THE RELATIONSHIPS AMONG INVESTMENT IN WORKPLACE LEARNING, ORGANIZATIONAL PERSPECTIVE ON HUMAN RESOURCE DEVELOPMENT, ORGANIZATIONAL OUTCOMES OF WORKPLACE LEARNING, AND ORGANIZATIONAL PERFORMANCE USING THE KOREA 2005 AND 2007 HUMAN CAPITAL CORPORATE PANEL SURVEYS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By

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* * * * *

The Ohio State University
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ABSTRACT

The purpose of this study was to investigate the relationships among investment in workplace learning, organizational perspective on human resource development (HRD), organizational outcomes of workplace learning, and organizational performance using the 2005 and 2007 Human Capital Corporate Panel (HCCP) surveys in Korean companies. The conceptual model proposed that investment in workplace learning was assumed to influence organizational outcomes of workplace learning, which affect in turn organizational financial performance. In addition, organizational perspective on HRD was expected to moderate between investment in workplace learning and organizational outcomes of workplace learning. The current study utilized nationally-representative datasets from the 2005 and 2007 HCCP surveys in South Korea to examine these relationships specified in the model at organizational level. In addition, the data were analyzed using structural equation modeling.

The results showed a significantly positive relationship between investment in workplace learning and organizational outcomes of workplace learning. The current research also found a significantly positive relationship between organizational outcomes of workplace learning and organizational performance. In addition, the mediating effects of organizational outcomes of workplace learning were identified between investment in workplace learning and organizational performance.
However, the moderating effect of organizational perspective on HRD did not exist in the relationship between investment in workplace learning and organizational outcomes of workplace learning. Moreover, this study compared two groups, manufacturing industry and non-manufacturing industry, to determine whether the conceptual model proposed in this study was the same for both the manufacturing industry and the non-manufacturing industry, using multiple-group SEM models. The results showed that there was a statistical difference in terms of the fit in the measurement model and the structural equation model for the manufacturing industry and the non-manufacturing industry. When comparing two industries separately, the manufacturing industry showed greater magnitudes in all paths. But the magnitudes between two groups were not considerably different.

Based on the results of the study, several issues are discussed. Additionally, research directions for future research are recommended, and the both theoretical and practical implications for HRD were provided.
Dedicated to my wonderful journey mates in the USA,

My mother, Busook Nam and my son, Jeongseo (Jason) Yoon

And to my great supporters who have waited for me with sacrifice and loneliness,

My father, Kangil Park and my husband, Jongbaak Yoon
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CHAPTER 1

INTRODUCTION

Today, organizations continue to face environmental change worldwide. Technological advancement, globalization, heightened competition, overnight changes in the global and domestic markets, and dynamic customer demands have created a more volatile and turbulent environment than ever before (Heilmann, 2007; Osman-Gani & Jacobs, 2005; Petridou & Glaveli, 2003; Rothwell & Kolb, 1999). As industries have become more knowledge-based, employees have had to constantly update their knowledge and skills (Burke & Ng, 2006), and firms have recognized their human resources as a key source of sustainable competitive advantage (Rowden, 2007). These have led to identifying employee competence as a significant underlying issue in all organizations (Jacobs, 2001). As the explosion of knowledge and changing environment have severely impacted the workplace, improving employees’ knowledge and skills to meet the challenging work environment has become an essential issue in today’s organizations (Jacobs, 2001; Rowden, 2007; Smith & Hayton, 1999; Shipton, Dawson, West, & Patterson, 2002).

As the need to integrate work and learning have become more obvious (Ellström, 2001), the workplace has been increasingly regarded as the most effective site for developing employee competence (Boud & Garrick, 1999). Workplace learning has been
recognized as a key strategy for organizations to help their employees achieve the expected performance (Clarke, 2005; Enos, Kehrhahn, & Bell, 2003). Workplace learning is defined as learning that occurs during work, including a wide range of learning activities such as structured formal training programs and social interactions among employees (Rowden, 2007). In this sense, workplace learning may be the most appropriate term to describe the variety of employee learning activities in organizations, as the term embraces both formal and informal learning.

In effect, as organizations recognize the essential value of workplace learning in leveraging human resources and improving competitiveness, organizational leaders focus on workplace learning to help employees learn from various activities as a way of improving organizational performance (Aghazadeh, 2007; Doornbos, Simons, & Denessen, 2008; Rainbird, Fuller, & Munro, 2004). Consequently, organizations have invested their financial resources in employee learning, believing that their expenditure will pay off in future performance (Pate, Martin, Beaumont, & McGoldrick, 2000; Tzafrir, 2005). Indeed, many companies, which have significantly invested in workplace learning, are interested in whether workplace learning can lead to positive outcomes for organizations as well as for the employees.

Statement of the Problem

It is commonly believed that investment in employee learning can generate positive performance-related outcomes for organizations (Becker & Huselid, 2006; Bowen & Ostroff, 2004; Heskett, Sasser, & Schlesinger, 2003; Likert & Bowers, 1969). This belief is based on the premise that workplace learning enables employees to improve
their performance, which in turn may lead to organizational success (Aghazadeh, 2007).
Indeed, organizational efforts for employee learning activities may be made with the
belief that workplace learning helps employees and organizations enhance their outcomes
(Muhamad & Idris, 2005). Because organizations are interested in more than just learning
for learning’s sake, learning in the workplace may focus on expected results from

Workplace learning plays a key role in providing employees initial and constant
competence development that enable them to successfully perform their current jobs as
well as fulfill future job requirements (Doornbos, Simons, & Denessen, 2008; Rothwell
& Kazanas, 1989). Employee learning at work can offer organizations a competitive
advantage by providing primary means for organizations to support employee
competence (Clarke, 2005; Jacobs, 2003; Lohman, 2005), which in turn can lead to an
increase of organizational productivity (Muhamad & Idris, 2005). Because the
development of employee skills and knowledge is the key to an organization’s success,
the learning outcomes are important regardless of formal or informal learning in
organizations (Lee & Bruvold, 2003).

However, while the relationship between workplace learning and organizational
performance is commonly accepted in practice, few studies have investigated how
specific variables related to workplace learning influence organizational performance
(Jacobs & Washington, 2003; Tharenou, Saks, & Moore, 2007). That is, there is little
understanding about how workplace learning is related to its outcomes and subsequently
organizational performance.
Numerous studies have identified a positive relationship between training and organizational performance, such as productivity, organizational growth, quality, and employees’ affective state, such as organizational commitment and job satisfaction (Delaney & Huselid, 1996; Delery & Doty, 1996; García, 2005; Lee & Bruvold, 2003; Huselid, 1995; Paul & Anantharaman, 2005; Tzafrir, 2005). However, most studies have focused on training (or training and development) as a formal type of workplace learning rather than comprehensively including both formal learning and informal learning in the workplace. Additionally, only few studies have examined the relationship between training and organizational performance (Aragón-Sánchez, 2003, García, 2005; Russell, Terborg, & Powers, 1985). A majority of studies have included training (or training and development) as part of human resource management (HRM) practices to investigate the association with firm performance especially in the field of human resource management.

Workplace learning, especially training, has been found to be positively related to its various outcomes. Paul and Anantharaman (2005) found that workplace learning directly affects employee productivity, which subsequently influences financial performance. In a similar vein, Tzafrir (2005) found that training in HRM practices is a critical factor in predicting organizational performance. Additionally, Huselid (1995) found that training programs increase the firm specificity of employee skills and subsequently improve employee productivity. Moreover, Aragón-Sánchez, Barba-Aragón, and Sanz-Valle (2003) found companies that make higher investment in their employees’ training are more likely to achieve better results in profitability than are those that make lower investment. Similarly, the research findings of García (2005) in Spanish firms demonstrated that training-oriented policy for human capital development
considerably influences the satisfaction of workers, clients, and owners/shareholders and finally organizational productivity.

Despite results showing a positive relationship between workplace learning and its outcomes, training as workplace learning is found not to be strongly related to the financial aspect of performance (Tharenou, Saks, & Moore, 2007). More specifically, through a meta-analysis of 67 studies, Tharenou, Saks, and Moore (2007) found that a positive relationship between training and financial outcomes exists mostly in the perceptual outcomes and in broadly defined financial performance, rather than in financial objective performance such as profit, return on equity (ROE), return on assets (ROA), and return on investment (ROI). Furthermore, although some conceptual frameworks (Dyer & Reeves, 1995; García, 2005; Guest, 1997; Ostroff & Bowen, 2000; Tharenou, Saks, & Moore, 2007) suggest that workplace learning outcomes mediate the relationship between workplace learning and organizational performance, there is little evidence supporting this view.

