	10.6%	2	4.7%	4	8.7%	3	7.0%
Over 5o years old	3	7.1%	7	14.9%	0	0.0%	3	6.5%	15	34.9%
Education										
Associate degree	19	45.2%	11	23.4%	18	41.9%	9	19.6%	26	60.5%
Bachelor's degree	21	50.0%	27	57.4%	25	58.1%	33	71.7%	15	34.9%
Master's degree	2	4.8%	7	14.9%	0	0.0%	4	8.7%	2	4.7%
Doctorate degree	0	0.0%	2	4.3%	0	0.0%	0	0.0%	0	0.0%
Years of working										
Less than 1 year	9	21.4%	8	17.0%	11	25.6%	2	4.3%	5	11.6%
2 - 4 years	10	23.8%	10	21.3%	23	53.5%	16	34.8%	12	27.9%
5 - 9 years	4	9.5%	8	17.0%	4	9.3%	10	21.7%	19	44.2%
10 - 14 years	6	14.3%	3	6.4%	1	2.3%	5	10.9%	5	11.6%
15 - 19 years	4	9.5%	3	6.4%	3	7.0%	5	10.9%	1	2.3%
More than 20 years	9	21.4%	15	31.9%	1	2.3%	8	17.4%	1	2.3%
Specialization										
General wards	21	50.0%	24	51.1%	11	25.6%	12	26.1%	28	65.1%
Intensive care units	5	11.9%	8	17.0%	0	0.0%	10	21.7%	6	14.0%
Special wards	3	7.1%	5	10.6%	14	32.6%	10	21.7%	0	0.0%
Outpatient dept.	5	11.9%	2	4.3%	8	18.6%	10	21.7%	0	0.0%
Administrative dept.	4	9.5%	6	12.8%	8	18.6%	4	8.7%	2	4.7%
Others	4	9.5%	2	4.3%	2	4.7%	0	0.0%	7	16.3%
Position										
General-duty nurses	32	76.2%	32	68.1%	26	60.5%	35	76.1%	32	74.4%
Supervisor nurses	2	4.8%	10	21.3%	9	20.9%	4	8.7%	5	11.6%
Head nurses	8	19.0%	5	10.6%	8	18.6%	7	15.2%	6	14.0%
Certificates										
Yes	13	31.0%	15	31.9%	9	20.9%	6	13.0%	11	25.6%
No	29	69.0%	32	68.1%	34	79.1%	40	87.0%	32	74.4%
Total	42	100%	47	100%	43	100%	46	100%	43	100%

The characteristics of the respondents from each hospital are presented in Table 4-2. The average age of the respondents was 38.7 in Hospital E that was nearly 5 years older than the average age of the respondents in other hospitals. Also, the average work period of the respondents in Hospital A, Hospital B and Hospital D was 7 years, while it was 2.2 years in Hospital C. Most of the hospital respondents belong to various departments, but there was no respondent that belongs to special wards and outpatient departments in Hospital E. It is supposed that this study did not consider the characteristics of the departments when collecting samples.

For the participants' characteristics, chi-square tests were conducted to examine the difference in each hospital's participation rate. The significant differences by ages were not observed at the significance level of .05 (χ^2 = 3.472, p = .656).

Reliability and Validity Analyses

The instrument used in this study was proved valid and reliable in the literature. The instrument used in this study was selected based on the experts' review of the field test and the pilot test, where it was proved highly reliable. Additionally, the validity of the instrument was determined using the confirmatory factor analysis following the main survey. To validate the instrument used in the present study, the confirmatory factor analysis was conducted with SAS 9.4 for Windows. The maximum likelihood method was used to estimate the model, assuming that the measured variables followed the multivariate normal distribution. To determine the factor model fit, the fit indices in Table 4-3 were used. Cronbach alpha reliability statistics ranged from 0.89 to 0.96 at the five hospitals.

Table 4-3.

Fit indices and criteria for all constructs (N=218)

Indices	X^2/df	GFI	CFI	TLI	RMSEA
Criteria for fit	> 3	>0.90	<0.10	>0.90	>0.90

Note. Jŏreskog & Sŏborn (1996). LISREL 8 User's reference guide.

Informal Learning

The reliability of the Informal Workplace Learning Outcomes measure was verified in the pilot test as follows: the generic learning outcomes (0.727), the job-specific learning outcomes (0.807), and the organization-level learning outcomes (0.830). The reliability (α) of the Informal Workplace Learning Outcomes was acceptable in the main survey as follows: the generic learning outcomes (0.755), the job-specific learning outcomes (0.796), and the organization-level learning outcomes (0.715) (Table 4-4). The reported reliability of the original scale was $\alpha = 0.82$ (Kyndt et al., 2014).

Table 4-4.

Reliability of Informal Workplace Learning Outcomes measure (N=218)

	Cronbach α	
	Pilot test (n=36)	**Main survey (n=218)**
Informal Workplace Learning Outcomes	0.864	0.863
Generic learning outcomes	0.727	0.756
Job-specific learning outcomes	0.807	0.796
Organization-level learning outcomes	0.830	0.751

Table 4-5 shows the confirmatory factor model fit of the Informal Workplace Learning Outcomes measure. The model fit well in terms of RMSEA, whereas X^2, GFI, CFI and TLI indicated close fit, which suggested that the confirmatory factor analysis results were acceptable.

Table 4-5.

Confirmatory factor analysis model fit of Informal Workplace Learning Outcomes measure (N=218)

Model	X^2/df	GFI	CFI	TLI	RMSEA
Informal Workplace Learning Outcomes	2.970	.391	.362	.838	.075

Specifically, regarding the Informal Workplace Learning measure, the confirmatory factor analysis proved that all path coefficients between latent and measured variables were significant (p=.01, see Fig. 4-1).

Since all factor loadings were statistically verified, the construct validity of the measurement was substantiated. All items had standardized coefficients above the recommended cutoff point of 0.5(Kim, 2010), ranging from .507~.754 (Appendix 4). Additionally, the generic learning outcomes, the job-specific learning outcomes, and the organization-level learning outcomes correlated significantly with one another.
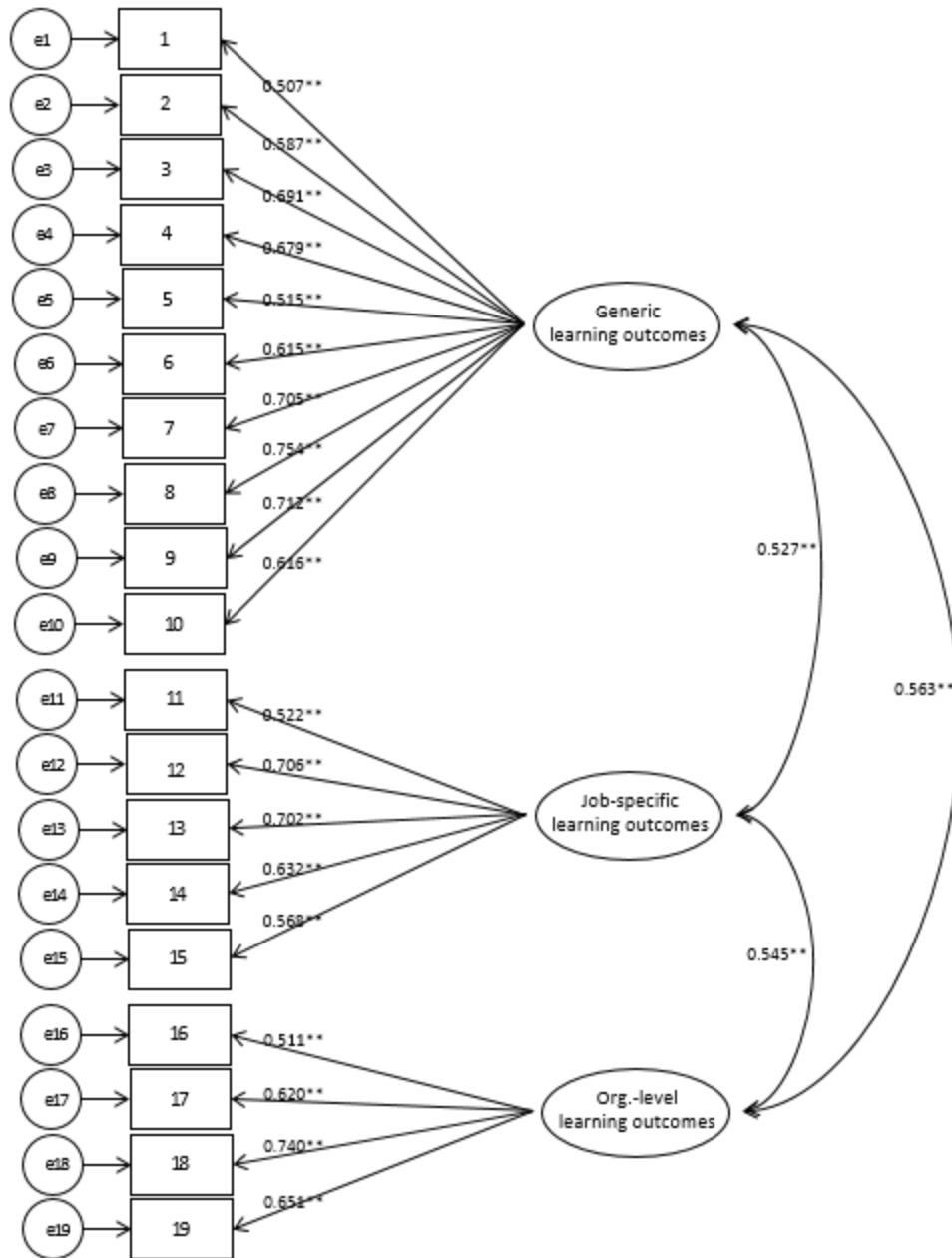
Figure 4-1. Confirmatory factor analysis results of Informal Workplace Learning Outcomes measure

Individual-level Variables

  Task Variety. The reliability (α) of the Task Variety was good (0.809). Compared to the

reported reliability of the original scale was $\alpha = 0.71$ (Hackman & Oldham, 1975). Table 4-6

shows the fit of the confirmatory factor model for the Task Variety measure. The model fit well in terms of all indices, except X^2, indicating the confirmatory factor analysis results were acceptable.

Table 4-6.

Confirmatory factor analysis model fit of Task Variety measure (N=218)

Model	X^2/df	GFI	CFI	TLI	RMSEA
Task Variety	1.446	.996	.998	.995	.036

Specifically, regarding the Task Variety measure, the confirmatory factor analysis indicated that all path coefficients between the latent and measured variables were significant (p=.01, see Fig. 4.2), supporting the construct validity of the measurement. The standardized coefficients of all items were greater compared to the recommended cutoff of 0.5 or greater, ranging from .529 to .809 (Appendix D).
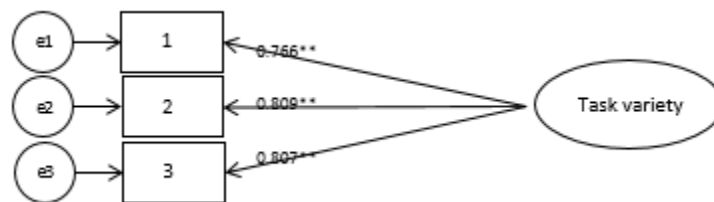
Figure 4-2. Confirmatory factor analysis results of Task Variety measure

Task Significance. The pilot test indicated that the reliability (α) of the Task Significance was relatively acceptable (0.705). The main survey indicated that the reliability (α)

of the Task Significance was good (0.818). The reported reliability of the original scale was α = 0.66 (Hackman & Oldham, 1975).

Additionally, Table 4-7 shows the confirmatory factor model fit of the Task Significance measure. Specifically, the model fit well in terms of all indices, excluding X^2, TLI, and RMSEA. Since RMSEA values increase with smaller values of variables or lower degrees of freedom, it is desirable to assess the model fit using also other indices (Hong, 2000). Thus, according to other indices, the confirmatory factor model was acceptable.

Table 4-7.

Confirmatory factor analysis model fit of Task Significance measure (N=218)

Model	X^2/df	GFI	CFI	TLI	RMSEA
Task Significance	33.697	.970	.964	.891	.212
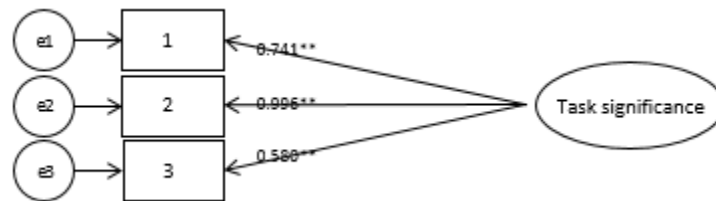
Figure 4-3. Confirmatory factor analysis results of Task Significance measure

Friendship with Other Nurses. Based on the pilot test of the reliability (α) of the Friendship with Other Nurses, the opportunity for and the scope of the Friendship with Other Nurses had relatively high reliabilities, or 0.802 and 0.852, respectively. Regarding the reliability (α) of the Friendship with Other Nurses verified in the main survey, the internal consistency coefficient (α), the opportunity for, and the scope of all items relevant to the Friendship with

Other Nurses were 0.886, 0.839, and 0.821, respectively. The reported reliability of the original

scale was α = 0.82 (Nielsen, Jex, & Adams, 2000).

Table 4-8 shows the confirmatory factor model fit of the Friendship with Other Nurses.

Specifically, the model fits well in terms of all indices, except RMSEA. As only the RMSEA

exceeded 0.1, the model for the Friendship with Other Nurses became unnecessarily complex but

explained the data well, which indicated that the confirmatory factor analysis results were

acceptable.

Table 4-8.

Confirmatory factor analysis model fit of Friendship with Other Nurses measure (N=218)

Model	X^2/df	GFI	CFI	TLI	RMSEA
Friendship with Other Nurses	4.659	.930	.942	.920	.102

Specifically, the confirmatory factor analysis of the Friendship with Other Nurses

indicated that all path coefficients between latent and measured variables were significant

(p=.01, see Fig. 4-4). As all factor loadings were statistically significant, the construct validity of

the measurement was substantiated. Moreover, the standardized coefficient of all items were

greater compared to the recommended value of 0.5, ranging from .564 to .907 (Appendix 4).

Moreover, the opportunity for and the scope of the Friendship with Other Nurses were

significantly correlated with each other.
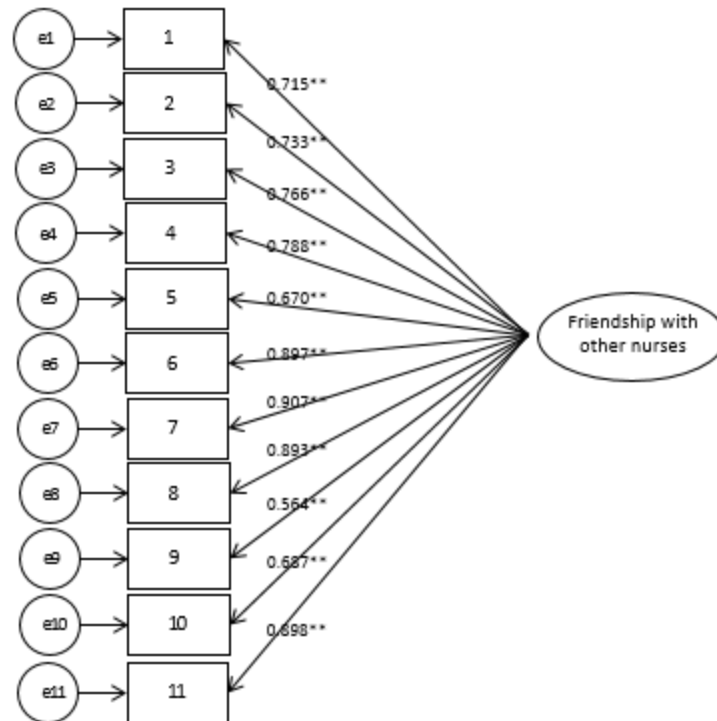
Figure 4-4. Confirmatory factor analysis results of Friendship with Other Nurses measure

Learning Motivation. The reliability (α) of the Learning Motivation was verified in the

pilot test. The reliability (α) of the pool of items relevant to the Learning Motivation was good

(0.808). Specifically, the motivations for performance and learning were good (0.803 and 0.818

each). The main survey indicated that the internal consistency coefficient (α) of the Learning

Motivation was 0.763, whilst the coefficients of the motivations for performance and learning

were 0.735 and 0.842, respectively. The reported reliability of the original scale was α = 0.75 and

0.85 (Button, Mathieu, & Zajac, 1996).

Table 4-9 shows the confirmatory factor model fit of the Learning Motivation. To be

specific, the model failed to fit in terms of all indices, but it had acceptable fit level of .800 or

greater.

Table 4-9.

Confirmatory factor analysis model fit of Learning Motivation measure (N=218)

Model	X^2/df	GFI	CFI	TLI	RMSEA
Learning Motivation	4.718	.891	.843	.804	.102

The confirmatory factor analysis of the Learning Motivation revealed that all path coefficients between latent and measured variables were significant (p=.01, see Fig. 4-5), supporting the construct validity of the measurement. The standardized coefficients of all items were greater compared to recommended 0.5 or greater, all items relevant to the Learning Motivation were within the recommended range of .529~.772, excluding No.3 (.448) and No.4 (.404) (Appendix D).
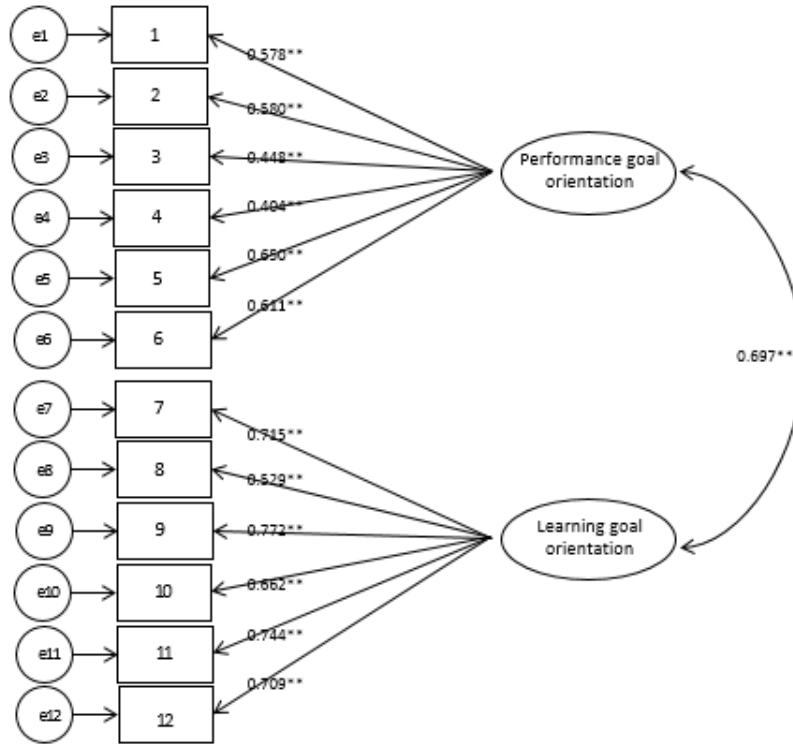
Figure 4-5. Confirmatory factor analysis results of Learning Motivation measure

Organization-level Variables

Empowerment. The reliability (α) of the empowerment was verified in the pilot test. The reliability (α) of all items relevant to the Empowerment was excellent (0.905) while those of Delegation of Authority, Accountability and Self-Directed Decision Making were excellent (0.906), acceptable (0.773), and good (0.886), respectively. The main survey indicated that the overall reliability of the Empowerment was good (0.884) while the reliabilities of Delegation of Authority, Accountability, and Self-Directed Decision Making were good (0.816), acceptable (0.780), and good (0.842), which suggested these measures were reliable. The reported reliability of the original scale was α = 0.92, 0.82, and 0.85 (Konczak, Stelly, & Trusty, 2000)

Table 4-10 shows the confirmatory factor model fit of the Empowerment. The model fit well in terms of all indices except X^2, indicating the confirmatory factor analysis results were acceptable.

Table 4-10.

Confirmatory factor analysis model fit of Empowerment measure (N=218)

Model	X^2/df	GFI	CFI	TLI	RMSEA
Empowerment	3.169	.955	.976	.951	.078
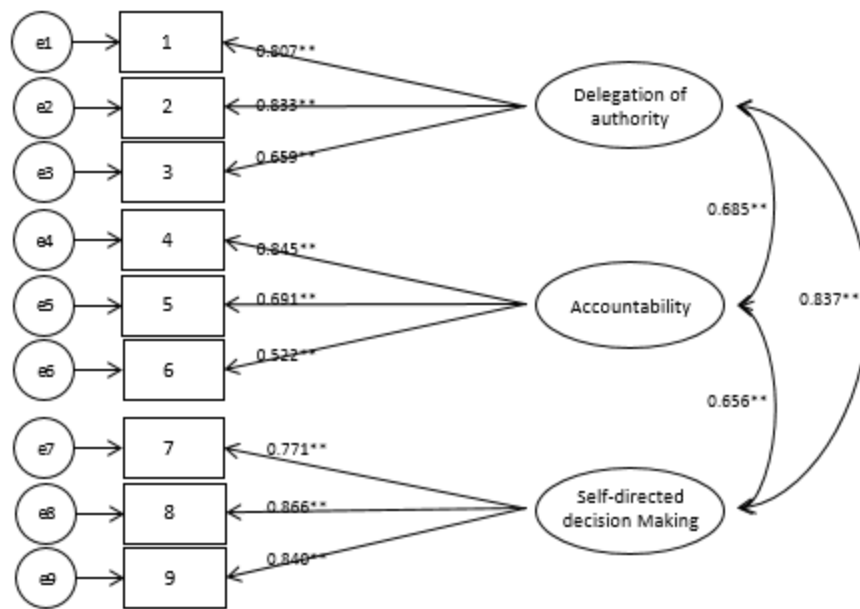
Figure 4-6. Confirmatory factor analysis results of Empowerment measure

Specifically, the confirmatory factor analysis of the Empowerment indicated that all path coefficients between latent and measured variables were significant (p=.01, see Fig. 4-6), supporting the construct validity of the measurement. All items had a standardized coefficient greater compared to a recommended cutoff of 0.5, ranging from .522 to .866 (Appendix 4). Likewise, the Delegation of Authority, Accountability, and Self-Directed Decision Making were significantly correlated.

Learning-Committed Leadership. The reliability (α) of the Learning-Committed Leadership verified in the pilot test was relatively good (0.898). The main survey indicated that the reliability (α) of the Learning-Committed Leadership measure was excellent (0.905). Table 4-11 shows the confirmatory factor model fit of the Learning-Committed Leadership. The model fit well in terms of all indices except X^2 and RMSEA, indicating the confirmatory factor analysis results were acceptable.

Table 4-11.

Confirmatory factor analysis model fit of Learning-Committed Leadership measure (N=218)

Model	X^2/df	GFI	CFI	TLI	RMSEA
Learning-Committed Leadership	8.675	.927	.941	.902	.147
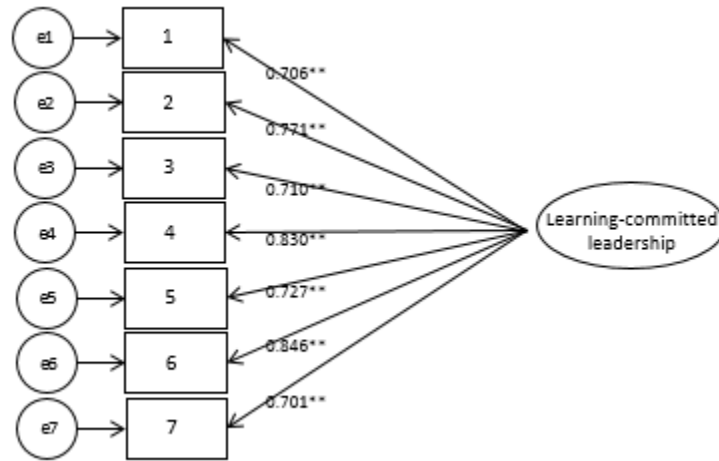
Figure 4-7. Confirmatory factor analysis results of Learning-Committed Leadership measure

Specifically, the confirmatory factor analysis of the Learning-Committed Leadership measure highlighted the significant path coefficients between latent and measured variables (p=.01, see Fig. 4-7). As all factor loadings were statistically significant, the construct validity of the measurement was substantiated. The standardized coefficients of all items were greater compared to the recommended value of 0.5, ranging from .706 and .846 (Appendix D).

Perception of Team's Support. The pilot test proved that the reliability (α) of the Perception of Team's Support was 0.859 while the main survey indicated that the reliability (α) of the measure was good (0.875). The reported reliability of the original scale was α = 0.90 (Eisenberger et al., 1986). Table 4-12 shows the confirmatory factor model fit of the Perception

of Team's Support measure. Specifically, the model did not fit in terms of X^2, TLI, and RMSEA, whereas it fit well in terms of GFI and CFI, which indicated the confirmatory factor analysis results were acceptable.

Table 4-12.

Confirmatory factor analysis model fit of Perception of Team's Support measure (N=218)

Model	X^2/df	GFI	CFI	TLI	RMSEA
Perception of team's support	5.339	.907	.901	.873	.111

The confirmatory factor analysis of the Perception of Team's Support highlighted that all path coefficients between latent and measured variables were significant (p=.01, see Fig. 4-8). As all factor loadings were statistically significant, the construct validity of the measurement was substantiated. The standardized coefficients of all items were greater compared to the recommended value of 0.5, ranging from .516 to .765 (Appendix D).
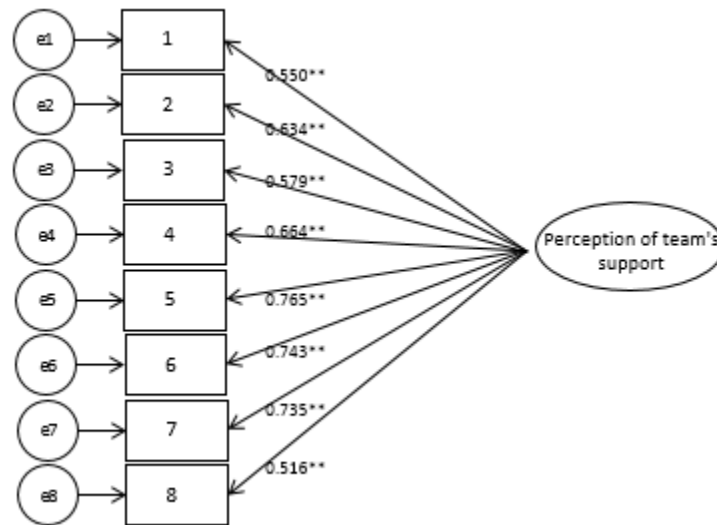
Figure 4-8. Confirmatory factor analysis results of Perception of Team's Support measure

Openness of Team's Communication. The pilot test showed that the reliability (α) of the Openness of Team's Communication was good (0.865). Similarly, the main survey indicated good reliability (0.864). The reported reliability of the original scale was α = 0.86 (Hyatt & Ruddy, 1997)

Table 4-13 shows the confirmatory factor model fit of the Openness of Team's Communication. Specifically, the model fit well in terms of all indices except X^2, which indicated that the confirmatory factor analysis results were acceptable.