As described, there may be an association between workplace learning and organizational performance. However, there exists no clear understanding of how and by which process workplace learning is linked to organizational financial performance. Furthermore, there is little evidence that these relationships differ by industrial sectors. Therefore, the relationship between workplace learning and organizational performance should be uncovered by using a range of variables regarding workplace learning, its outcomes, and organizational performance, along with a comparison of industrial sectors.

If workplace learning is generally viewed as resulting in successful organizational performance, and if there is little understanding of how workplace learning
is related to organizational performance, then we need to know more about how workplace learning influences organizational performance. The purpose of this study was to investigate the relationships among investment in workplace learning, organizational perspective on human resource development (HRD), organizational outcomes of workplace learning, and organizational performance using the 2005 and 2007 Human Capital Corporate Panel (HCCP) surveys in Korean companies.

Research Questions

The following research questions were explored in this study:

1. What is the relationship between investment in workplace learning and organizational outcomes of workplace learning?
2. Does organizational perspective on HRD moderate between investment in workplace learning and organizational outcomes of workplace learning?
3. Do organizational outcomes of workplace learning mediate between investment in workplace learning and organizational performance?
4. What is the relationship between organizational outcomes of workplace learning and organizational performance?
5. Are manufacturing industry and non-manufacturing industry groups different in terms of the fit of the measurement model and the structural equation model?
Definition of Terms

The terms for this study were operationally defined as follows:

Workplace Learning

Workplace learning is defined as a range of learning activities including training programs, education and development courses, or some type of experiential learning activity for acquiring the competence necessary to meet current and future work requirements (Jacobs & Park, 2009). In this respect, incidental learning, which is referred to as an unintended by-product of some other activity (Watkins & Marsick, 1992), is not included in the boundary of workplace learning in this study because it is not regarded as intentional (Rowden, 2007). Furthermore, in this study, non-formal learning is excluded in the scope of workplace learning because non-formal learning seems to be similar to informal learning in practice for describing the contrast to formal learning (Eraut, 2000; Malcolm, Hodkinson, & Colley, 2003). Moreover, the contents of non-formal learning may be planned, but the learning is provided outside organizations such as museums (Mocker & Spear, 1982).

Formal learning

Formal learning refers to structured learning activities with instructors or trainers and planned contents usually away from work (Mocker & Spear, 1982). The major examples of formal learning include traditional classroom-based training, web-based training, training in a corporate university, and tuition reimbursement.
Informal Learning

Informal learning is intentional and planned learning activities through social interactions within the workplace (Enos, Kehrhahn, & Bell, 2003; Koopmans, Doornbos, & Van Eekelen, 2006). Examples of informal learning include talking and sharing resources with others, on-the-job training, networking, coaching, and mentoring (Leslie, Aring, and Brand, 1998; Lohman, 2005; Rowden, 2007).

The types of informal learning may consist of planned form and unplanned form. Regarding the types in informal learning, Lohman (2005) argued that informal learning can be planned or unplanned and structured or unstructured. Similarly, Doornbos, Simons, & Denessen (2008) stated that employee learning may be spontaneous (unintended, unplanned) or deliberate (planned and sought by the worker), arguing that employees consciously or unconsciously engage in learning activities for the purpose of acquiring knowledge, skills, or new attitudes. Informal learning in the current study, as stated above, refers to planned learning; that is, it is intentional interactions with others as social aspects of learning within the workplace (Enos, Kehrhahn, & Bell, 2003; Koopmans, Doornbos, & Van Eekelen, 2006).

Investment in Workplace Learning

Investment in workplace learning refers to organizations investing their financial resources in employee learning activities in the workplace for the purpose of helping employees to gain knowledge and skills through workplace learning.
Organizational Perspective on HRD

Organizational perspective on HRD refers to how organizations view HRD as a critical strategy to leverage employee learning in the workplace.

Organizational Outcomes of Workplace Learning

Organizational outcomes of workplace learning are defined as the organizational level outcomes resulting from employees’ participation or engagement in workplace learning. Organizational outcomes of workplace learning are the non-financial aspect of organizational performance as operational performance (Venkatraman & Ramanujam, 1986). The indicators of workplace learning outcomes include productivity, quality, innovation, absence, turnover, conflict, and quality and service (Dyer & Reeves, 1995; García, 2005; Guest, 1997; Ostroff & Bowen, 2000; Tharenou, Saks, & Moore, 2007).

Organizational Performance

Organizational performance refers to the financial aspect of organizational performance as a final economic goal of firms (Venkatraman & Ramanujam, 1986). In contrast to organizational outcomes of workplace learning which emphasized non-financial outcomes, organizational performance is oriented toward financial profits. The potential indicators of organizational performance include profits, return on investment (ROI), return on assets (ROA), return on equity (ROE), and stock-market performance (e.g., stock value or shareholder returns) (Dyer & Reeves, 1995; García, 2005; Guest, 1997; Tharenou, Saks, & Moore, 2007).
Significance of the Study

This study has both theoretical and practical significance for human resource development (HRD). First, this research investigates workplace learning, outcomes of workplace learning, and organizational performance. Insight into the potential influence of various aspects of workplace learning on organizational performance is crucial for practice, research, and theory building. In spite of recent advances in workplace learning research, no available studies have explored a mechanism of workplace learning and its various outcomes.

Moreover, this study has an integrative approach. The current research considers various relationships, especially the role of mediating variables, such as organizational outcomes of workplace learning, which potentially mediate between workplace learning and organizational financial performance. Previous research has mostly investigated the direct linkage between training as workplace learning and organizational performance, neglecting the workplace learning outcomes. Paul and Anantharaman (2003) recommend examining the relationship between workplace learning and organizational performance: investigating relationships among workplace learning practices, intervening variables (learning outcomes), operational performance indicators, and financial performance.

Therefore, the current research can provide greater understanding in HRD by identifying the process by which workplace learning may influence organizational performance. Considering that the relationship between workplace learning and organizational performance is not clearly explicated (Jacobs & Washington, 2003; Tharenou, Saks, & Moore, 2007), the investigation can provide significant implications for the influence of workplace learning on organizational performance in the HRD field.
Second, this study is also expected to contribute to new knowledge in HRD about workplace learning and its consequences. Previous research in workplace learning in the HRD field has focused relatively less on the outcomes of workplace learning, as compared with studies examining the predictors of engagement or participation in workplace learning. Numerous research in workplace learning has examined contextual factors which inhibit and facilitate workplace learning (Lohman, 2005; Ellinger, 2005; Sambrook, 2005; Sambrook & Stewart, 2000) and investigated what factors influence employee engagement in the various kinds of learning activities (Birdi, Allan, & Warr, 1997; Doombos, Simons, & Denessen, 2008; Maurer & Tarulli, 1994; Maurer, Weiss, & Barbeite, 2003; Noe, 1996; Noe & Wilk, 1993; Xiao & Tsang, 2004). As such, little attention has been paid to the linkage between workplace learning and its outcomes.

Additionally, because this study includes both outcomes directly derived from workplace learning and subsequent organizational financial performance, this research is expected to demonstrate how workplace learning is ultimately related to business profits. Indeed, empirical studies on the influence of workplace learning on organizational financial performance have been rare. HRD research has predominantly measured training influences in terms of individual perceptions on satisfaction, learning, and commitment (Ahmad & Bakar, 2003; Al-Emadi & Marquardt, 2007; Bartlett, 2001; Bartlett & Kang, 2004; Rowden, 2002; Rowden & Ahmad, 2000; Sahinidis & Bouris; 2008). Therefore, understanding the influence of workplace learning on its outcomes as well as business profits may enable organizations to maximize the effectiveness of employee learning.
Third, this research can provide new knowledge in HRD by offering meaningful implications because it embraces both formal and informal learning as a boundary of workplace learning. These two types of learning have been rather overlooked in previous research in workplace learning. Given the reality that employees engage in both formal and informal learning to acquire new knowledge and skills, inclusion of both types of learning may accurately describe a variety of learning activities in the workplace (Leslie, Aring, & Brand, 1997; Rowden, 2002; Rowden, & Ahmad, 2000).

Finally, this study can overcome measurement limitations frequently pointed out in previous research. Prior research has suggested a time interval when organizational performance is measured after workplace learning activities. However, cross-sectional designs have been overused by collecting data through observations of many subjects at the same time without considering differences in time, when a relationship between workplace learning (usually training) and organizational performance is examined. Therefore, prior research with cross-sectional estimates had a simultaneity bias (Delaney & Huselid, 1996).

This study used the measures of the financial aspect of organizational performance obtained two years after (at the end of 2006) the implementation of workplace learning practices provided by the organization (as of 2004). Lack of a time lag in research investigating the HR-firm performance relationship is indicated as resulting in measurement error caused by time (Wright, Gardner, Moynihan, Park, Gerhart, & Delery, 2001). A time frame is especially required for measuring the influence of workplace learning on organizational performance. Thus, this study is able to
assess whether workplace learning in organizations can contribute to positive organizational performance.