Table 4-13.

Confirmatory factor analysis model fit of Openness of Team's Communication measure (N=218)

Model	X^2/df	GFI	CFI	TLI	RMSEA
Openness of Team's Communication	4.031	.967	.973	.955	.803

The confirmatory factor analysis of the Openness of Team's Communication measure showed that all path coefficients between latent and measured variables were significant (p=.01, see Fig. 4-9); thus, the construct validity of the measurement was substantiated. All items had standardized coefficients above the recommended 0.5 value, ranging from .685 to .833 (Appendix D).
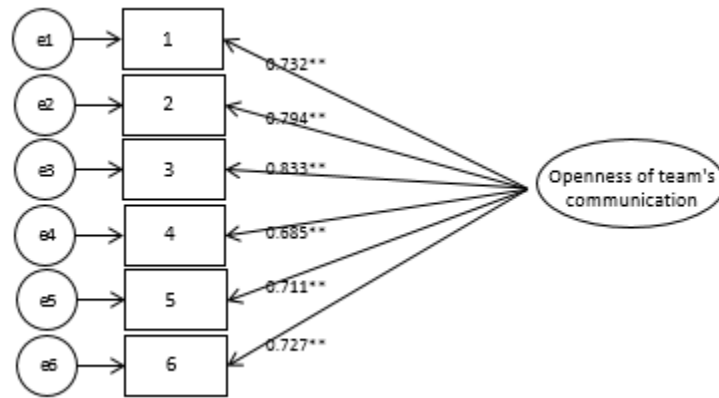
Figure 4-9. Confirmatory factor analysis results of Openness of Team's Communication measure

Statistics of Measured Variables

In this section, the first and the second research questions were focused on, and the first research question was answered by analyzing descriptive data from nurses and the second research question was tested by one-way ANOVA method.

Research Question 1: What is the status of nurses' informal learning and what are individual and organizational factors influencing their informal learning?

Informal learning. Table 4-14 shows the results for the nurses' Informal Workplace Learning Outcomes. Overall, nurses' informal learning averaged 3.60. The sub-factors of Informal Workplace Learning Outcomes, that is, the job-specific learning outcomes, the generic learning outcomes, and the organizational-level learning outcomes, had the mean scores of 3.76, 3.53, and 3.50, respectively. These mean scores were close to the positive response ('Yes (4.00)', indicating that informal learning among nurses through conversations, inquiries, trials and errors, and self-reflections is relatively active. Among the types of informal learning in nursing, the job-specific learning outcomes variable scored 3.76, which was higher compared to the other types

of informal learning. This finding seems to indicate that the high expertise required nurses to

engage in the core activity in hospitals, i.e., caring patients (Henderson et al., 2011).

Table 4-14.

Statistics of informal learning among nurses (N=218)

VARIABLES	MEAN	SD	MIN	MAX
Informal Workplace Learning Outcomes	3.60	.562	2.383	4.883
[GLO] Generic Learning Outcomes	3.53	.616	2.2	4.9
[JSLO] Job-Specific Learning Outcomes	3.76	.550	2.4	5.0
[OLLO] Organization-Level Learning Outcomes	3.50	.701	2.0	5.0

Individual-level variables. Table 4-15 shows the results for nurses' individual-level

variables. Individual-level variables involve nurses' demographics, job characteristics (Task

Variety and Task Significance), and socio-psychological characteristics (Friendship with Other

Nurses and Learning Motivation). In terms of job characteristics, Task Variety and Task

Significance had mean scores of 3.94 and 4.12, respectively. Task Significance had a higher

score compared Task Variety in job characteristics, which seems attributable to the relatively

specialized and systematic process in hospitals that is likely to hinder nurses from perceiving the

task variety of their workplace responsibilities.

In terms of socio-psychological characteristics, Friendship with Other Nurses and

Learning Motivation had mean scores of 3.75 and 3.78, respectively, which indicates that nurses'

Learning Motivation to improve performance is above the average and that they have many

opportunities to build broad interpersonal relationships with diverse members within their

nursing organizations.

Table 4-15.

Statistics of individual-level variables (N=218)

VARIABLES	MEAN	SD	MIN	MAX
Job characteristics				
Task Variety	3.94	.616	1.5	5.0
Task Significance	4.12	.664	2.333	5.0
Socio-psychological attributes				
Friendship with Other Nurses	3.75	.602	2.091	5.0
Learning Motivation	3.78	.521	2.75	5.0

In order to examine the effects of nursing experiences on Informal Workplace Learning

Outcomes among nurses, One-way ANOVA was conducted using 'position (staff level, manager

level, and executive level)' as a group variable. As a result, there were significant differences in

Informal Workplace Learning Outcomes among nurses' positions (F=16.159, p<0.05). This

finding indicates that nurses' experiences and their different duties according to their positions

influence individuals' informal learning outcomes. In a professional practice, such as nursing,

professionals should have the ability to facilitate knowledge creation and to share knowledge

(Jensen, 2007). Accordingly, it is important to consider that both personal experiences and work

activities can influence how individual's informal learning takes place.

Organization-level variables. Table 4-16 shows the statistics of nurses' organization-level variables, which involves Empowerment, Learning-Committed Leadership, Perception of Team's Support, and Openness of Team's Communication. Empowerment, Learning-Committed Leadership, Perception of Team's Support, and Openness of Team's Communication averaged 3.12, 3.09, 2.85 and 3.11, respectively, indicating that the perception of within-team empowerment, learning-committed leadership of team leaders, team's support, and open communication are 'average (3.00)' to below average.

Table 4-16.

Statistics of organization-level variables (N=218)

VARIABLES	MEAN	SD	MIN	MAX
Empowerment	3.12	.845	1.727	4.545
Learning-Committed Leadership	3.09	.875	1.429	5.0
Perception of Team's Support	2.85	.883	1.667	4.667
Openness of Team's Communication	3.11	.859	1.667	5.0

Research Question 2: Does informal learning vary with individuals and across organizations?

In order to examine the mean differences in Informal Workplace Learning Outcomes among nurses in five hospitals, One-way ANOVA was conducted. As a result, there were no significant differences in Informal Workplace Learning Outcomes among hospitals (0.052, $p<0.05$). The reason why there were no between-group differences is that this study targeted medium to large-sized hospitals with over 250 beds.

Table 4-17.

One-way ANOVA for Informal Workplace Learning Outcomes among hospitals (N=218)

Variables	Hospitals	MEAN	SD	*F* / Sig.	Post hoc
Informal Workplace Learning Outcomes	A	3.609	0.475		
	B	3.639	0.439		
	C	3.419	0.441	2.385	
	D	3.492	0.410	0.052	
	E	3.597	0.428		
[GLO] Generic Learning Outcomes	A	3.541	0.524		
	B	3.582	0.513		
	C	3.391	0.460	0.882	
	D	3.453	0.492	0.472	
	E	3.539	0.439		
[JSLO] Job-Specific Learning Outcomes	A	3.823	0.526		
	B	3.768	0.465		E > C
	C	3.548	0.527	2.539	(Tukey
	D	3.671	0.490	0.041*	HSD)
	E	3.851	0.503		0.302*
[OLLO] Organization-Level Learning Outcomes	A	3.511	0.549		
	B	3.622	0.481		
	C	3.334	0.623	2.110	
	D	3.366	0.585	0.081	
	E	3.424	0.644		

To be more specific, the significance level of Job-Specific Learning Outcomes was 0.041

and there were mean differences among the hospitals. Especially, there were the biggest

differences between Hospital E and Hospital C. However, the significance level of Generic

Learning Outcomes and Organization-Level Learning Outcomes was 0.472 and 0.081

respectively and there were no mean differences among the hospitals.

Individual and Organizational Variances in Informal Learning

In this section, the third to the fifth research questions were focused on and answered

using hierarchical linear modeling method.

Table 4-18 shows the null model (one-way ANOVA of random effects) of informal

learning among nurses. The HLM base model analysis was intended to partition the overall

variance of informal learning into individual and organizational variances, and it corresponded

with the minimal model that did not include individual and organization-level variables. First,

the fixed effect analysis showed nurses' informal learning averaged 3.596, which was

statistically significant (t=61.935, p<0.01).

Next, the analysis of random effects showed that the organizational and individual

variances were 0.029 and 0.208, respectively, which were used to estimate the within-group

coefficient of correlation (ICC). As a result, the organizational and individual differences

explained 15.4% and 84.6% of the entire variance in informal learning, respectively. This finding

indicates that Informal learning often occurs among individual nurses rather than at an

organizational level.

The χ^2 test was used to test the hypothesis that the informal learning is invariable among

workers across all kinds of organizations (χ^2=95.393, p<0.01). The null hypothesis was not

supported, demonstrating that nurses' informal learning varied across organizations. This finding

suggests that the organization-level variables explain the difference in informal learning. Thus,

both individual and organization-level variables had to account for the informal learning in the hierarchical analysis.

Table 4-18.

Base model analysis of informal learning (N=218)

Fixed effects	Coefficient	Standard error	*t*-ratio
Intercept, γ_{00}	3.596	0.058	61.953***

Random effect	Standard Deviation	Variance Component	χ^2
Between-group variance, τ_{00}	0.169	0.056	95.393**
Within-group variance, σ^2	0.555	0.307	
Within-group coefficient of correlation (ICC)	0.154		

*p<0.05, **p<0.01, ***p<0.001
Note: Within-group coefficient of correlation(ICC) = Between-group variance(τ_{00}) / (Between-group variance(τ_{00}) + Within-group variance(σ^2)) = 0.029 / (0.029 + 0.208) = 0.1223

Meanwhile, to accurately analyze the effects of organization-level variables, the effects of individual-level variables had to be controlled for while the between-group variance had to be partitioned. Since the effects of individual-level variables were not controlled in the base model, it was necessary to partition the between-group variance in the informal learning while controlling for the control variables, i.e., demographics, and individual-level variables, i.e., job characteristics (Task Variety and Task Significance) and socio-psychological characteristics (Friendship with Other Nurses and Learning Motivation). Therefore, when controlling for the individual-level variables, the between- and within-group variances in nurses' informal learning were 6.6% and 93.4%, respectively. The increased between-group variance in informal learning

appeared to be attributable to the decrease in the within-group variance in the informal learning, resulting from the application of the individual-level variables. Additionally, the between-group variance in the informal learning proved statistically significant (χ^2=69.247, p<0.001) (Table 4-19).

Table 4-19.

Variance in informal learning before and after controlling individual-level variables (N=218)

Random effects	Between-group variance, τ_{00}	Within-group variance, σ^2	χ^2
Before controlling individual-level variables	0.056 (15.4%)	0.307 (84.6%)	95.393**
After controlling individual-level variables	0.009 (6.6%)	0.128 (93.4%)	69.247***

*p<0.05, **p<0.01, ***p<0.001

The analysis of the individual- and organization-level variances in the informal learning showed that the organizational differences affected the informal learning. Still, the variance explained by the difference between hospitals was not greater than that ascribable to individual differences among nurses. In short, the informal learning varied by individual nurses rather than across organizations. Yet, the variance in informal learning attributable to organizational differences was up to 6.6%, which indicated that the informal learning varied across organizations. This finding suggests that both individual- and organization-level variables are worth establishing in light of their effects on the Informal learning.

Research Question 3: How do individual factors affect informal learning?

Effects of Individual-level Variables on Informal Learning

Effects of job characteristics. Table 4-20 shows the effects of job characteristics on informal learning. To establish the effects of job characteristics, we controlled for the demographic characteristics and applied the job characteristics, i.e., Task Variety and Task Significance, to the within-group model of the random-coefficients regression model.

According to the analysis of the fixed effects, Task Variety (t=3.384, p<0.001) and Task Significance (t=2.843, p<0.01) had statistically significant influence on the informal learning. That is, nurses' informal learning was proportional to their perceived diversity and importance of their tasks. Regarding the effects of Task Variety on informal learning, the regression coefficient of Task Variety was 0.217, meaning informal learning increased by 0.217 standard deviation (SD) when Task Variety increased by 1 SD. The regression coefficient of Task Significance was 0.169, meaning informal learning increased 0.169 SD when Task Variety increased by 1 SD.

The random-effects analysis indicated the between-group variance of 0.011, which was statistically significant (χ^2=110.016, p<0.05), indicating that informal learning varied across organizations depending on job characteristics. In addition, the analysis of the explanatory power of job characteristics showed that the within-group variance in informal learning decreased from 0.307 to 0.267 before and after applying the job characteristics variables, respectively (Table 4-20). The explanatory power of the job characteristics variables on nurses' informal learning was 13.03%.

Table 4-20.

Effects and explanatory power(R²) of job characteristics variables on informal learning (N=218)

Fixed effects	Coefficient	Standard error	*t*-ratio
Intercept, γ_{00}	3.596	0.058	61.953***
Task Variety	0.217	0.064	3.384***
Task Significance	0.169	0.059	2.843**

Random effect	Standard Deviation	Variance Component	χ^2
Between-group variance, τ_{00}	0.104	0.011	110.016*
Within-group variance, σ^2	0.517	0.267	

	Variance	R^2
Before applying job characteristics variables Within-group variance, σ^2	0.307	
After applying job characteristics variables Within-group variance, σ^2	0.267	13.03%

*p<0.05, **p<0.01, ***p<0.001

Effects of socio-psychological characteristics. Table 4-21 shows the effects of socio-psychological characteristics on informal learning. To establish the effects of socio-psychological characteristics, demographic characteristics were controlled before applying Friendship with Other Nurses and Learning Motivation to the within-group model of the random-coefficients regression model.

The fixed-effects analysis showed that Friendship with Other Nurses (t=4.396, p<0.001) and Learning Motivation (t=4.691, p<0.001) variables had statistically significant effects on

informal learning. That is, informal learning was proportional to one's positive perception of Friendship with Other Nurses and high Learning Motivation. Regarding the effects of socio-psychological characteristics on informal learning, the regression coefficient of Friendship with Other Nurses was 0.266, showing that informal learning increased by 0.266 SD per 1-SD increase in Friendship with Other Nurses. The regression coefficient of Learning Motivation was 0.326, meaning informal learning increased by 0.326 SD per 1-SD increase in Learning Motivation.

The random-effects analysis indicated the between-group variance of 0.011, which proved statistically significant (χ^2=23.614, p<0.05). Depending on individual-level variables, informal learning varied across organizations. Particularly, the within-group variance was 0.237, reflecting greater individual differences. Thus, in terms of the effects of socio-psychological variables on informal learning, individual differences outweighed organizational differences.

In addition, the analysis of the explanatory power on socio-psychological variables indicated that the within-group variance in Informal learning decreased from 0.307 to 0.237 before and after applying the socio-psychological characteristics, i.e. Friendship with Other Nurses and Learning Motivation variables, respectively (Table 4-16). The explanatory power of socio-psychological variables on nurses' informal learning was 22.8%.

This finding is consistent with the previous research that emphasized the importance of individual-level variables in informal learning (Argyris & Schön, 1981; Nonaka, 1994). That is, these findings suggest that the research process should not be oversimplified by partially focusing on some characteristics, including individual characteristics represented by the variables relevant to Informal Workplace Learning Outcomes when determining the individual-

level variables associated with the Informal Workplace Learning Outcomes. Additionally, in light of the explanatory power (R²) of individual-level variables relevant to Informal Workplace Learning Outcomes, the socio-psychological characteristics of nurses as the agents in Informal Workplace Learning Outcomes overrode the job characteristics variables. To be specific, Learning Motivation, Friendship with Other Nurses, Task Variety, and Task Significance were found to be important variables associated with Informal Workplace Learning Outcomes, in the order named.

Table 4-21.

Effects and explanatory power(R²) of socio-psychological variables on informal learning (N=218)

Fixed effects	Coefficient	Standard error	*t*-ratio
Intercept, γ_{00}	3.596	0.058	61.877***
Friendship with Other Nurses	0.266	0.060	4.396***
Learning Motivation	0.326	0.069	4.691***
Random effects	**Standard Deviation**	**Variance Component**	χ^2
Between-group variance, τ_{00}	0.107	0.011	123.614*
Within-group variance, σ^2	0.487	0.237	
		Variance	R^2
Before applying socio-psychological variables Within-group variance, σ^2		0.307	
After applying socio-psychological variables Within-group variance, σ^2		0.237	22.80%

*p<0.05, **p<0.01, ***p<0.001

Research Question 4: How do organizational factors affect informal learning?

Effects of Organization-level Variables on Informal Learning

Table 4-22 shows the effects of organization-level variables on informal learning. To establish the pure effects of organization-level variables, the individual-level variables were applied to the within-group model based on the intercepts and slopes-as outcomes model before applying the organization-level variables, i.e., Empowerment, Learning-Committed Leadership, Perception of Team's Support, and Openness of Team's Communication, to the between-group model.

The fixed-effects analysis showed that such organization-level variables as Empowerment, Perception of Team's Support, and Openness of Team's Communication had significant effects on nurses' Informal Workplace Learning Outcomes. Therefore, Learning-Committed Leadership exerted insignificant effects on nurses' informal learning. These findings indicated that informal learning varied with Empowerment, Perception of Team's Support, and Openness of Team's Communication when all other conditions were equal. That is, informal learning increased in organizations in which nurses perceived that positive supports were available and that within-team communication was open. In contrast, informal learning decreased as the Empowerment for nurses increased.

Regarding the effects of organization-level variables on informal learning, the regression coefficient of Empowerment was 0.012, meaning that informal learning increased by 0.012 SD per 1-SD increase in Empowerment. The regression coefficient of Perception of Team's Support was 0.127, suggesting that informal learning increased by 0.127 SD per 1-SD increase in Perception of Team's Support. The regression coefficient of Openness of Team's

Communication was 0.028, indicating that informal learning increased by 0.028 per 1-SD

increase in Openness of Team's Communication.

Table 4-22.

Effects and explanatory power(R^2) of organization-level variables on informal learning after individual-level variables were controlled (N=218)

Fixed effects	Coefficient	Standard error	*t*-ratio
Organization-level variables			
Intercept, γ_{00}	3.596	0.058	61.861***
Empowerment	-0.012	0.137	-0.086**
Learning-Committed Leadership	0.127	0.051	2.465
Perception of Team's Support	0.028	0.088	2.461**
Openness of Team's Communication	0.043	0.071	0.608**
Control variables			
Age	-0.015	0.006	-2.43*
Education	0.040	0.029	1.344
Career	0.014	0.007	2.080*
Position	0.008	0.024	0.337
Individual level variables			
Task Variety	0.149	0.060	2.461*
Task Significance	0.077	0.057	1.354
Friendship with Other Nurses	0.204	0.062	3.295***
Learning Motivation	0.287	0.069	4.140***

Random effect	Standard Deviation	Variance Component	χ^2
Between-group variance, τ_{00}	0.131	0.007	129.441**
Within-group variance, σ^2	0.476	0.227	

	Variance	R^2
Before applying organization-level variables Within-group variance, σ^2	0.011	
		36.36%
After applying organization-level variables Within-group variance, σ^2	0.007	

*p<0.05, **p<0.01, ***p<0.001

The random-effects analysis showed the between-group variance of 0.007, which was statistically significant (χ^2=129.441, p<0.1), indicating that nurses' informal learning varied across organizations. The analysed results of fixed-effects and random-effects were applied to the analysis of explanatory power (R^2) of organization-level variables. The between-group variance in informal learning decreased from 0.011 to 0.007 before and after applying the organization-level variables, respectively (Table 4-22). Thus, the explanatory power (R^2) of the organization-level variables on nurses' informal learning was 36.36%.

Research Question 5: What are the effects of interactions between individual and organizational factors on informal learning?

Interaction Effects of Individual- and Organization-level Variables on Informal Learning

The fifth objective of this study was to verify the interaction effects of individual- and organization-level effects on informal learning. To analyze the moderating effects of the organization-level variables, the interaction effects of the individual- and organization-level variables on informal learning were analyzed. Specifically, the interaction between organization-level variables with individual-level variables that were found to influence the Informal Workplace Learning Outcomes, i.e., Task Variety, Task Significance, Friendship with Other Nurses and Learning Motivation, was analyzed. The results revealed that this interaction is significant.

Table 4-23 shows the interaction effects of Task Variety and organization-level variables on informal learning. The fixed-effects analysis showed that Empowerment (t=1.388, p<0.01) had positive effects on the slope of Task Variety in relation to informal learning. The regression coefficient of the interaction between Task Variety and Empowerment was 0.507, meaning Task

Variety increased by 0.507 SD per 1-SD increase in Empowerment. The Perception of Team's Support (t=1.030, p<0.05) was found to have positive effects on the slope of Task Variety in relation to informal learning. The regression coefficient of the interaction between Task Variety and Perception of Team's Support was 0.253, meaning Task Variety increased by 0.253 SD per 1-SD increase in Perception of Team's Support. Thus, the effects of Task Variety on informal learning increased in proportion to the Empowerment and Perception of Team's Support.

Table 4-23.

Interaction effects of Task Variety and organization-level variables on informal learning (N=218)

Fixed effects	Coefficient	Standard error	*t*-ratio
Intercept, γ_{00}	3.596	0.063	56.751***
Task Variety * empowerment	0.507	0.365	1.388**
Task Variety * Learning-Committed Leadership	0.096	0.169	0.068
Task Variety * Perception of Team's Support	0.253	0.246	1.030*
Task Variety * Openness of Team's Communication	-0.437	0.386	-1.132

*p<0.05, **p<0.01, ***p<0.001

Table 4-24 shows the interaction effects of Task Significance and organization-level variables on informal learning. The fixed-effect analysis indicated that the Perception of Team's Support (t=1.095, p<0.05) had a positive effect on the slope of Task Variety in informal learning. The regression coefficient of the Task Significance and Perception of Team's Support was 0.249, meaning the Task Significance increased by 0.249 SD per 1-SD increase in the Perception of

Team's Support. Thus, the effects of Task Significance on informal learning increased in proportion to the Perception of Team's Support.

Table 4-24.

Interaction effects of Task Significance and organization-level variables on informal learning (N=218)

Fixed effects	Coefficient	Standard error	*t*-ratio
Intercept, γ_{00}	3.596	0.063	56.752***
Task Significance * empowerment	-0.127	0.341	-0.370
Task Significance * Learning-Committed Leadership	-0.022	0.149	-0.149
Task Significance * Perception of Team's Support	0.249	0.229	1.095*
Task Significance * Openness of Team's Communication	-0.041	0.330	-0.124

*p<0.05, **p<0.01, ***p<0.001

Table 4-25 shows the interaction effects of the Friendship with Other Nurses and organization-level variables on informal learning. The fixed-effects analysis found that the Openness of Team's Communication had a positive effect on the slope of the Friendship with Other Nurses in informal learning (t=1.434, p<0.01). The regression coefficient of the Friendship with Other Nurses and Openness of Team's Communication was 0.518, meaning the Friendship with Other Nurses increased by 0.518 SD per 1-SD increase in the Openness of Team's Communication. Therefore, the effects of Friendship with Other Nurses on informal learning increased in proportion to the Openness of Team's Communication.

Table 4-25.

Interaction effects of Friendship with Other Nurses and organization-level variables on informal learning (N=218)

Fixed effects	Coefficient	Standard error	t-ratio
Intercept, γ_{00}	3.595	0.063	56.750***
Friendship with Other Nurses* Empowerment	0.637	0.373	1.708
Friendship with Other Nurses* Learning-Committed Leadership	0.012	0.153	0.081
Friendship with Other Nurses* Perception of Team's Support	0.209	0.261	0.802
Friendship with Other Nurses* Openness of Team's Communication	0.518	0.361	1.434**

*p<0.05, **p<0.01, ***p<0.001

Table 4-26 shows the interaction effects of Learning Motivation and organization-level variables on informal learning. The fixed-effects analysis found that the Perception of Team's Support had a positive effect on the slope of Learning Motivation in informal learning (t=2.185, p<0.05). The regression coefficient of the Learning Motivation and Perception of Team's Support was 0.626, meaning the Learning Motivation increased by 0.626 SD per 1-SD increase in the Perception of Team's Support. Therefore, the effects of Learning Motivation on informal learning increased in proportion to the Perception of Team's Support.

Table 4-26.

Interaction effects of Learning Motivation and organization-level variables on informal learning (N=218)

Fixed effects	Coefficient	Standard error	t-ratio
Intercept, γ_{00}	3.599	0.063	56.750***
Learning Motivation * Empowerment	-0.159	0.435	-0.364
Learning Motivation * Learning-Committed Leadership	0.136	0.189	0.720
Learning Motivation * Perception of Team's Support	0.626	0.286	2.185*
Learning Motivation * Openness of Team's Communication	-0.339	0.431	-0.788

*p<0.05, **p<0.01, ***p<0.001

Significant implications were derived from the findings on the absence of the interaction effects. First, although the Openness of Team's Communication influenced the Informal Workplace Learning Outcomes, the interaction effects with individual-level variables were not found, except for the Friendship with Other Nurses. This finding supports the need to conduct the hierarchical linear model analysis to address the challenge arising from the conventional analysis methods that fail to consider the errors resulting from within- and between-group variances. Therefore, the hierarchical linear model analysis was used to differentiate individual-level variables from organizational-level. The results showed that the effects of individual-level variables surpassed those of the organizational-level variables.

Second, the analysis of the study model revealed that the Empowerment influenced the Informal Workplace Learning Outcomes but interacted only with the Task Variety to exert the interaction effects, meaning that the Empowerment did not influence the Friendship with Other

Nurses or Learning Motivation and that the organizational-level variables failed to control for the effects of individual-level variables on Informal Workplace Learning Outcomes. In other words, any organizational-level support for learning would not be effective if learners failed to establish personal values of learning.

CHAPTER 5: CONCLUSIONS

This chapter begins with a brief summary of the study and discusses the related findings. Next, the implications for HRD research and practice are addressed. Lastly, the limitations of this study are provided and recommendations and directions for future research are suggested.

Summary

It is a common assumption that nurses can learn about nursing tasks and procedures through formal education as well as through experiential practice. While ongoing discussions have concerned the appropriate formal educational requirement for nurses, much less is known about how they learn through experience, that is, through their repeated interactions with contexts. Benner (1984), a contemporary nursing education theorist, maintained that not enough attention has been directed to understanding the acquisition of expertise through informal learning. Marsick (1987) suggested that while formal learning is valuable if appropriately designed, emphasis should also be placed on helping individuals and groups learn effectively through their daily informal interactions. The dynamic informal learning process in hospitals as a workplace needs be explored to understand diverse aspects of workplace learning.

To empirically analyze the relationship of personal and organizational attributes with nurses' informal learning, the following questions are raised.

1. What is the status of nurses' informal learning and what are individual and organizational factors influencing their informal learning?

   1.1. What is the status of informal learning among nurses?

1.2. What are nurses' individual factors (task variety, task significance, friendship

with other nurses, and learning motivation) influencing their informal learning?

1.3. What are the organizational factors (empowerment, leadership-committed

learning environment, perception of team's support and openness of team's

communication) influencing their informal learning?