Furthermore, the current study can bring about more reliable results for the linkage between workplace learning and organizational performance, because it used several objective measures, such as sales per employee, net profit per employee, gross margin, and return on asset (ROA), rather than subjective indicators to measure the organizational performance. The use of the quantitatively objective information for the financial performance has been recommended in the prior research (e.g., Paul & Anantharaman, 2003). Indeed, most previous studies connecting training (or HRM practices) and organizational performance have used subjective indicators to measure organizational performance by asking each organization to rate the company’s performance in comparison with other companies involved in industry (Delaney & Huselid, 1996; Paul & Anantharaman, 2003).

Accordingly, the use of objective indicators for the financial performance in this study can avoid the potential problems of common method variance, because the sources of data were different for data of workplace learning outcomes and data of organizational financial performance (Podsakoff & Organ, 1986). That is, the questions for workplace learning outcomes were asked by HRD managers and organizations’ financial data were obtained from Korea Information Service (KIS) which provides companies’ financial information. The common method variance is likely to occur when the respondents are asked their perceptions regarding both independent variables and dependent variables. In this case, responses of dependent variables may make the results inflated; respondents who respond to workplace learning outcomes may also tend to report their perceptions of
financial performance positively (Delaney & Huselid, 1996; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). At the same time, because this study allows the time gap between workplace learning practices and manifestation of organizational performance, this study can overcome the potential problems of measurement error due to time, common method biases.

Limitations of the Study

The results of this study are limited by the data used. The limits of the data and measures from HCCP constrain the attempts to create constructs for measuring variables related to workplace learning more precisely. In addition, a high level of missing data in the investment in workplace learning restrained the intentions to measure various learning activities, which are occurring in the workplace.
CHAPTER 2

REVIEW OF LITERATURE

This chapter consists of five major sections. The first section focuses on theories in human resource development (HRD) and provides definitions of HRD. The second section discusses workplace learning. The third section reviews outcomes of workplace learning. The fourth section discusses the relationship between workplace learning and organizational performance. The final section proposes a conceptual framework of this study based on the literature review.

Human Resource Development

This section is organized in two parts. The first part describes theories in HRD. The second part discusses the definitions of HRD.

Theories in Human Resource Development

Human resource development is an interdisciplinary body of knowledge in nature (Jacobs, 1990). An interdisciplinary body of knowledge refers to the notion that it is composed of several related areas. HRD is an applied discipline that draws upon multiple theories in articulating its disciplinary base (Swanson, 2001). Kuchinke (2001)
argued that HRD needs to be viewed as a field of study with multiple disciplines rather than as a single discipline.

In this respect, several HRD researchers have provided the underlying theories of HRD. For example, Jacobs (1990) identified that HRD is composed of various bodies of knowledge: education, systems theory, economics, psychology, and organizational behavior. He argued that these bodies of knowledge interact in complex ways to form the discipline called HRD. Similarly, Swanson (2001) suggested the integration of psychological theory, economic theory, and systems theory as the theoretical foundation of HRD.

Each body of knowledge has made a different and unique contribution to HRD. Education, for example, has contributed at least three major sets of ideas: adult learning theory, different instructional methods and media, and a general orientation toward the world of work and how people select and prepare for occupations (Jacobs, 1990). Systems theory has contributed systems analysis for solving problems and the awareness that all things should be viewed as systems and that all systems require management and control (Jacobs, 1990). Additionally, Systems theory captures the complex and dynamic interactions of environments, organizations, work processes, and individual variables operating at any point in time and over time (Swanson, 2001). Psychological theory captures the core human aspects of developing human resources as well as the socio-technical interplay of humans and systems (Swanson, 2001). Economic theory, such as human capital theory, captures the core issues of the efficient and effective utilization of resources to meet productive goals in a competitive environment (Jacobs, 1990; Swanson, 2001).
Because of its interdisciplinary nature, HRD can be viewed from several different perspectives (Jacobs, 1990). Some researchers (Barrie & Pace, 1998; Chalofsky, 1989) have identified adult learning in the workplace as the core discipline of HRD. From another perspective, Jacobs (1988) has suggested that systems theory provides the most logical underlying structure for HRD. Furthermore, Nafukho, Hairston, and Brooks (2004) proposed that human capital theory can help the field of HRD define research agendas by viewing people as the most valuable assets.

**Definitions of Human Resource Development**

Differences in perspective also lead to different definitions of HRD (Jacobs, 1990). HRD researchers have proposed various definitions of HRD, suggesting their own perspective. The continued debate on the definitions of HRD can be captured by two major perspectives: 1) context-bound versus context-independent, and 2) learning versus performance.

**Context-bound versus context-independent.** There are different perspectives on defining HRD in terms of context. Some researchers argue that the definition of HRD can be varied based on context, whereas others argue that the definition of HRD should be applicable in all contexts. The context-bound perspective, proposed by McLean and McLean (2001) and McLean (2004), presented that context should be taken into consideration when defining HRD. McLean and McLean (2001) suggested that definitions of HRD should be considered from the global context, as the majority of efforts to define HRD have come from North America. Since the definition of HRD varies from one country to another, the definition must include the various national
contexts in which HRD is practiced. From this perspective, McLean and McLean (2001) proposed a global definition of HRD and defined HRD as “any process or activity that, either initially or over the long term, has the potential to develop adults’ work-based knowledge, expertise, productivity, and satisfaction, whether for personal or group/team gain, or for the benefit of an organization, community, nation, or, ultimately the whole of humanity” (p. 322). Furthermore, McLean (2004) proposed the notion of National HRD (NHRD). He argued that some countries have recognized the links between developing human resources and national productivity and performance, which is also reflected in the definitions of HRD.

Swanson (2007) critiqued the context-bound perspective, arguing that due to the size and complexity of HRD’s host system, a host system may be too diverse to base the definition of HRD on it. For instance, even though Singapore and the USA are both nations, the characteristics of these nations are clearly different; Singapore is an authoritarian island nation and can effectively manage Singapore HRD, whereas the USA is too big to unify its policy system. In this way, Swanson (2007) offered a different viewpoint toward national HRD, and argued that a clear and concise definition of HRD which works everywhere is needed.

Learning versus performance. In defining HRD, there has been a debate on learning versus performance. Some HRD researchers (Jacobs, 1988, 2006; Holton, 2002; Swanson, 1995; Swanson & Holton, 2001) believed that the primary purpose of HRD is performance improvement. The performance can be targeted to the levels of the individual, work-process, and organization (Rummler & Brache, 1995). The performance paradigm of HRD mainly focuses on improvement of performance, but it appears to
consider learning as intervention for improving performance (Holton, 2002). For example, Jacobs (1988) presented the notion of human performance technology focused on performance by linking it with systems theory, defining human performance technology as “the development of human performance systems, and the management of that development, using a systems approach to achieve organizational and individual goals” (p. 8). Jacobs (2006) further defined HRD as “the process of improving organizational performance and individual learning through the human accomplishments that result from employee development, organization development, and career development programs” (p. 21). Similarly, Swanson and Holton (2001) defined HRD as “a process for developing and unleashing human expertise through organization development and personnel training and development for the purpose of improving performance” (p. 4).

In contrast, other researchers (Barrie & Pace, 1998; Bierema, 1997; Dirkx, 1997; Watkins & Marsick, 1995) believe that individual development and growth through learning enhances organizational effectiveness, primarily emphasizing individual learning as an outcome. For example, Watkins and Marsick (1995) defined HRD as “the field of the study and practice responsible for the fostering of a long-term work-related learning capacity at the individual, group, and organizational level of organizations” (p. 2). In addition, Barrie and Pace (1998) argued that an educational approach to HRD should be emphasized with an organizational learning approach.

In this debate, the performance paradigm of HRD seems to be criticized by researchers who have a learning perspective on HRD (Swanson & Holton, 2001). That is, the learning paradigm appears to be viewed as inherently good, while the performance paradigm is viewed as bad (Holton, 2002). For instance, Barrie and Pace (1998) asserted
that improvements in performance are usually achieved through behavioral control and conditioning. In a similar vein, Bierema (1997) provided a critique about the performance paradigm, arguing that the performance approach is mechanistic.