2. Does informal learning vary with individuals and across organizations?

3. How do individual factors affect informal learning?

4. How do organizational factors affect informal learning?

5. What are the effects of interactions between individual and organizational factors on

informal learning?

A hierarchical linear model that inputs the mean value of each hospital organization was applied to define the level of informal learning of each nurse working in the hospital and determine the level of influence of different organizational sizes or cultures on informal learning. Regarding the individual and organizational level variables, a questionnaire assessed Informal Workplace Learning Outcomes, individual level variables (Task Variety, Task Significance, Friendship with Other Nurses and Learning Motivation), and organizational level variables (Empowerment, Leadership, Perception of Team's Support, and Openness of Team's Communication). The existing instruments were applied or adapted to achieve the research objective. Finally, reliability of instruments was determined by Cronbach's alpha (0.89 ~ 0.96 at the five hospitals) and validity was determined by confirmatory factor analysis in the pilot test and the main survey.

To collect the data for this study, approximately 2,300 nurses working at 5 medium-to-large-sized Korean hospitals with more than 250 beds were invited to complete the online

questionnaire survey. Overall, 233 nurses responded to the survey (valid response rate: 9.48%). Insincere, incomplete, or overlapping responses were excluded, yielding 218 complete responses. These data were analyzed using descriptive statistics, null model (One-Way ANOVA with Random Effects), mean model (Random-Coefficients Regression Model), and explanatory model (Intercepts-and Slopes-as-Outcomes Model) of hierarchical linear model (HLM). All data analysis was accomplished using SAS 9.4 and HLM 6.0 program.

The result of this research can be summarized as follows. The informal workplace leaning level of nurses in large hospitals was 3.60. Individual level variance accounted for 84.6% of total variance and organizational level variance accounted for 15.4% of total variance in informal learning. Task characteristics accounted for 13.03% while social and psychological characteristics accounted for 22.8% of the within group variance. The effect of task variety (β=0.217), task significance (β=0.169), workplace friendship (β=0.266), and learning motivation (β=0.326) on informal learning were significant. Organizational variables accounted for 36.36% of the between group variance. The effect of empowerment, perception of team's support, and openness of team's communication about informal learning were significant. Interaction effects of task variety and empowerment (t=1.388, p<0.01), task variety and perception of team's support (t=1.030, p<0.05), task significance and perception of team's support (t=1.095, p<0.05), workplace friendship and openness of team's communication (t=1.434, p<0.01), and learning motivation and perception of team's support (t=2.185, p<0.05) on informal learning were significant.

Discussion of Results

The present study was intended to survey Korean nurses to establish the hierarchical relationship between their informal learning and individual- and organization-level variables. Below are the conclusions drawn from the present findings.

First, the informal learning among the nurses was good. Regarding the factors of informal learning, the job-specific learning outcomes, the generic learning outcomes, and the organizational-level learning outcomes were high, in the order named. This finding seems to be attributable to the nurses' job characteristics indicating that the high expertise required nurses to engage in the core activity in hospitals, i.e., caring patients (Henderson et al., 2011). Clinical nurses are supposed to cooperate with other professionals in hospital organizations, e.g., doctors, medical technicians, and administrative staff, to provide patients with care services (KNA, 2014; Lee et al., 2014). Furthermore, nursing jobs directly associated with patients' health and lives are likely to disintegrate due to the advancements in healthcare technology, which calls for continuous learning (Abuzzese, 1992; Murphy, 2008; Noh et al., 2008). In the same vein, nurses learn an increasing proportion of specific knowledge and hands-on skills required for their practice in hospitals from colleagues or supervisors in addition to the regular hospital-based formal training programs on practical knowledge and skills. That is, an increasing number of nurses engage in job-specific learning via human networks or cooperation with colleagues. Organizations in hospitals are fitted with relatively fine educational infrastructure involving systematic and diverse approaches to formal learning. Yet, for the formal learning to be transferred to the field, it is necessary to build proper networks of relations, e.g., the friendship with other nurses.

Second, individual-level variables rather than organizational-level variables influenced the informal learning among nurses. Although the organizational-level variables partially influenced informal learning, the finding suggests that the explanatory power of organizational difference was not as great as the explanatory power of individual difference. Yet, this finding does not necessarily mean that the organizational-level variables are insignificant. It should be noted that this study sheds light on the potential to improve the informal learning among nurses in terms of organizational-level variables. Workplace learning was reported to arise from the interaction between learners' learning process and environmental factors that influence their learning. As learning is affected by the characteristics specific to an organization, the organizational characteristics serve as factors that either facilitate or hamper learning (Illeris, 2004). The organizational-level variables relevant to informal learning include risk taking (Abbey, 1999; Chiva-Gomez. 2004; Skule, 2004), vision sharing (Abbey, 1999; Moon, 2005), contact with external environment (Abbey, 1999; Skule, 2004), open communication (Abbey, 1999; Chiva-Gomez. 2004; Moon, 2006; Shin et al., 1999), horizontal hierarchy, diversity, knowledge transfer, collaboration (Chiva-Gomez. 2004), and openness to demands (Skule, 2004). These findings suggest that organizational-level variables play pivotal roles in facilitating the informal learning; therefore, organizations should develop a range of measures to improve the informal learning among their members.

Third, socio-psychological characteristics, as part of individual-level variables, exerted greater effects on the informal learning compared to job characteristics. That is, socio-psychological characteristics, e.g., Learning Motivation and Friendship with Other Nurses, and job characteristics, e.g., Task Variety and Task Significance, influenced the informal learning, in the order named. This finding seems to be associated with the characteristics of nurses' informal

learning. Unlike in business organizations, clinical nurses' jobs involve mostly observations and informal practices (Garrick, 1998; Jeong, 2000). Specifically, nurses' learning relies heavily on informal learning approaches, e.g., observations or practices, where nurses' intrinsic Learning Motivation and human networks, including the Friendship with Other Nurses have significant effects on informal learning.

Fourth, the organizational-level variables relevant to the informal learning among the nurses, i.e., Empowerment, Perception of Team's Support, and Openness of Team's Communication, had statistically significant effects on their informal learning, whereas the Learning-Committed Leadership did not exert significant effects. These findings indicate that organizational members' perceptions of organizational care and attention and of the open communication enhance the informal learning. The insignificant influence of the Learning-Committed Leadership in this study is opposite to the finding of the previous researches (Enos et al., 2003; Skule, 2004). Previous studies reported that organization culture for encouraging learning highly influences the arising of learning, since informal learning generates unconsciously and unintentionally and especially, for generating learning in an organization, an organization needs a leader who shows devoted leadership, not giving direction under hierarchical order (Chiva-Gomez, 2004; Zucchi & Edwards, 2000). To understand one of the reasons why this study result doesn't correspond to the previous study results, there is a need to consider that this study targeted nurses working in large hospitals. In professional jobs like nursing, learning is like an obligation to maintain up-to-date professional expertise (Jensen, 2007). Informal learning might generate spontaneously. Therefore, when a team leader aims for learning itself, it can lead to negative leadership to force employees to learn. The mean score of the Learning-Committed Leadership perceived by the nurses was 3.09 that corresponds to an

average level. This shows that the level of the Learning-Committed Leadership perceived by the nurses was not high. For generating learning when team members don't recognize it as intentional learning, it is required to have a new understanding of a team leader's leadership to create team's culture.

Since the effects of Perception of Team's Support or Openness of Team's Communication on informal learning are more significant compared to those of team leaders' Learning-Committed Leadership, a team's culture or ethos is a more important variable compared to a team leader's personal influence. Hospitals differ from other business organizations in terms of organizational culture. Regarding nursing organizational culture in Korean hospitals, Lee (1998) reported that nursing organizations were characterized by conservative and hierarchical culture (Han, 2001; Kim, 2006; Lee, Han, & Kim, 2008). Additionally, Kwon (2000) reported that nursing organizations are characterized by human-oriented friendly but conservative culture. Therefore, institutional support for open communication or organizational awareness of systematic support overrides supervisors' personal influence within an organization.

Fifth, individual-level variables relevant to nurses' informal learning were found to interact with organizational-level variables. To be specific, significantly positive interaction effects on informal learning were found between Task Variety and Empowerment; Task Variety and Perception of Team's Support; Task Significance and Perception of Team's Support; Friendship with Other Nurses and Openness of Team's Communication; and Learning Motivation and Perception of Team's Support. Notably, the interaction between Openness of Team's Communication and individual-level variables had positive effects on informal learning, suggesting that the Openness of Team's Communication is important in nurses' informal

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learning. As the informal learning takes place as a part of daily routines around the workplace, the interactions between learners and external parties are highly relevant (Manceil, 2001). Such interactions facilitate the informal learning (Ellinger, 2005; Eraut, 2004; Skule, 2004). These findings underscore the diversified attempts to change the culture surrounding the organizational communication in many hospitals. Meanwhile, the absence of interaction effects between some variables implies that the organizational-level variables fail to control for the effects of individual-level variables on learning.

Implications

Theoretical Implications

The present study shed light on the variables influencing the informal learning among nurses and the relationships between such variables based on the empirical data. In particular, hospitals are classified as public goods associated with the quality of human life and education that are indispensable for the society, and they have existed as long as business organizations in human history. Yet, the research has so far neglected to see the archetype of workplaces other than manufacturers and large enterprises. Despite the need to delve into the informal learning in the context of diverse workplaces (industries, corporate sizes, teams, individual culture, ethos, and goals) in various types of companies, most theses have focused on the informal learning in large enterprises and manufacturers (Ahn, 2006; Enos, 2001; Moran, 2003; Wagner, 2000; Walker, 2001; Weintraub, 1998). Hence, the present study focused on nurses in hospital organizations to establish the effects of organizational variables on their informal learning. The present findings support previous reports on informal learning, which indicated that a range of workplace contexts (industries, corporate sizes, teams, individual culture, ethos, and goals)

influenced the informal learning (Bassi & Van Buren, 1999; Boud & Middleton, 2003; Crossan & White, 1999; Dobbs, 2000; Ellinger, 2005; Eraut, 2004; Garrick, 1998; Grolnic, 2001; Masick & Volpe, 1999; Moran, 2003; Svensson, Ellstrom, & Aberg, 2004; Yang & Lu, 2001).

Second, the present study statistically analyzed job characteristics variables, socio-psychological variables, and organizational-level variables in relation to the informal learning. Previous studies reviewed literature on informal learning or analyzed the qualitative data (Ahn, 2005, 2006; Boud & Middleton, 2003; Ellinger, 2005; Eraut, 2004; Grolnic, 2001; Lee, 2008, 2009; Lee, 2010; Moran, 2003; Svensson, Ellstrom, & Aberg, 2004) or measured individual variables, such as learning motivation (Moon, 2006; Li, 2001), friendship (Christina, 2001; Li, 2001; Stewart, 1996), self-esteem (Park & Kim, 2012), and social network (Drlik & Beranek, 2016). Still, the scope of research on informal learning need to be expanded to apply the findings to diverse organizational and individual contexts while at the same time, some quantitative approaches need be adopted to provide some reference data for further comparison. In terms of methodology, when individual- and organization-level variables undergo the traditional single-layered analyses, e.g., the analysis of variance or multiple regression analysis, the effects of organizational variables are often blocked or confounded when establishing the effects of individual- and organization-level variables on informal learning (Bliese, 2000). The single-layered method is limited in that it fails to consider the errors resulting from the group variance (Kang, 2003; Ryu, 2006). In the present study, the between-group difference explained 15.4% of the variance in the base model, indicating the between-group difference was statistically significant (χ^2=95.393, p<0.001), whereas when controlling for the individual-level variables, the organizational difference explained 6.6% of the variance in Informal learning. This finding supports previous reports that learning occurred from the interaction between organizational and

individual characteristics (Jeong, 2005; Park & Lee, 2012). Although the variance attributable to organizational difference decreased when controlling for the individual-level variables, organizational difference was still present. In this aspect, the hierarchical linear model analysis is a meaningful method in that it applies organizational mean values to identify the individual- and objective organizational-level effects to facilitate inter-organizational comparison.

Third, the present study accumulated empirical data on what the nurses acquired through the informal learning. Previous studies on informal learning mostly failed to measure the informal learning and relevant outcomes. Instead, they measured the applicability of the methods of informal learning and resultant organizational outcomes. The assessment studies on informal learning have analyzed organizational members' job capability, job satisfaction, job skills or relationship between the foregoing components with competencies and posited that informal learning affects organizational outcomes (Alonderienė, 2010; Rowold & Kauffeld, 2009). Still, those studies focused on the ways in which knowledge or skills are acquired through informal learning rather than on the content of learning while measuring the informal learning. That is, instead of evaluating the specific aspects constituting the informal learning, the previous studies assessed whether such methods as On the Job Training (OJT) and Community of Practice (CoP) are properly applied. By contrast, the present study defined the generic learning outcomes, job-specific learning outcomes, and organizational-level learning outcomes, as assessed using the 'Questionnaire on Informal Learning Outcomes' developed by Kyndt et al. (2014), as the outcomes of informal learning, and it measured the specific outcomes. The present approach will be conducive to researchers seeking some measurement instruments suitable for their objectives based on diverse definitions of informal learning.

Practical Implications

The present findings help HRD researchers understand the workplace learning of healthcare professionals and lay the practical foundation for policymakers and professional educators to build learning systems for continuous workplace learning for healthcare professionals.

First, since the informal learning outcomes varied with the opportunities for and scope of friendship with other nurses, positive organizational measures need be established to facilitate the friendship with other nurses.

Conservative and hierarchical culture represents nursing organizations in Korea (Han, 2001; Kim, 2006; Lee, Han, & Kim, 2008). Such an organizational culture is unlikely to encourage the active organizational communication, empowerment, and friendship with other nurses. Many organizations adopt various policies, including mentoring programs, to help their members adapt. Still, quite a few mentoring programs are formal and focus on new employees' adaptation to organizations rather than the implementation of learning or job performance. As an effective way of helping new nurses socialize, the preceptorship has been widely used in nursing education (Bain, 1996). As experienced colleagues and role models, preceptors teach nursing practices to new nurses within the nursing units; facilitate their adaptation to organizations; help them acquire new roles and successfully socialize within a limited period; and teach, counsel, and encourage their further growth and development (Choi & Nam, 2012; Clayton et al., 1989). Thus, supporting preceptors as the mentors for new nurses or junior nurses can have positive effects on workplace learning and help nurses maintain the friendship with other nurses even after the preceptorship period.

Second, organizations should diversify tasks to expand the informal learning opportunity. In this study, Task Variety, as a part of job characteristics, exerted significant effects on Informal Workplace Learning Outcomes, which supported the previous findings (Billett, 2001; Engerström, 1999; Kwakman, 2003; McCauley et al., 1994; van Woerkom et al., 2002). This finding mirrors the characteristics specific to hospital organizations where service production is subject to complex transitions exemplified by the core activities related to patient care, which is implemented by an organic cooperation among multiple professionals and assistant staff in hospitals (Henderson et al., 2011). For instance, in small and medium businesses, workers usually engage in repetitive tasks as a part of daily routines, and infrequently, they encounter exceptional cases. Such repetitive routine works lead to fewer opportunities for acquiring new skills or knowledge (Gersick & Hackman, 1990), lessening the likelihood of Informal Workplace Learning Outcomes. By contrast, nurses in medium sized or large hospitals perceive the encounter with unexpected situations as Task Variety, as they are required to cope with rapidly changing care settings, despite the predetermined systematic duties. One's willingness to deal with such situations and learn is likely to lead to the informal learning. Therefore, it is necessary to encourage organizations or teams to diversify their work processes to ensure the variety of tasks for organizational members. Workshops aimed at improving work processes within teams will help develop new processes and share the processes with other colleagues. In addition, in the course of seeking a method of carrying out tasks, one is likely to feel motivated to learn and spontaneously engage in informal learning.

Third, the results of this study appeared to suggest the importance of learning motivation as an important factor influencing informal learning (Sambrook & Stewart, 2000; Schunk, 1991; Zimmerman & Martinez-Pons, 1990). Unlike the formal learning, informal learning is

characterized by not being compulsory, which is why it necessarily relies on one's motivation to learn. Previous studies stressed learning-related cognitive variables, including intelligence and achievement. However, since Learning Motivation enables one to select activities and make persistent efforts even in the face of adversities, it is a prerequisite for professional workers who are supposed to create new knowledge and value through constant learning and acquisition of knowledge in a fast-paced society (Kim, 2004). In particular, as the informal learning takes place in a workplace in an unintended but self-directed way, the present finding supports the importance of the learning motivation in informal learning.

Learning motivation involves not only individual willingness, or intrinsic motivation, but also extrinsic motivation associated with the consequences of learning, including self-development, employment, new job opportunities, improved job performance, and certification (Sargant, 2001). Occasionally, people embark on learning for extrinsic rewards and gradually internalize the learning process, which leads to natural learning even in the absence of any extrinsic rewards. Thus, it is suggested that organizations should facilitate the informal learning by developing some measures to boost the extrinsic learning motivation of team members and creating an organizational culture for learning.

Research Limitations

The present study was intended to propose and identify a range of individual-level variables (Task Variety, Task Significance, Friendship with Other Nurses and Learning Motivation) and organizational level variables (Empowerment, Leadership, Perception of Team's Support, and Openness of Team's Communication) influencing the Informal Workplace Learning Outcomes. Still, there is no consensus among scholars on the definition of informal

learning. The selection of potential variables affecting the informal learning may vary with the definition of the concept, which warrants further studies on other socio-psychological variables (self-esteem and social networks) and organizational variables [risk taking (Abbey, 1999; Chiva-Gomez. 2004; Skule, 2004), vision sharing (Abbey, 1999; Moon, 2005), contact with external environment (Abbey, 1999; Skule, 2004), open communication (Abbey, 1999; Chiva-Gomez, 2004; Moon, 2006; Shin et al., 1999), horizontal hierarchy, diversity, knowledge transfer, and mutual cooperation (Chiva-Gomez, 2004)] that were not included in this study.

Second, the present study analyzed the data from 218 nurses across five organizations using the hierarchical linear model (HLM) on the grounds that HLM could explain each individual's dependent variables in terms of individual-level characteristics, organizational-level characteristics, and interactions between the two, and it could consider individual outcomes from the perspective of not just individual characteristics, but also contextual effects surrounding the individuals (Raudenbush & Bryk, 2002). To effectively utilize multilevel models, one must have an adequate number of clusters (McNeish & Stapleton, 2016). The five organizations selected for this study are far from a sufficient sample for the HLM. Thus, the reliability of the study should be enhanced by using the data collected from more diverse organizational samples.

Third, the data for the current study came from self-reported surveys assessing employees' experiences, knowledge, and perceptions. Thus, common method bias cannot be ruled out (Podsakoff & MacKenzie, 1994; Podsakoff et al., 2003). To minimize the risk of common method bias in this study, the dependent variable of informal learning outcomes should be obtained via objective measures. The separation of sources enables researchers to draw conclusions from objectively verified findings, reducing the risk of bias in research findings.

Finally, this study may not be fully generalizable to other industrial settings outside of healthcare services. Thus, it is necessary to investigate different industries, e.g., services, IT corporations, and small and medium-sized hospitals, as well as different organizational settings with different cultural backgrounds, including western cultures, to increase the understanding of the relevant issues across the board.

Recommendations for Future Research

First, future studies need to develop an instrument to measure both the process and the outcomes of the informal learning. The present study measured the individual nurses' perception of informal learning outcomes. It has been argued whether learning should be viewed as a process, frequency, or outcome. Yet, informal learning occurs informally, spontaneously, and even unknowingly. Hence, further studies should develop a measurement instrument to measure both the process and the outcome.

Second, there is a need to study further the validity of the Korean translations of the research instruments used in this study. Representatively, the 'Questionnaire on Informal Workplace Learning Outcomes' used in this study was developed and reported by Kyndt et al. (2014). This was translated into Korea under the necessity of this research and used after verification by experts and pilot test. Although a back-translation technique was used to minimize the inaccurate translation of the instrument (Brislin, 1980), a few core variables needed to be modified. For example, the word 'reflect' in question No.1 of the informal workplace learning outcomes (IWLO) questionnaire was simplified in Korean words based on the experts' opinion that nurses do not use such word in their daily routine and may have difficulties interpreting it. Therefore, it is required to examine the validity and the reliability of the research

instruments ('Questionnaire on Informal Workplace Learning Outcomes', 'Learning Motivation', 'Empowerment', and 'Openness of Team's Communication') used in this study for active future research on informal learning in Korea.

Third, subjects need be diversified and fragmented. The present study focused on nurses in large hospitals in Korea. Organizational culture or support for nurses' learning and nurses job responsibilities vary across hospitals depending on their sizes, which is a challenge in probability sampling. Thus, the present study selected five hospitals using purposive sampling. Hence, the present findings are limited in terms of their generalizability to all white-collar workers. Additionally, further studies should include different sizes of hospitals to examine the differences among them.

Fourth, different industries and jobs should be considered in future researches. The targets of this study are limited to nurses in large hospitals. Nurses belong to a specialized job, which requires high-level occupational knowledge and perform high-level techniques in practice. The individual factors (task variety, task significance, friendship with other nurses, and learning motivation) and the organizational factors (empowerment, leadership-committed learning environment, perception of team's support and openness of team's communication) handled in this study are influenced by characteristics of duties performed by individuals and environments to fulfill duties. Therefore, a study on a variety of occupational categories in addition to nursing is needed.

Lastly, the effects of informal learning on actual job performance of workers need to be investigated. Even though informal learning has been extensively explored, most studies have concerned the variables relevant to informal learning. However, considering that companies

encourage their employees to learn with an aim to achieve organizational outcomes, it is

necessary to establish the relationship between informal learning outcomes and job performance

to demonstrate the importance of informal learning. To determine the relationship between the

learning outcomes and job performance, future studies should design a longitudinal study

measuring the effects of parameters over time rather than a cross-sectional design measuring

parameters at a single point of time. As the present study measured the informal learning at a

certain point of time, it failed to consider the contextual changes within organizations. Hence,

longitudinal data, including quarterly or yearly measurements, would be beneficial for

establishing the relationship between informal learning outcomes and job performance.

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APPENDIX A

IRB APPROVAL LETTER

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Office of the Vice Chancellor for Research

Office for the Protection of Research Subjects
528 East Green Street
Suite 203
Champaign, IL 61820

April 7, 2016

K Peter Kuchinke
Ed Organization and Leadership
355 Education Bldg
1310 S 6th St

RE: *The Influence of Individual and Organizational Variables on Informal Learning Among Nurses in a Korean Hospital*
       IRB Protocol Number: 16743

Dear Dr. Kuchinke:

Thank you for submitting the completed IRB application form for your project entitled *The Influence of Individual and Organizational Variables on Informal Learning Among Nurses in a Korean Hospital.* Your project was assigned Institutional Review Board (IRB) Protocol Number 16743 and reviewed. It has been determined that the research activities described in this application meet the criteria for exemption at 45CFR46.101(b)(2).

This determination of exemption only applies to the research study as submitted. Please note that additional modifications to your project need to be submitted to the IRB for review and exemption determination or approval before the modifications are initiated.

Copies of the attached, date-stamped consent form are to be used when obtaining informed consent. If there is a need to revise or alter the consent form, please submit the revised form for IRB review, approval, and date-stamping prior to use.

Exempt protocols will be closed and archived five years from the date of approval. Researchers will be required to contact our office if the study will continue beyond five years. If an amendment is submitted once the study has been archived, researchers will need to submit a new application and obtain approval prior to implementing the change.

We appreciate your conscientious adherence to the requirements of human subjects research. If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me at OPRS, or visit our website at http://oprs.research.illinois.edu

Sincerely,

Michelle Lore

Michelle Lore, MS
Human Subjects Research Specialist, Office for the Protection of Research Subjects

Attachment(s)

U of Illinois at Urbana-Champaign • IORG0000014 • FWA #00008584
telephone (217) 333-2670 • *fax* (217) 333-0405 • *email* IRB@illinois.edu

APPENDIX B
RECRUITMENT LETTER

Dear Dr. Young Kim,

I am Da Ye Lee who is a doctoral student majoring in Human Resource Development in College of Education at the University of Illinois at Urbana-Champaign. Currently, I am interested in the study entitled 'The Influence of Individual and Organizational Variables on Informal Learning among Nurses in Korean Hospitals'. My advisor, Dr. Kuchinke and I would like to include you in a research project to explore Korean nurses' informal learning process into practice. As having many excellent experienced as a Professor of Nursing Department at Korean National Open University and the former President at Korean Association of Occupational Health Nurses, you are in a unique position to enhance knowledge and understanding about educating program of nurses in Korean context. The purpose of this study is to identify statistically the relationship among variables influencing informal learning of nurses in Korean hospitals considering individual nurse's learning and job characteristics in their different organizational contexts. Hence, this research specially focuses on how nurses informally learn knowledge related to their jobs and identifying which factors influence their informal learning effectively.

In this research, an online questionnaire consisting of 5-point scale and open-ended questions will be used. The total survey will take approximately 15 minutes to complete. As considering the purpose of the study, we prefer that a participant who completed the preceptorship training – this means that a participant has to have at least 6 months' experience in the hospital. All data collected through the survey will be kept in strict confidence. Your participation in this project is completely voluntary. Your choice to participate or not will not impact your current job at the Hospital. If interested, please contact Da Ye Lee by telephone at 1-217-751-2535 or by e-mail dayelee2@illinois.edu.

If you have any questions about this research project, please feel free to contact me either by e-mail, or telephone. Thank you for your consideration to participate.

Sincerely,

Da Ye Lee

DATA COLLECTION INSTRUMENTS

Online Questionnaire and Consent Letter

Opening Statement and Consent Form

Welcome

Hello!

I am Da Ye Lee, a graduate student at the University of Illinois, Urbana-Champaign and conducting this study to collect data of preceptorship process as a fulfillment of the requirements for the degree of Doctor of Philosophy in Human Resource Development. The study will examine the informal learning ('experiential, non-routine, and tacit' learning takes place in a much wider variety of settings than a traditional training setting although people are not always consciously aware of it) process at the individual level as well as organizational level. This study will find out the most effective factors of influencing workplace learning of nurses in different conditions and implications for the future practice in hospitals.

You are receiving a link to this survey by e-mail invitation because your organization is successfully encouraging a learning environment and will be able to give us valuable insights into the issues we are examining. Your participation will be greatly appreciated.

In this research, you will be asked to response structured questions based on your previous informal learning experience. The total survey will take approximately 15 minutes to complete. All data collected through the survey will be kept in strict confidence. If there are any questions that you do not want to answer, you are not obligated to do so. Your participation in this research is completely voluntary. You are also free to withdraw your participation at any time and for any reason without penalty. Your answers will not be shared with the hospital or your managers, nor your participation will not be affect your relationship with the hospital in any way.

To thank you for participating in this study, you will receive a $5 gift card for Starbucks via e-gift card after you complete the survey. If you have any questions about this research project, please feel free to contact Da Ye Lee by telephone at 1-217-751-2535 or by e-mail dayelee2@illinois.edu or Professor K. Peter Kuchinke at 1-217-333-0807 or by e-mail kuchinke@illinois.edu.

Thank you for considering participating.