The argument about ‘learning’ versus ‘performance’ is derived from the perspective on the outcomes of learning. The performance paradigm views the primary outcome of HRD as not just learning, but learning and performance (Holton, 2002), while the learning paradigm highly focuses on individual learning per se, as outcome. In the learning paradigm, the primary purpose of HRD is the development of the individual, suggesting that the needs of the individual for learning and development should be more important than the needs of the organization (Holton, 2002). However, the performance paradigm expects that learning and growth will benefit the performance system in which it is embedded (Holton, 2002). Performance advocates maintain that focusing on individual development alone is likely to result in ineffective HRD. As such, learning is necessary, but not sufficient for improving job performance if it does not result in an expected level of competence or anticipated direction (Jacobs, 2006). Furthermore, for the learning advocates, Holton (2002) provided a critique by addressing that if the field of HRD focuses only on learning or individuals, then it is likely to end up being marginalized as a staff support group.

Such a debate extends the purpose of HRD to include both learning and performance. For example, “professional HRD activities should promote performance or learning” (Kuchinke, 2000, p. 32). Furthermore, as Swanson and Holton (2001) noted, some view learning and performance as alternatives or rivals, while most see them as partners in a formula for success.
Workplace Learning

This section is organized in three parts. The first part reviews the current understanding of definitions on workplace learning. The second part discusses two main streams of workplace learning, including formal learning and informal learning. The third part reviews the literature on measures of workplace learning.

Definitions of Workplace Learning

Workplace learning takes a variety of meanings and many forms. In addition, there are several terms that encompass work and learning: workplace learning, training, learning at work, learning in work, work-related work, and lifelong learning. Researchers have usually described workplace learning as key themes. Then, workplace learning can be viewed from different perspectives. Table 2.1 offers a selection of definitions and key themes of workplace learning that depict a range of approaches to the complex idea of workplace learning. Definitions and key themes have been selected to reflect the diversity of terms used by researchers who have different conceptual perspectives. They are organized according to the date of publication. There is no consensus on what is meant by workplace learning.

Indeed, different researchers have used the term ‘workplace learning’ to mean very different things. For example, Watkins and Marsick (1992) argued that there are different forms of workplace learning, such as formal, informal, and incidental. They especially paid attention to informal and incidental learning as opposed to traditional, formal learning. Formal learning (training) is made up of discrete planned events (experiences) used to instruct people how to perform specific defined jobs. It is usually
institutionally sponsored and is highly structured. Informal learning may occur in institutions, but is not usually classroom-based or highly structured; the control of the learning is in the hands of the learner, not determined by the organization. Watkins and Marsick (1992) also defined incidental learning as an unintended by-product of some other activity, such as trial-and-error experimentation or interpersonal interaction, arguing that informal and incidental learning are not necessarily the same.

In light of the learning form or type, Barnett (1999), Hodkinson and Hodkinson (2004), and Sambrook (2005) described workplace learning as both formal and informal learning. Barnett (1999) argued that work has to become learning and learning has to become work in order to cope with the age of supercomplexity. He also asserted that interrelationships between learning and work have to be worked out at different levels (organizational and personal) and in different modes (formal and informal). Hodkinson and Hodkinson (2004) constructed a matrix of learning types. They categorized learning based on intentional/planned and unintentional/unplanned aspects, along with three criteria: learning which is already known to others, development of existing capability, and learning which is new in the workplace (or treated as such). Then, they identified workplace learning as six types: planned learning of that, which others know, socialization into an existing community of practice, planned/intended learning to refine existing capability, unplanned improvement of ongoing practice, planned/intended learning to do that which has not been done before, and unplanned learning of something not previously done.

Sambrook (2005) defined work-related learning as ‘learning at work’ and ‘learning in work.’ Learning at work, as Sambrook argued, is associated with more
formal provision of education and training courses such as induction, mandatory health and safety, and a range of accredited and non-accredited in-house courses. Learning in work is associated with more informal processes embedded in work activities, such as observing, asking questions, problem-solving, project work, coaching, and being part of multi-disciplinary teams. Moreover, Sambrook (2005) identified work-related learning and learning ‘outside’ work, arguing that there are many opportunities for learning with a work focus provided outside the workplace. These include work focus learning opportunities such as academic programs (undergraduate vocational degrees, postgraduate masters and MBAs), work-based learning, professional programs, technical apprenticeships, and National Vocational Qualifications (NVQs)\(^1\) as well as non-work focus learning opportunities such as learning through leisure and domestic activities that can be transferred to the work context. Similarly, Clarke (2005) identified workplace learning as formal learning, independent on-the-job learning, and group on-the-job learning.

A different perspective defines workplace learning as formal learning, structured learning, and goal-directed activities of the workplace. Billett (2001) argued that the common labeling of workplaces as ‘informal’ learning environments reveals ambiguous status in terms of learning. Billett insisted that work practices are not informal or unstructured, incidental or ad hoc; rather, they are structured by the requirements of work practice. Mocker and Spear (1982) presented a lifelong learning model to clarify the concept of lifelong learning. They provided the concept of control on the objectives (what is to be learned) and the means (how it is to be learned) when the decision is made about

\(^1\) In the UK, National Vocational Qualifications were introduced to recognize and accredit competence developed through experience and practice in work environments (Evans & Rainbird, 2002).
classifying the various types of lifelong learning. That is, an operational definition of lifelong learning should be based on the learner’s “locus of control” for making decisions about the goals and means of learning. Then, Mocker and Spear (1982) suggested the model, which is composed of a two-by-two matrix of learner and institution. This model represents four types of learning: formal learning (learners have little control over the objectives or means of learning), non-formal learning (learners control the objectives but not the means of learning), informal learning (learners control the means but not the objectives of learning), and self-directed learning (learners control both the objectives and means of learning).

Colley, Hodkinson, and Malcom (2003) presented an alternative lens to see the learning through its formal and informal attributes. Through their literature review, they found that learning has been classified into formal, informal, or non-formal. They pointed out, however, these are not discrete categories, and can lead to a misunderstanding of the nature of learning. Furthermore, they suggested the advantages of understanding in/formality in learning, compared with viewing informal and formal learning as distinct types. This way of understanding has the following advantages: it avoids misleading claims that either formal or informal learning is inherently superior to the other; and it makes it easier to analyze learning in diverse situations, to recognize changes in learning circumstances, and to facilitate analysis of the benefits and costs of such changes. Throughout their study, Colley, Hodkinson, and Malcom (2003) argued that it is more accurate to conceive ‘formality’ and ‘informality’ as attributes or characteristics present in all circumstances of learning. They also identified four aspects of learning to group these attributes: location and setting, process, purposes, and content. In addition, they
maintained that attributes of in/formality are interrelated differently in different learning situations. That is, those attributes and their interrelationships influence the nature and effectiveness of learning; and changing the balance between formal and informal attributes changes the nature of the learning.

Recently, Jacobs and Park (2009) proposed a conceptual framework of workplace learning that is comprised of the interaction of three variables: 1) the location of the learning, 2) the extent of planning that has been invested in developing and delivering the learning experiences, and 3) the role of the trainer, facilitator, or others during the learning process. They argued the need for the proposed framework based on two concerns. First, formal training and informal learning represent incompatible levels of discourse, making it difficult to have a cohesive understanding of workplace learning. Second, definitions of workplace learning appear to exclude a large segment of HRD practice, particularly when formal training programs occur in the work setting.
<table>
<thead>
<tr>
<th>Author</th>
<th>Date</th>
<th>Definition</th>
<th>Key Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watkins and Marsick</td>
<td>1992</td>
<td>Workplace learning defined by formal, informal, and incidental learning</td>
<td>- Formal learning (training): discrete planned events</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Informal learning: not usually classroom-based or highly structured</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Incidental learning: an unintended by-product of some other activity</td>
</tr>
<tr>
<td>Barnett</td>
<td>1999</td>
<td>Learning is inherent in work, and work is inherent in learning.</td>
<td>The interrelationships between learning and work have to be worked out at different levels (organizational and personal) and in different modes (formal and informal).</td>
</tr>
<tr>
<td>Boud and Garrick</td>
<td>1999</td>
<td>The purposes of workplace learning are presented rather than a precise definition of the concept.</td>
<td>- Improving performance for the benefit of the organization</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Improving learning for the benefit of the learner</td>
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<td></td>
<td></td>
<td></td>
<td>- Improving learning as a social investment</td>
</tr>
<tr>
<td>Billett</td>
<td>2001</td>
<td>Work practices serve to structure activities and guide in ways that influence the learning of the knowledge required for performance at work. These experiences are not informal or unstructured, incidental or ad hoc; rather, they are structured by the requirements of work practice.</td>
<td>- Formal learning</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Structured learning</td>
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<td></td>
<td></td>
<td></td>
<td>- Goal-directed activity of the workplace</td>
</tr>
</tbody>
</table>