I have read and understand the above information and voluntarily agree to participate in the research project described above. By clicking the AGREE button to enter the survey, I indicate my willingness voluntarily take part in the study.

In general, we will not tell anyone any information about you. When this research is discussed or published, no one will know that you were in the study. However, laws and university rules might require us to disclose information about you. For example, if required by laws or University Policy, study information may be seen or copied by the following people or groups: a) The university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for the Protection of Research Subjects, or b) University and state auditors, and Departments of the university responsible for oversight of research.

If you have any questions about your rights as a research participant, please contact the Institutional Review Board at 217-333-2670 or irb@illinois.edu.

Please read the following items and check those that best represent your viewpoints.

Strongly Disagree ① ② ③ ④ ⑤ Strongly agree
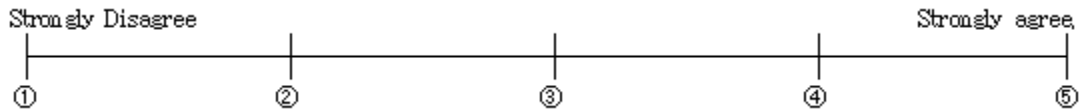
1. Informal Workplace Learning Outcomes

(Through my daily practice, I have learned . . .)

1) to reflect critically and constructive about my own professional conduct
2) to optimize my own professional conduct based on reflection and feedback
3) to reflect autonomously, critically and constructive on the functioning of my team, my colleagues and the organization
4) to develop my own talents and competences to achieve professional development
5) to communicate orally and in writing with professionals about vocational topics
6) to use time and means efficiently when carrying out socio-educational care tasks and activities in order to achieve a maximal result with a minimum of time and means
7) to estimate problems, hindrances or opportunities in advance and to anticipate them
8) to search for and make the most of opportunities, to take initiative by launching new ideas and taking action without waiting for others to take action
9) to form a thoroughly considered opinion and to undertake action and take responsibility for it at the right moment
10) to acquire and process vocational information autonomously
11) to build up and maintain a counselling relation with clients (patients) offering them the requested assistance and services
12) to guide and manage tasks during the handover time
13) to manage a good communication with clients (a doctor in charge)
14) to organize and guide processes of task related documents
15) to design a reflection process and an improvement plan for task related mistakes
16) to participate in policy development and policy implementation
17) to fulfil managerial tasks autonomously
18) to pay attention to the broader context in which I work
19) to develop an understanding and involvement with regard to ethical, normative and social questions

2. Task Variety and Significance

1) The job requires me to do many different things at work, using a variety of your skills and talents.
2) The job requires me to use a number of complex or high-level skills.
3) The job is quite simple and repetitive.
4) This job is one where a lot of other people can be affected by how well the work gets done.
5) The job itself is very significant or important in the broader scheme of things.
6) The results of my work are likely to significantly affect the lives or well-being of other people.

3. Friendship with Other Nurses

1) I have the opportunity to get to know my coworkers.
2) I am able to work with my coworkers to collectively solve problems.
3) I have the opportunity to develop close friendships at my workplace.

4) Communication among employees is encouraged by my organization.
5) I have formed strong friendships at work.
6) I can confide in people at work.
7) I socialize with coworkers outside the workplace.
8) Being able to see my coworkers is one reason I look forward to my job.
9) Informal talk is tolerated by my organization as long as the work is completed.
10) I feel I can trust many coworkers a great deal.
11) In my organization I have the opportunity to talk informally and visit with others.

4. Learning Motivation

1) I prefer to do things that I can do well rather than things that I do poorly.
2) The things I enjoy the most are the things I do the best.
3) The opinions others have about how well I can do certain things are important to me.
4) I feel smart when I do something without making any mistakes.
5) I like to be fairly confident that I can successfully perform a task before I attempt it.
6) I like to work on tasks that I have done well on in the past.
7) The opportunity to do challenging work is important to me.
8) When I fail to complete a difficult task, I plan to try harder the next time I work on it.
9) I prefer to work on tasks that force me to learn new things.
10) When I have difficulty solving a problem, I enjoy trying different approaches to see which one will work.
11) The opportunity to learn new things is important to me.
12) The opportunity to extend the range of my abilities is important to me.

5. Empowerment

1) My manager gives me the authority I need to make decisions that improve work processes and procedures.
2) My manager gives me the authority to make changes necessary to improve things.
3) My manager delegates authority to me that is equal to the level of responsibility that I am assigned.
4) My manager holds me accountable for the work I am assigned.
5) I am held accountable for performance and results.
6) My manager holds people in the department accountable for customer satisfaction.
7) My manager tries to help me arrive at my own solutions when problems arise, rather than telling me what he/she would do.
8) My manager relies on me to make my own decisions about issues that affect how work gets done.
9) My manager encourages me to develop my own solutions to problems I encounter in my work.
10) My manager shares information that I need to ensure high quality results.
11) My manager provides me with the information I need to meet customers' needs.

6. Learning-committed Leadership

1) My manager creates informal learning opportunities
2) My manager serves as developers (coaches and mentors)
3) My manager visibly supports and makes space for learning
4) My manager encourages risk taking
5) My manager instills the importance of sharing knowledge and developing others
6) My manager gives positive feedback and recognition
7) My manager serves as role models

7. Perception of Team's Support

1) My organization strongly considers my goals and values.
2) My organization really cares about my well-being.
3) My organization shows very little concern for me.
4) My organization would forgive an honest mistake on my part.
5) My organization cares about my opinions.
6) If given the opportunity, my organization would take advantage of me.
7) Help is available from my organization when I have a problem.
8) My organization is willing to help me when I need a special favor.

8. Openness of Team's Communication

1) Work group members engage in open and honest communication.
2) Work group members have no "hidden agendas" or issues.
3) Work group members keep each other informed at all times.
4) Work group members willingly share information with others.
5) Work group members discuss personal issues if they affect jobs performance.
6) Work group members share and accept constructive criticism without making it personal.

Demographic Data

1) What is your age?
   □ Under 24 years old   □ 25- 29 years old   □ 30- 34 years old   □ 35- 39 years old
   □ 40- 44 years old   □ 45- 49 years old   □ Over 5o years old

2) What is your gender?
   □ Female   □ Male

3) How long have you been worked as a staff at this hospital?
   □ Less than 1 year   □ 2 - 4 years   □ 5 - 9 years   □ 10 - 14 years
   □ 15 - 19 years □ More than 20 years

4) What is the highest degree or level of school you have completed? If currently enrolled, highest degree received.
   □ Associate degree   □ Bachelor's degree   □ Master's degree   □ Doctorate degree
   □ other: _____

5) What other professional degrees or certificates do you hold?
   _____

6) What is your specialization?
   □ General wards   □ Intensive care unit (ICU)
   □ Special wards (e.g. Emergency room, Operating room)   □ Outpatient department
   □ Please specify if it is not listed above: _____

7) What is your position?
   □ General-duty nurse (Staff level)   □ Supervisor nurse (Manager level)
   □ Head nurse (Executive level)
   □ Please specify if it is not listed above: _____

온라인 설문지 및 연구참여 동의서

인사말 및 연구참여 동의서

안녕하십니까?

바쁘신 중에도 소중한 시간을 내어 주셔서 깊은 감사의 말씀 드립니다.

저는 미국 일리노이 주립대학 어바나-샴페인에서 쿠친케 (Dr. Kuchinke) 교수의 지도 하에 인적자원개발 박사과정을 공부 중인 이다예라고 합니다. 금번에 저는 연구 논문으로 한국 병원 간호사의 무형식 일터 학습과 관련된 개인 및 조직 특성의 위계적 관계를 심층적으로 탐구하고자 합니다. 이 연구에서의 무형식 일터 학습이란, '일상적인 병원 근무 생활 중에 일어난 비의도적이고 우연적인 경험에 의한 학습'을 의미합니다. 이 연구를 통하여 간호사의 일터 학습에 영향을 주는 특성 요인을 파악하여 추후 병원 내에서의 일터 학습 활성화를 위한 방안을 제안하고자 합니다. 귀하께서 제공하시는 내용은 일터 학습 관련 요인을 탐구하는 본 연구에 큰 도움이 될 것입니다.

본 설문지는 일터 학습, 직무특성 (과업의 다양성, 과업의 중요성), 학습동기, 대인관계, 권한위임, 팀지원인식, 학습지향 리더십, 소통개방성, 인적사항 등 9 개 영역으로 구성되어 있으며, 응답하는데 소요되는 시간은 약 15 분입니다.

설문지를 통해 수집된 모든 데이타는 안전하게 보관되며, 연구 이외의 목적으로 사용되지 않도록 병원관계자 혹은 병원에 공유되지 않을 것입니다. 설문 응답 도중 귀하께서 대답하시기 불편하거나 곤란한 질문에 대해 대답하지 않으실 수 있으며, 귀하의 설문 참여 여부는 전적으로 귀하의 동의 하에 이루어질 것입니다. 그러므로 귀하께서 본 연구에 참여하지 않음으로써 어떠한 불이익이나 불편을 겪지 않으실 것을 약속드립니다.

본 연구의 참여에 대해 감사의 마음을 담아 소정의 상품 (5000 원 상당의 커피 상품권)을 드립니다. 본 연구와 관련하여 궁금하신 점이 있으시다면 본 연구의 연구자인 이다예 (1-217-751-2535, dayelee2@illinois.edu) 또는 쿠친케 교수 (1-217-333-0807, kuchinke@illinois.edu) 에게 연락하여 주시기 바랍니다.

연구자 이다예, 쿠친케 배상

본인은 위에 제시된 정보를 이해하였으며, 본 연구에 자발적으로 참여하겠습니다. 아래의 'AGREE' 버튼을 클릭함으로써 본 설문 연구에 참여할 것을 동의합니다.

일반적으로 연구자는 귀하에 관한 어떠한 정보도 공개하지 않을 것입니다. 혹 본 연구결과가 대중에게 공개되거나 출판될 경우, 누구도 귀하의 본 연구 참여여부에 대해 알 수 없을 것입니다. 그러나, 관계 법령과 대학당국의 절차에 따라 연구자가 귀하의 정보를 제출하여야 할 경우도 있습니다. 이 경우, 본 연구에 대한 정보가 다음의 관계자(혹은 그룹)에게 제공될 수 있습니다: a) 본 연구에 대한 심의와 허가를 담당하는 대학협의회 관계자, Institutional Review Board 및 연구대상자 권리보호국, b) 대학과 주(연방) 관리감사관 및 주(연방) 연구 관리감독 부서. 이외 귀하께서 본 연구에 참여함으로써 발생할 수 있는 권리 침해 혹은 의무에 대해 궁금하신 점이 있다면 Institutional Review Board (1-217-333-2670, irb@illinois.edu) 로 연락하여 주시기 바랍니다.

각 문항을 읽고 귀하의 생각을 가장 잘 나타내는 곳에 체크하여 주시기 바랍니다.

전혀 그렇지 않다 ① ② ③ ④ ⑤ 매우 그렇다
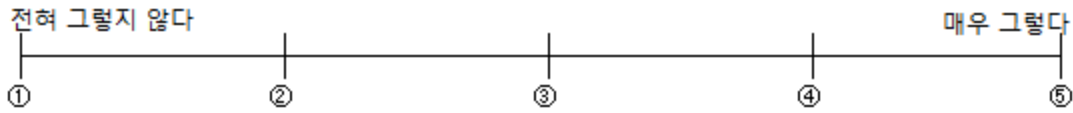
1. 무형식 일터 학습 결과

(일상의 직무수행 과정에서의 학습 결과...)

1) 내 직무 수행 과정에 대해 스스로 건설적으로 비판하는 방법을 학습하였다.
2) 내 직무 수행에 대한 반성적 사고와 피드백을 바탕으로 수행 결과를 최적화 하는 방법을 학습하였다.
3) 팀과 조직의 일원으로서 직무를 성공적으로 수행하고 이를 비판적으로 되돌아 보는 방법을 학습하였다.
4) 전문성 개발을 위해 내 업무 능력 및 기술을 습득하는 방법을 학습하였다.
5) 직무와 관련된 전문적인 내용을 말과 글을 통하여 다른 동료들과 원활하게 소통할 수 있는 방법을 학습하였다.
6) 최소한의 시간과 노력으로 최대의 효과를 얻기 위해 어떻게 효율적으로 시간과 노력을 사용해야 하는지 학습하였다.
7) 직무와 관련된 문제인지, 장애인지, 기회인지 미리 판단하고 예상하는 방법을 학습하였다.
8) 다른 사람의 판단이나 의견을 기다리지 않고 내 스스로 기회나 새로운 아이디어를 찾아 실행하는 방법을 학습하였다.
9) 직무 수행시 적절한 시기에 중요한 의견이나 책임감이 따르는 일을 제안하는 방법을 학습하였다.
10) 직무와 관련된 정보를 독자적으로 습득하는 방법을 학습하였다.
11) 환자 및 보호자의 요구에 적절히 응하여 처리하는 방법을 학습하였다.
12) 인계 시간에 수행해야 하는 업무에 대하여 학습하였다.
13) 담당의와의 원활한 의사소통 방법에 대하여 학습하였다.
14) 직무와 관련해 문서 작업에 필요한 내용을 학습하였다.
15) 직무 수행시 발생한 실수와 관련해 스스로 깊게 생각하고, 개선방안을 세우는 방법을 학습하였다.
16) 직무 수행과 관련해 팀이나 조직의 정책 수립과 실행과정에 참여하게 되었다.
17) 독자적으로 직무 내용을 관리할 수 있게 되었다.
18) 내가 일하는 파트 외에 더 넓은 조직 맥락에서 일의 흐름을 파악할 수 있게 되었다.
19) 내 업무와 관련된 윤리사회적 문제를 이해하고 이와 관련한 업무에 참여하게 되었다.