Table 2.1: Definitions and key themes of workplace learning
Table 2.1 Continued

<table>
<thead>
<tr>
<th>Source</th>
<th>Year</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
</table>
| Evans and Rainbird | 2002 | Workplace learning includes a range of formal and informal learning; learning which is directed to organizational as well as employees’ needs; and learning which is accessed through the workplace | - Initial work-based learning, in traineeships and apprenticeships for young people  
- Work-based degrees and foundation degrees (higher education such as associate degree)  
- Non-formal work-based learning (National Vocational Qualification, learning through work and community experience)  
- Access to continuing non-formal learning opportunities through the workplace (online learning) |
| Colley, Hodkinson, and Malcom | 2003 | Workplace learning can be classified as being formal, informal, or non-formal, suggesting that it may be better to conceive formality and informality as attributes or characteristics in all learning situations. | - Formal learning  
- Informal learning  
- Non-formal learning |
| Hodkinson and Hodkinson | 2004 | Workplace learning is sufficiently diverse and complex, so that no one theory, at least none yet fully developed, can adequately deal with all its aspects. Within this complexity, only some types of workplace learning are susceptible to the clear identification of workplace learning. | - Planned learning of that, which others know  
- Socialization into an existing community of practice  
- Planned/intended learning to refine existing capability  
- Unplanned improvement of ongoing practice  
- Planned/intended learning to do that, which has not been done before  
- Unplanned learning of something not previously done |
Table 2.1 Continued

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
</table>
| Clarke           | 2005 | Workplace learning is formal, planned learning off the job, independent on-the-job learning, and group on-the-job learning. | • Formal, planned learning off the job  
• Independent on-the-job learning  
• Group on-the-job learning          |
| Sambrook         | 2005 | Work-related learning encompasses learning at work (the more formal provision of education and training courses) and learning in work (the more informal processes embedded in work activities). | • Formal provision of education and training courses  
• Informal processes embedded in work activities |
| Elkjaer and Wahlgren | 2006 | The workplace is seen as providing opportunities for informal and incidental learning as well as a combination of these with more formal teaching and guiding activities. | • Informal learning  
• Incidental learning  
• More formal learning |
| Jacobs and Park  | 2009 | Workplace learning is the process used by individuals when engaged in training programs, education and development courses, or some type of experiential learning activity for the purpose of acquiring the competence necessary to meet current and future work requirements. | • Location of learning (off the job/on the job)  
• Degree of planning (unstructured/structured)  
• Role of others during the learning (passive/active) |

**Formal Learning and Informal Learning**

Workplace learning takes a variety of definitions and many forms since workplace learning is neither a unified nor clearly defined concept (Antonacopoulou et al., 2006; McCormack, B., 2000). Many researchers (Barnett, 1999; Boud & Garrick,
1999; Billet, 2001; Clarke, 2005; Sambrook, 2005; Watkins & Marsick, 1992) have offered their perspectives on the type of learning that occurs at work. For example, as discussed above, Watkins and Marsick (1992) presented that there are different forms of workplace learning, such as formal, informal, and incidental. They especially paid attention to informal and incidental learning relative to formal learning. They defined formal learning such as training as discrete planned events (experiences) to instruct people how to perform specific defined jobs. It is usually institutionally sponsored and is highly structured. Informal learning may occur in institutions, but is not usually classroom-based or highly structured. In addition, the control of the learning is in the hands of the learner, not determined by the organization. Watkins and Marsick (1992) referred to incidental learning as an unintended by-product of some other activity, such as trial-and-error experimentation or interpersonal interaction. They further argued that informal and incidental learning look similar but they are not necessarily the same.

Other researchers (Barnett, 1999; Enos, Kehrhahn, & Bell, 2003; Hodkinson & Hodkinson, 2004; Sambrook, 2005) categorized workplace learning as formal and informal learning. Workplace learning can be further classified as formal and planned learning off the job, independent on-the-job learning, and group on-the-job learning (Clarke, 2005). As such, various perspectives on workplace learning have been suggested, but two forms of learning can be highlighted: formal learning and informal learning. In this section, formal learning and informal learning as main streams of workplace learning are discussed.

*Formal Learning.* Traditionally, individual development through formal learning or training has focused primarily on processes and interventions necessary to
Formal learning opportunities are recognized as traditional classroom instruction. Mocker and Spear (1982) also addressed that formal learning is related to school education and most degree programs as well as certificate programs that colleges and universities offer. Formal learning and training is a frequently utilized approach in the workplace. For example, the research conducted in Malaysia, which sampled 3,000 adults, revealed that formal learning rather than informal learning was the dominant approach (Muhamad & Idris, 2005).

Formal learning is recognized as a planned learning approach, such as traditional classroom instruction (Mocker & Spear, 1982). It is a frequently utilized approach in the workplace. Although training as a kind of formal learning has been used pervasively in the workplace learning methods, critiques have been made regarding training. Clarke (2006) stated that training focuses on narrow skill-based learning relevant to an employee performing his/her current job, so that learning for application needed in today’s workplace seems to be difficult to achieve through training. Enos, Kehrhahn, and Bell (2003) further provided similar critiques on training, arguing that formal training does not help managers to keep pace with the constant change that occurs in today’s workplace and does not provide managers with sufficient real-world experience to develop proficiency.

Informal Learning. Informal learning refers to the learning that takes place mainly through social interactions and relationship with people in the workplace (Rowden, 2007). Informal learning is described as learning through informal relationships, such as an immediate contact, often unplanned, as part of participation in a practice (Blaaka & Filstad, 2005). Lohman (2005) defined informal learning as
“an aspect of workplace learning that specifically involves those learning activities that employees initiate in the workplace, involve the expenditure of physical cognitive, or emotional effort, and result in the development of professional knowledge and skills” (p. 502). Similarly, Garavan et al. (2002) defined workplace learning as “a set of processes which occur within specific organizational contexts and focus on acquiring and assimilating an integrated cluster of knowledge, skills, values and feeling that result in individuals and teams refocusing and fundamentally changing their behavior” (p. 61). Both definitions of workplace learning are understood as context-based.

The types of informal learning may be planned or unplanned, structured or unstructured (Lohman, 2005). Similarly, Doornbos, Simons, and Denessen (2008) stated that employee learning may be spontaneous (unintended, unplanned) or deliberate (planned and sought by the worker), arguing that employees consciously or unconsciously engage in learning activities for the purpose of acquiring knowledge, skills, or new attitudes. For this study, as stated above, informal learning focuses on intentional and planned learning. In this vein, it refers to intentional interactions with others as social aspects of learning in the workplace (Enos, Kehrhahn, & Bell, 2003; Koopmans, Doornbos, & Van Eekelen, 2006).

Enos, Kehrhahn, and Bell (2003) and Koopmans, Doornbos, and Van Eekelen (2006) argued that informal learning is intentional and planned learning activities through interactions with others as social aspects of learning within the workplace. Examples of informal learning include talking and sharing resources with others, on-the-job training, networking, coaching, and mentoring (Leslie, Aring, & Brand, 1998; Lohman, 2005; Rowden, 2007). Informal workplace learning activities can include talking with others,
collaborating, observing others, sharing materials and resources with others, searching the Internet, scanning professional magazines and journals, trial and error, reflecting on one’s actions, and so forth (Lohman, 2005). Informal learning includes mechanisms such as mentoring, coaching, job rotation, job-shadowing, and special projects or assignments (Marsick & Watkins, 1997). Furthermore, Leslie, Aring, and Brand (1997) found that the majority of informal learning in the workplace occurs in the course of social and individual work activities; employees can learn from interacting, sharing their ideas and resources, and performing their jobs. As such, informal learning emphasizes learning through social interactions and relationships with others.

Additionally, several researchers (e.g., Enos, Kehrhahn, & Bell, 2003; Leslie, Aring, & Brand, 1997) have addressed that informal learning is conducive to employee or organizational performance, even if empirical studies, which has investigated those relationships, are rare.

Enos, Kehrhahn, & Bell (2003) believed that proficiency, which is a manager’s ability to apply knowledge skillfully, can be mostly developed through informal learning activities by action and reflection rather than formal learning usually focused on the acquisition of knowledge. Then, they examined the relationships among formal training, informal learning, managerial proficiency, transfer climate, and transfer of learning among corporate managers. The research findings showed that managers with high levels of proficiency who experienced low levels of coworker, supervisor, and organizational support learn managerial skills generally from informal learning (Enos, Kehrhahn, & Bell, 2003). In a similar vein, Leslie, Aring, and Brand (1997) argued that informal learning generally occurs for the purpose of achieving organizational and individual goals. They
also emphasized the contribution of informal learning to organizational success, maintaining that informal learning does not take place for its own sake.

**Workplace Learning in Human Resource Development**

To date, HRD has focused mainly on planned and systematically designed approach. Moreover, it usually occurs away from organizations in which employees are working. Arguably, training has narrowed the various learning activities in the workplace, so that employees may miss out on other important learning programs. For example, structured on-the-job training (S-OJT) is a prominent learning method, which takes place in the workplace with planned methods. If training is solely emphasized as the learning approach for employees, it is difficult to find a category to place S-OJT.

Additionally, the extreme perspectives on performance versus learning are no more meaningful because they can interact to achieve the goals of organizational performance and individual learning. As Kuchinke (1998) argued, the dualism between learning and performance is not necessary. Likewise, Swanson and Holton (2001) noted that some view learning and performance as rivals, but most see them as partners. Learning and performance should not be separated; rather, they need to be joined (Holton, 2002). The performance improvement of employees and organizations can result from effective learning. At the same time, learning needs to result in expected performance as long as it is funded by the organization. In this way, learning and performance are not rivals but partners; performance can be achieved through effective individual learning, and in turn individual learning can lead to performance.
Typically, training has been regarded as the most predominant method for enhancing the productivity of individuals and organizations. However, a more balanced perspective is needed by including informal learning in workplace learning, along with formal learning. As Leslie et al. (1997) noted, many skills can be enhanced through informal activities rather than in formal settings, especially when properly supported. In this sense, consideration of both formal and informal types of learning activities is critical to reflect how employees really learn to gain new knowledge and skills in the workplace.

Thus, the current study suggests that the term ‘training’ used in the literature needs to be replaced with the term ‘workplace learning.’ Workplace learning embraces both training and learning, as well as both individual/organizational/performance and individual learning. It would be more reasonable to use the term ‘workplace learning’ rather than ‘training,’ as it would reflect the diverse learning approaches. Therefore, the concept of workplace learning is believed to contribute to HRD by expanding and deepening the research as well as practice in the HRD field.

Outcomes of Workplace Learning

While research investigating the predictors of engagement or participation in workplace learning has been predominant, there have been relatively few studies examining outcomes of workplace learning. Indeed, a variety of research in workplace learning has focused on examining contextual inhibitors or facilitators of workplace learning (Lohman, 2005; Ellinger, 2005; Sambrook, 2005; Sambrook & Stewart, 2000) or investigating the factors that influence employees’ engagement in learning activities (Birdi, Allan, & Warr, 1997; Doornbos, Simons, & Denessen, 2008; Maurer & Tarulli,

Most studies examining outcomes of workplace learning have paid attention to employees’ perceived satisfaction, learning, and commitment (Ahmad & Bakar, 2003; Al-Emadi & Marquardt, 2007; Bartlett, 2001; Bartlett & Kang, 2004; Rowden, 2002; Rowden & Ahmad, 2000; Sahinidis & Bouris, 2008). Research suggests that the better perceptions employees have of their workplace learning, the better organizational commitment or job satisfaction they will have. For instance, Bartlett (2001) found that perceived access to training, social support for training, motivation to learn, and perceived benefits of training were positively related to organizational commitment, especially the affective type of commitment. Furthermore, Slattery, Selvarajan, and Anderson (2006) found a positive relationship between new employee development practices and organizational commitment.

The next section discusses outcomes of workplace learning in detail. It is organized in two parts. The first part reviews theoretical foundation on outcomes of workplace learning. The second part discusses theoretical models regarding outcomes of workplace learning.

*Theoretical Foundation on Outcomes of Workplace Learning*

There is little theoretical attention to and research on how employees’ workplace learning is related to organizational outcomes in the HRD field. However, theoretical foundation in the strategic human resource management (SHRM) research (e.g., Wright & McMahan, 1992) helps to understand workplace learning and its outcomes. Wright and
McMahan (1992) proposed a conceptual framework which showed the dynamic relationships of workplace learning and its outcomes with HRM practices. Their framework presented that HRM practices influence the HR capital pool (skills and abilities), and HR behaviors then result in firm-level outcomes (performance, satisfaction, absenteeism, etc.).

According to Wright and McMahan (1992), six theoretical underpinnings of HR practices based on organizational theory, economics, and finance can be identified: “(1) resource-based view of the firm, (2) behavioral perspective, (3) cybernetic models, (4) agency/transaction cost theory, (5) resource dependence/power models, and (6) institutional theory” (p. 295). Among these theoretical frameworks, the resource-based view of the firm, the behavioral perspective, cybernetic systems, and agency/transaction cost theory assume that an organization’s proactive and strategic decision making perspective influences its HR activities. In contrast, resource dependence/power models and institutionalism are based on the belief that HR practices result from not rational strategic decision making processes, but institutional and political forces in the organization.

Given the performance-oriented learning perspective, which emphasizes organizational strategic efforts of workplace learning for organizational success (Holton, 2002; Jacobs, 2006; Swanson & Holton, 2001), three of the above-listed theories seem to be appropriate for explaining workplace learning and its outcomes: (1) resource-based view, (2) the behavioral perspective, and (3) cybernetic systems model. These theories are based on the viewpoint that workplace learning activities are determined by the intended and planned approach.
The Resource-based View. First, the resource-based view of the firm (Barney, 1991, 2001; Peteraf, 1993; Wernerfelt, 1984) seeks to explain the conditions in which a firm may gain a sustained competitive advantage. Barney (1991) argued that a firm has the potential to generate sustained competitive advantage from its resources that are valuable, rare, inimitable, and non-substitutable. The main theoretical insight of the resource-based view is that the differences in resources across firms (even within the same industry) can be a source of a sustainable competitive advantage (Barney, 1991; Wernerfelt, 1984). These resources can be tangible and intangible assets, such as a firm’s management skills, its organizational processes and routines, and the information and knowledge under its control (Barney, Wright, & Ketchen, 2001). The resource-based view implies that investing in employee competence through workplace learning can be an important source of sustained competitive advantage for generating superior firm performance.

The Behavioral Perspective. Second, the behavioral perspective focuses on employee behavior as a mediator between strategy and firm performance. The basic assumption of this perspective is that strategies should lead to human resource practices which can strengthen employee behaviors required by organizations and can in turn result in beneficial organizational outcomes. Moreover, this behavioral model posits that if the organizational strategy is different, it will consequently lead to a different organizational performance. The model also hypothesizes that human resource practices and employee behaviors can either mediate or moderate in the relationship between organizational strategies and organizational performance (Wright & McMahan, 1992). The behavioral
perspective further suggests that workplace learning will result in organizational benefits as long as the organization's strategy leads to required employee behaviors.

*The Cybernetic Systems Model.* The third theoretical anchor is the cybernetic systems models or the input–throughput–output model. The cybernetic model of the human resource system consists of input, throughput, and output or outcome: (1) input in this model includes human resources, knowledge, skills, and abilities; (2) throughput, which is transformation of input, refers to human resource behaviors; and (3) output, which results from input and throughput phases, can be productivity, satisfaction, or turnover (Wright & McMahan, 1992). This cybernetic systems model suggests that workplace learning results in employee competence, such as knowledge, skills, and abilities (input); and employee competence leads to employee behavior (throughput), which subsequently influences employee-, as well as organizational outcomes (output).

**Theoretical Models for Workplace Learning Outcomes**

In addition to the theoretical foundation of workplace learning and its outcomes, several theoretical models have been identified regarding outcomes of workplace learning. The models of workplace learning outcomes can be largely divided into: (1) workplace learning evaluation models, which emphasize the evaluation levels of workplace learning, and (2) models linking workplace learning and organizational performance, which concentrate on the categories of workplace learning outcomes and related indicators in each category.

*Workplace Learning/Training Evaluation Models.* Several models that usually focus on training have been proposed regarding training evaluation. One of the most
well-known evaluation models is Kirkpatrick’s (1996) four-level framework. Kirkpatrick described these four levels in his model: (1) reaction (learner’s feeling about program or instruction, measured by the use of reaction questionnaires); (2) learning (attitudinal, cognitive, and behavioral learning, measured by performance test during training); (3) behavior (on-the-job performance after training, assessed by the extent to which learners apply what they learned in training programs on the job after training); and (4) results (organizational benefits, measured by costs, quality and return on investment (ROI). In this model, each level is associated with the others. That is, reactions to training are related to learning, learning is related to behavior, and behavior is related to results. Kirkpatrick’s (1996) model has been widely used in evaluation practice and research.

Kaufman and Keller (1994) developed Kirkpatrick’s model further by adding the societal level as an evaluation criterion. They asserted that the model needed to include how various types of development events are evaluated, indicating that Kirkpatrick’s model was limited because it was only proper for training evaluation. Holton (1996) suggested another evaluation model. His model excluded ‘reaction,’ which was in Kirkpatrick’s model because reactions are not considered a primary outcome of training. Consequently, Holton’s model is composed of three parts: learning, transfer, and results. Reaction was not contained in the model, but reactions are hypothesized as playing a role between trainees’ motivation to learn and the learning that actually takes place. Consistent with Kirkpatrick’s model, Holton’s model assumes that learning is related to transfer and transfer is related to results.