2. 직무특성

1) 내가 하는 일은 다양한 기술과 능력을 요구하는 여러 업무들로 구성되어 있다.
2) 내가 하는 일은 매우 높은 수준의 복잡한 전문 기술을 요구한다.

3) 내가 하는 일은 매우 단순하고 반복적이다.
4) 내가 하는 일은 다른 사람들에게 많은 영향을 준다.
5) 내가 하는 일은 조직 전체로 볼 때 매우 중요하다.
6) 내가 하는 일은 일의 결과에 따라 많은 사람들의 삶에 중요한 영향을 준다.

3. 대인관계

1) 내게는 내 동료들과 친해질 기회가 많다.
2) 나는 문제가 발생하였을 때 동료들과 협력하여 문제를 해결할 수 있다.
3) 나는 직장 내에서 가까운 친분 관계를 만들 기회가 있다.
4) 우리 조직은 동료들 간의 활발한 의사소통을 장려한다.
5) 나는 직장에서 동료들과 강한 유대관계를 맺고 있다.
6) 나는 직장에서 비밀을 털어놓을 만한 동료가 있다.
7) 나는 직장 밖에서도 동료들과 만나거나 연락한다.
8) 동료들과의 좋은 관계가 내 일을 좋아하는 중요한 이유 중 하나이다.
9) 업무가 잘 완료되는 한, 업무 중의 일상 관련 대화도 용인되는 편이다.
10) 나는 내 동료들을 진심으로 신뢰할 수 있다고 생각한다.
11) 우리 병원은 다른 부서의 동료들과 자주 만나고 이야기 할 기회가 많다.

4. 학습동기

1) 나는 '잘 못하는 일'보다 '잘 할 수 있는 일'을 더 좋아한다.
2) 내가 제일 즐기는 일들은 내가 제일 잘하는 일들이다.
3) 나는 나의 성과에 관한 다른 사람들의 평가를 중요하게 생각한다.
4) 나는 어떤 일을 실수 없이 했을 때, 스스로 똑똑하다고 느낀다.
5) 나는 어떤 일을 시작하기 전에 내가 성공적으로 수행할 수 있다고 여겨지는 일을 좋아한다.
6) 나는 과거에 성공적으로 수행했던 업무를 다시 하는 것을 좋아한다.
7) 나는 도전적으로 일할 수 있는 기회를 중요하게 여긴다.
8) 나는 잘 못하는 일이 있으면, 더 잘하기 위해 노력한다.
9) 나는 새로운 것을 배울 수 있는 일을 더 선호한다.
10) 나는 어려운 문제를 여러 가지 방법으로 해결해 보는 것을 좋아한다.
11) 나는 모르는 것을 배울 수 있는 기회를 중요하게 여긴다.
12) 나는 나의 능력을 개발할 수 있는 기회를 중요하게 여긴다.

5. 권한위임

1) 나의 상사는 업무 프로세스와 절차 향상을 위한 결정권을 나에게 준다.
2) 나의 상사는 업무 개선이 필요할 경우 변화시킬 수 있는 권한을 준다.

3) 나의 상사는 나에게 부여된 책임과 동일한 수준의 권한을 부여한다.
4) 나의 상사는 내가 맡은 일에 대한 책임을 갖게 한다.
5) 나는 나의 성과와 결과물에 대한 책임이 있다.
6) 나의 상사는 부서 내 직원들에게 고객 (내원 환자) 만족에 대한 책임을 묻는다.
7) 나의 상사는 문제가 발생했을 때, 자신이라면 이렇게 할 것이라 말하기보다는 나 자신만의 해결책을 찾을 수 있도록 도와준다.
8) 나의 상사는 업무결과에 영향을 미치는 이슈에 대하여 내가 스스로 의사결정을 내릴 수 있도록 한다.
9) 나의 상사는 내가 업무상 겪게 되는 문제에 대하여 나 스스로 해결책을 찾을 수 있도록 격려한다.
10) 나의 상사는 내가 최고의 성과를 내기 위해 필요한 정보를 나와 공유한다.
11) 나의 상사는 내가 고객 (내원 환자) 의 요구에 부응하기 위해 필요한 정보를 제공해 준다.

6. 학습지향 리더십

1) 나의 상사는 다양한 학습의 기회를 제공한다.
2) 나의 상사는 내가 알고자 하는 바를 이해하기 쉽도록 상세하게 설명해 준다.
3) 나의 상사는 직장 내 학습 공간을 마련하고 관련 자원을 지원하는데 적극적이다.
4) 나의 상사는 학습하는데 있어서 위해요소가 있더라도 학습을 권장한다.
5) 나의 상사는 동료와 지식을 공유하고, 협력적으로 일하는 것을 중요하게 생각한다.
6) 나의 상사는 내 업무에 대해 인정해 주고, 긍정적으로 피드백해 준다.
7) 나의 상사는 학습에 있어 나의 역할 모델이다.

7. 팀지원 인식

1) 우리 조직은 내가 병원을 위해 기여한 바가 가치 있는 일이라고 여긴다.
2) 우리 조직은 조직원들 개인의 목표와 가치를 아주 중요하게 생각한다.
3) 우리 조직은 내게 거의 관심을 갖지 않는다.
4) 우리 조직은 내 업무 중의 명백한 실수에 대해 용인해 준다.
5) 우리 조직은 내 의견에 관심이 많다.
6) 우리 조직은 의사결정 시 조직원들의 이익보다 조직의 이익을 최우선으로 고려한다.
7) 내게 어려움이 있을 때, 나는 우리 조직으로부터 유용한 도움을 억을 수 있을 것이다.
8) 우리 조직은 어려운 부탁을 할 때 기꺼이 도와 줄 것이다.

8. 소통 개방성

1) 우리 팀 구성원간의 의사소통은 대체로 개방적이고 진술하다.
2) 우리 팀은 숨기고 있는 사안이나 이슈가 없다.
3) 우리 팀 구성원은 항상 정보를 공유하고 있다.

4) 우리 팀 구성원들은 거리낌 없이 다른 팀 구성원들과 정보를 공유한다.

5) 우리 팀 구성원들은 직무성과와 관련 있는 일이라면 개인적인 문제도 이야기 한다.

6) 우리 팀 구성원은 건설적인 비판을 기꺼이 수용한다.

개별 인적사항

1) 귀하의 나이는 어떻게 되십니까?

□ 24 세 이하　　　　□ 25 - 29 세 사이　　　□ 30- 34 세 사이　　　□ 35- 39 세 사이
□ 40- 44 세 사이 □ 45- 49 세 사이 □ 50 세 이상

2) 귀하의 성별은 어떻게 되십니까?

□ 여성　　　　　　□ 남성

3) 귀하께서 현재 직장에서 근무하신 경력은 얼마나 되십니까?

□ 1 년 이하　　　　□ 2 - 4 년 사이　　　□ 5 - 9 년 사이　　　□ 10 - 14 년 사이
□ 15 – 19 년 사이　　□ 20 년 이상

4) 귀하의 최종 학력은 어떻게 되십니까?

□ 3 년제 간호대 졸　　　　　　　　　□ 4 년제 간호대 졸
□ 대학원 과정 중 혹은 졸업 (석사)　　　□ 대학원 과정 중 혹은 졸업 (박사)
□ 그 외: _____

5) 이 외의 전문 학위 혹은 자격증이 있으십니까?

_____

6) 귀하의 현재 근무 부서는 무엇입니까?

□ 일반 병동　　　　□ 중환자실　　　□ 특수 부서 (응급실, 수술실 등)
□ 외래　　　　　　□ 그 외: _____

7) 귀하의 현재 직위는 무엇입니까?

□ 일반 간호사 (스탭)　　　　　　□ 책임 간호사 (대리급)
□ 수 간호사 (과장/차장급 이상)　□ 그 외: _____

APPENDIX D

SUMMARY OF THE RESULTS OF CONFIRMATORY FACTOR ANALYSIS

Path	Estimates	Standar- dized estimates	SE	t	CR	AVE
Informal Workplace Learning Outcomes						
1← the generic learning outcomes	1	0.507			0.845	0.580
2← the generic learning outcomes	1.286	0.587	0.177	7.626**		
3← the generic learning outcomes	1.417	0.691	0.188	7.546**		
4← the generic learning outcomes	1.365	0.679	0.179	7.610**		
5← the generic learning outcomes	1.546	0.515	0.167	7.892**		
6← the generic learning outcomes	1.224	0.615	0.148	8.246**		
7← the generic learning outcomes	1.421	0.705	0.164	7.657**		
8← the generic learning outcomes	1.351	0.754	0.158	8.579**		
9← the generic learning outcomes	1.307	0.712	0.156	8.384**		
10← the generic learning outcomes	1.079	0.616	0.137	7.879**		
11← the job-specific learning outcomes	1	0.522			0.851	0.536
12← the job-specific learning outcomes	1.870	0.706	0.223	8.371**		
13← the job-specific learning outcomes	1.849	0.702	0.225	8.217**		
14← the job-specific learning outcomes	1.646	0.632	0.210	7.852**		
15← the job-specific learning outcomes	1.468	0.568	0.172	7.351**		
16← the organisational-level learning outcomes	1	0.511			0.801	0.505
17← the organisational-level learning outcomes	1.244	0.620	0.161	7.737*		
18← the organisational-level learning outcomes	1.355	0.740	0.174	7.799*		
19← the organisational-level learning outcomes	1.343	0.651	0.172	7.825**		
Task Variety						
1← task variety	1	0.766			0.859	0.610
2← task variety	1.242	0.809	0.087	14.316**		
3← task variety	1.240	0.807	0.089	13.919**		
Task Significance						
1← task significance	1	0.741			0.998	0.997
2← task significance	1.222	0.996	0.059	20.605**		
3← task significance	0.692	0.580	0.062	11.220**		
Friendship with Other Nurses						
1← friendship with other nurses	1	0.715			0.919	0.695
2← friendship with other nurses	1.096	0.733	0.084	12.989**		
3← friendship with other nurses	1.174	0.766	0.091	12.970**		
4← friendship with other nurses	1.187	0.788	0.089	13.336**		
5← friendship with other nurses	1.161	0.670	0.101	11.505**		
6← friendship with other nurses	1.289	0.897	0.069	10.594**		
7← friendship with other nurses	1.327	0.907	0.089	14.954**		
8← friendship with other nurses	1.291	0.893	0.087	14.890**		
9← friendship with other nurses	0.761	0.564	0.077	9.901**		
10← friendship with other nurses	1.049	0.687	0.079	10.395**		

Path	Estimates	Standar-dized estimates	SE	t	CR	AVE
11← friendship with other nurses	1.288	0.898	0.084	12.840**		
Learning Motivation						
1← performance goal orientation	1	0.578			0.822	0.441
2← performance goal orientation	1.128	0.580	0.139	8.097**		
3← performance goal orientation	0.758	0.448	0.126	6.027**		
4← performance goal orientation	0.738	0.404	0.134	5.560**		
5← performance goal orientation	1.119	0.650	0.156	7.192**		
6← performance goal orientation	1.220	0.611	0.179	6.838**		
7← learning goal orientation	1	0.715			0.915	0.644
8← learning goal orientation	0.638	0.529	0.070	9.169**		
9← learning goal orientation	1.104	0.772	0.082	13.452**		
10← learning goal orientation	0.960	0.662	0.085	11.254**		
11← learning goal orientation	0.898	0.744	0.079	11.438**		
12← learning goal orientation	0.848	0.709	0.077	11.014**		
Empowerment						
1← delegation of authority	1	0.807			0.882	0.715
2← delegation of authority	0.983	0.833	0.059	15.747**		
3← delegation of authority	0.895	0.695	0.068	13.076**		
4← accountability	1	0.845			0.821	0.614
5← accountability	0.725	0.691	0.062	11.785**		
6← accountability	0.741	0.522	0.088	8.441**		
7← self-directed decision Making	1	0.771			0.894	0.738
8← self-directed decision Making	0.992	0.866	0.059	16.825**		
9← self-directed decision Making	1.008	0.840	0.062	16.252**		
Learning-committed Leadership						
1← Learning-committed leadership	1	0.706			0.907	0.620
2← Learning-committed leadership	1.046	0.771	0.076	13.719**		
3← Learning-committed leadership	0.947	0.710	0.078	12.486**		
4← Learning-committed leadership	1.183	0.830	0.083	14.271**		
5← Learning-committed leadership	1.015	0.727	0.080	12.670**		
6← Learning-committed leadership	1.226	0.846	0.084	14.547**		
7← Learning-committed leadership	1.215	0.701	0.097	10.223**		
Perception of Team's Support						
1← perception of team's support	1	0.550			0.927	0.564
2← perception of team's support	1.160	0.634	0.126	9.235**		
3← perception of team's support	1.204	0.579	0.141	8.543**		
4← perception of team's support	1.302	0.664	0.140	9.318**		
5← perception of team's support	1.663	0.765	0.165	10.092**		
6← perception of team's support	1.372	0.742	0.138	9.959**		
7← perception of team's support	1.536	0.735	0.157	9.814**		
8← perception of team's support	1.079	0.516	0.136	7.936**		

Path	Estimates	Standar-dized estimates	SE	t	CR	AVE
Openness of Team's Communication						
1← openness of team's communication	1	0.732			0.915	0.644
2← openness of team's communication	1.222	0.794	0.085	14.466**		
3← openness of team's communication	1.186	0.833	0.080	14.879**		
4← openness of team's communication	1.009	0.685	0.083	12.224**		
5← openness of team's communication	1.025	0.711	0.079	12.911**		
6← openness of team's communication	1.020	0.727	0.078	13.118**		

** $p < 0.01$