Kraiger (2002) provided an evaluation model with three areas for evaluation: (1) training content and design in terms of design, delivery, and validity of training, (2)
changes in learners from affective, cognitive, and behavioral perspectives, and (3) organizational payoffs such as transfer climate, job performance, and results. Reactions were included as a part of assessing training content and design, but Kraiger’s evaluation model had different assumptions compared to previous models. Kraiger argued that reactions are not related to changes in learners or organizational payoffs, but the changes in learners are related to organizational payoffs.

More recently, Alvarez, Salas, and Garofano (2004) proposed an integrated model of training evaluation and effectiveness (IMTEE) by adding training effectiveness components to the evaluation model. They differentiated training evaluation from training effectiveness as follows: “training evaluation refers to the measurement of a training program’s success or failure with regard to content and design, changes in learners, and organizational payoffs” (p. 388), whereas “training effectiveness means that the study of the individual, training, and organizational characteristics that influence the training process before, during, and after training” (p. 389).

The IMTEE has four levels: (1) needs analysis, (2) training content and design, (3) changes in learners, and (4) organizational payoffs. In this model, needs analysis is related to training content and design, changes in learners, and organizational payoffs. The IMTEE posits that changes in learners can be assessed by measuring post-training attitudes, cognitive learning, and training performance. Finally, organizational payoffs can be evaluated by measuring transfer performance and results. The significance of the IMTEE is to comprehensively incorporate training effectiveness variables (individual characteristics, training characteristic, and organizational characteristics), along with measures of training evaluation. Training effectiveness variables are hypothesized as
being related to training evaluation measures: individual characteristics are related to reactions; individual and training characteristics are assumed to be related to all three measures of changes in learners; and individual, training, and organizational characteristics are related to transfer performance.

*Models Linking Workplace Learning and Organizational Outcomes.* Theoretical models portraying the relationship between workplace learning and organizational performance can be found in the literature on strategic human resource management (SHRM). As shown in Table 2.2, the theoretical models reviewed (Becker, Huselid, Pickus, & Spratt, 1997; Dyer & Reeves, 1995; García, 2005; Guest, 1997; Ostroff & Bowen, 2000; Tharenou, Saks, & Moore, 2007) suggest that workplace learning outcomes or human resource practices outcomes can be mainly categorized into three types: (1) workplace learning outcomes human resource outcomes, such as employees' satisfaction, commitment, motivation, behavior and skills, and individual or group performance; (2) organizational performance outcomes such as productivity, quality, innovation, absence, turnover, conflict, and quality and service; and (3) organizational financial outcomes such as profits, return on investment (ROI), return on assets (ROA), return on equity (ROE), and market value or stock-market performance (e.g., stock value or shareholder return) for publicly held firms.

With respect to workplace learning outcomes, research findings support the notion that workplace learning programs can influence organizational commitment and job satisfaction. Lee and Bruvold (2003) demonstrated that investing and planning development activities for nurses can promote and develop their organizational commitment and job satisfaction in healthcare organizations. Similarly, employee
satisfaction, client satisfaction, and owner/shareholder satisfaction had a significantly positive correlation with training in Spanish firms (García, 2005). Rowden (2002) and Rowden and Ahmad (2000) further showed evidence that workplace learning including formal, informal, and incidental learning is found to be positively associated with employees’ job satisfaction. Moreover, Pate, Martin, Beaumont, and McGoldrick (2000) found that an organization’s investment in training paid off in terms of positive outcomes of psychological contracts, such as organizational commitment and job satisfaction, as well as knowledge transfer in the workplace.

Organizational performance outcomes are related less to the financial, rather than the non-financial aspect of performance. They include indicators of productivity, quality, innovation, absence, turnover, conflict, and quality and service. In contrast, organizational financial outcomes, such as profits, return on investment (ROI), return on assets (ROA), return on equity (ROE), and stock-market performance (e.g., stock value or shareholder return) for publicly held firms, are focused on the economic profitability of firms. The relationship between workplace learning and organizational performance outcomes as well as financial performance will be discussed in the next section in detail.

The underlying premise of the theoretical models is that there is a linear relationship between workplace learning and its outcomes. The influences of workplace learning on organizational financial outcomes are mediated through direct effects of workplace learning on employee attitudes (e.g., satisfaction and commitment), behaviors, and employee competence (e.g., knowledge and skills). That is, workplace learning activities as a type of human resource practices may influence workplace learning outcomes or human resource outcomes, such as employees’ satisfaction, commitment,
motivation, and behavior and skills. These workplace learning outcomes or human resource outcomes are assumed to lead to organizational performance outcomes (e.g., productivity, quality, innovation, absence, turnover, conflict), which in turn result in firm profits. Thus, workplace learning outcomes such as employees' attitudes, behaviors, and competence should influence organizational performance (Ostroff & Bowen, 2000). In turn, organizational performance should lead to positive financial outcomes for the organization (Becker & Huselid, 1998; Dyer & Reeves, 1995).
<table>
<thead>
<tr>
<th>Author</th>
<th>Workplace Learning / HR Practices</th>
<th>Workplace Learning Outcomes / HR Outcomes</th>
<th>Organizational Performance Outcomes</th>
<th>Organizational Financial Outcomes</th>
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<tr>
<td>Dyer &amp; Reeves (1995)</td>
<td>- Human resource practices</td>
<td>- Absenteeism • Turnover • Individual or group Performance</td>
<td>- Productivity • Quality and service</td>
<td>- Return on invested capital • Return on assets • Stock-market value for publicly held firms (stock value or shareholder return)</td>
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<tr>
<td>Becker, Huselid, Pickus, &amp; Spratt (1997)</td>
<td>- Design of human resource management system</td>
<td>- Employee skills • Employee motivation • Job design • Work structures</td>
<td>- Productivity • Creativity • Discretionary effort</td>
<td>- Profits and growth → Market value</td>
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<tr>
<td>Guest (1997)</td>
<td>- Training • Selection • Appraisal • Rewards • Job design • Involvement • Status and Security</td>
<td>- Commitment • Quality • Flexibility</td>
<td>- Productivity (High) • Quality (High) • Innovation (High) • Absence (Low) • Labor turnover (Low) • Conflict (Low) • Customer complaints (Low) • Labor turnover (Low)</td>
<td>- Profits • ROI (Return on Investment)</td>
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Table 2.2: Theoretical models linking workplace learning and organizational outcomes
Table 2.2 Continued

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<td>• Satisfaction</td>
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<td>• Behavior and skills</td>
<td>• Firms performance</td>
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<td>García (2005)</td>
<td>• Training</td>
<td>• Satisfaction</td>
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<td>• Social climate</td>
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<td>Tharenou, Saks, &amp; Moore (2007)</td>
<td>• Training</td>
<td>• Attitude</td>
<td>• Motivation</td>
<td>• Behaviors</td>
<td>• Human capital</td>
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<td>• Profit and financial indicators ( return on investment (ROI), return on assets (ROA), return on equity (ROE))</td>
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Table 2.2: Theoretical models linking workplace learning and organizational outcomes
Workplace Learning and Organizational Performance

This section consists of three parts. The first part discusses how to classify domains of organizational performance, along with measurement issues of organizational performance. Next, various perspectives on the relationship between workplace learning and organizational performance are reviewed. The third part discusses the relationship between workplace learning and organizational performance based on the review of previous empirical research.

Conceptualization and Measurement of Organizational Performance

Before reviewing the relationship between workplace learning and organizational performance, discussions of how to classify organizational performance and how to measure organizational performance are needed. To attempt to assess organizational outcomes, what constitutes organizational performance should be identified. Regarding the conceptualization of organizational performance, several researchers (Davis & Pett, 2002; Ford & Schellenberg, 1982; Hubbard, 2009; Ostroff & Schmitt, 1993; Venkatraman & Ramanujam, 1986) have suggested their perspectives on the classification of organizational performance, but there is little consensus about this issue.

For example, Hubbard (2009) proposed the Sustainable Balanced Scorecard (SBSC) conceptual framework for an appropriate measure of organizational performance. SBSC includes social and environmental issues in the existing Balanced Scorecard (BSC) by integrating the Triple Bottom Line. In the SBSC framework, the Triple Bottom Line refers to a broader perspective of the stakeholders, and the BSC performance
measurement incorporates financial, customer/market, short-term efficiency, and long-term learning and development factors as internal processes of the performance measurement. As another instance, Ford and Schellenberg (1982) addressed that the assessment of organizational performance could be classified into behavioral consequences (e.g., turnover, satisfaction) or non-behavioral consequences (e.g., profit) or intended consequences (e.g., product quality) or unintended consequences (e.g., turnover).

While researchers seem to agree on using a number of different criteria to measure organizational performance, various viewpoints still exist in the conceptualization of organizational performance. Nevertheless, two perspectives for measuring organizational performance are mainly identified: (1) efficiency versus effectiveness, and (2) financial performance versus non-financial performance. The first perspective on organizational performance is that organizational effectiveness and organizational efficiency should be included to measure organizational performance. Efficiency generally refers to profits as the ratio of inputs to outputs, whereas effectiveness represents a firm’s capability to acquire scarce resources (Davis & Pett, 2002). In other words, efficiency is associated with profitability and effectiveness concerns growth.

Several researchers (Davis & Pett, 2002; Ford & Schellenberg, 1982; Ostroff & Schmitt, 1993) have advocated dimensions of both efficiency and effectiveness for measuring organizational performance. Ostroff and Schmitt (1993) used indicators of efficiency and effectiveness for assessing secondary school performance. In a similar vein, Ford and Schellenberg (1982) asserted that organizations can acquire higher return
when concepts of efficiency and effectiveness are concentrated. Furthermore, Davis and Pett (2002) proposed a typology of performance consisting of organizational efficiency and effectiveness and provided indicators of both dimensions. The measures of organizational efficiency include after-tax return on total sales (ROS) and return on total assets (ROA). ROA represents that revenue is compared to the assets of an organization at a given point as a static measure, whereas ROS is a comparison of the profits from a given year compared to the sales of that same year as a ratio. As for organizational effectiveness, the firm’s total sales growth and total employment growth are considered. Sales growth and employment growth are a static ratio because the sales growth of the current year can be compared with the sales that accumulated during the previous time period.

Another perspective on measuring organizational performance is financial performance versus non-financial performance. Regarding this viewpoint, the conceptual framework presented by Venkatraman and Ramanujam (1986) sheds light on the dimensions of performance in an organization. Venkatraman and Ramanujam (1986) argued that business performance consisted of financial performance and business performance, including both financial performance and non-financial performance. They included both financial performance and business performance in a broader domain of organizational effectiveness. In their conceptualization of organizational performance, they indicated financial performance as a narrower concept relative to business performance. Financial performance highlights the use of outcome-based financial indicators, so that it assumes that organization’s ultimate goal is to achieve economic benefits. Typical indicators for financial performance are sales growth, profitability
(ratios such as return on investment (ROI), return on sales (ROS), and return on equity (ROE)), earnings per share, and so on (Venkatraman & Ramanujam, 1986). Additionally, Tobin's Q, which refers to the ratio of the market value of a firm to the replacement cost of its assets (Lindberg & Ross, 1981), and return on assets (ROA) can be used as financial indicators to measure financial performance.

Other than financial performance, business performance is comprised of financial performance and operational performance. Because operational performance represents non-financial aspects of performance, the domain of operational performance encompasses both the financial and non-financial aspects. Operational performance includes market share, new product introduction, product quality, marketing effectiveness, manufacturing value-added, and other indicators of technological efficiency (Venkatraman & Ramanujam, 1986).

Based on the above discussion, business performance is regarded as the broadest concept of organizational performance because business performance includes both (1) financial performance and (2) non-financial performance as operational performance. Indicators of organizational efficiency such as after-tax return on total sales (ROS) and return on total assets (ROA) and organizational effectiveness such as sales growth are also included in the domain of financial performance (Venkatraman & Ramanujam, 1986). Therefore, following conceptualizing business performance provided by Venkatraman and Ramanujam (1986), combining both financial- and non-financial performance focused on operational performance can effectively measure organizational performance. At the same time, both dimensions of financial performance and non-financial performance are considered as encompassing profitability (efficiency) and
growth (effectiveness) discussed above (Davis & Pett, 2002).

Perspectives on Workplace Learning and Organizational Performance

In explaining the types of relationships between workplace learning and organizational performance, Delery and Doty (1996) considered three perspectives: (1) universalistic, (2) contingency, and (3) configurational. The universalistic perspective views workplace learning outcomes or human resource outcomes as mediating in the relationship between workplace learning and organizational performance. While the contingency perspective addresses that the relationship between workplace learning and organizational performance might be moderated by organizational factors such as firm strategy, the configurational perspective poses that the relationship might be moderated by other congruent workplace learning practices or human resource practices.

The Universalistic Perspective. The universalistic perspective provides the most fundamental relationship between workplace learning and organizational performance. The underlying logic of the universalistic perspective is that workplace learning as a human resource practice can result in positive organizational outcomes (Delery & Doty, 1996; Ostroff & Bowen, 2000). This perspective suggests that the more use of workplace learning an organization makes, the better able the organization will be to lead to organizational performance. Therefore, the universalistic perspective assumes that the large amount of investment that an organization makes in employee learning may be a potential predictor of successful organizational outcomes.

The Contingency Perspective. The relationship between workplace learning and organizational performance can also be explained by the contingency perspective. The
principle of the contingency perspective lies in the assumption that the relationship between workplace learning as HR practices and organizational performance depends on contextual factors such as the organization’s strategy (Delery & Doty, 1996). Thus, organizational outcomes resulting from employee learning will be different depending on the organizational strategy because the organization’s employee learning activities will be interacting with its strategies. Additionally, the contingency perspective suggests that as long as an organization’s employee learning activity or other HR practices fit well with its contextual factors including its strategies, the organization is more likely to have better performance because its strategies will be interacting with its employee learning activities or other HR practices.

The Configurational Perspective. The configurational perspective suggests that there are ideal types or configurations of human resource practices which lead to superior performance (Ostroff & Bowen, 2000). Configuration refers to unique patterns of human resource practices which are presumed to be maximally effective (Delery & Doty, 1996). While the configuration perspective supports a systems perspective by emphasizing the fit among the types of human resource practices, the contingency assertion focuses on certain individual human resource practices. Similarly, the universalistic perspective views certain individual human resource practices as better in all situations (Delery & Doty, 1996). Regarding the linkage between workplace learning and organizational performance, the configurational perspective implies that workplace learning will be effective for organizational outcomes only when it is congruently used with other human resource practices, such as performance management, promotion, and compensation systems.
Empirical Research Linking Workplace Learning and Organizational Performance

As noted above, there is fewer research investigating outcomes of workplace learning than studies examining antecedents of participation or engagement of workplace learning. Even among research focusing on the outcomes of workplace learning, few studies have investigated the relationship between workplace learning and organizational performance in the HRD field. A majority of studies linking workplace learning (e.g., training) and organizational performance have been found in the literature on strategic human resource management (SHRM).

The current study followed the theoretical models (Dyer & Reeves, 1995; García, 2005; Guest, 1997; Ostroff & Bowen, 2000; Tharenou, Saks, & Moore, 2007) and dimensions of financial performance and non-financial performance as operational performance (Faems, Sels, DeWinne, & Maes, 2005; Venkatraman & Ramanujam, 1986). This study reviewed empirical research in the linkage between workplace learning and organizational performance based on the following framework: (1) workplace learning, (2) workplace learning outcomes, (3) organizational performance outcomes, and (4) organizational financial outcomes.

Workplace learning refers to an array of learning activities in the workplace for supporting employee competence (Jacobs & Park, 2009). Workplace learning outcomes are related to direct effects of workplace learning, such as employees' satisfaction, commitment, motivation, and competence. Organizational level outcomes can be divided into organizational performance outcomes and organizational financial outcomes. In empirical research, Faems, Sels, DeWinne, and Maes (2005) focused on the effects of HR practices on operational performance (productivity and turnover) and financial
performance (profitability, liquidity, and solvency using ratios for the year in which the survey was held). Organizational performance outcomes refer to non-financial and operational outcomes, including productivity, quality, innovation, absence, turnover, conflict, and quality and service. Organizational financial outcomes are profit-focused results, such as profits, return on investment (ROI), return on assets (ROA), return on equity (ROE), return on sales (ROS), and stock-market performance. Based on these criteria, the current study reviewed previous empirical research for the linkage between workplace learning and organizational performance.

As shown in Table 2.3, training is found to be the most frequently used type of workplace learning. Several researchers (Aragón-Sánchez, 2003; García, 2005; Russell, Terborg, & Powers, 1985) have investigated the influence of training on organizational outcomes, whereas others (D’Arcimoles, 1997; Delery & Doty, 1996; Faems, Sels, DeWinne, & Maes, 2005; Vlachos, 2008; Delaney & Huselid, 1996; Paul & Anantharaman, 2003) have examined the influences of human resource practices on organizational performance. Rather than the individual human resource practice perspective, the latter approach views workplace learning focused on training from the human resource system perspective. This perspective seems to emphasize the inclusion of various human resource practices (workplace learning, compensation, performance management, and selection) because they believe that, when research seeks to examine the linkage with organizational outcomes, a single practice among the human resource systems would be interacting with each other (Faems, Sels, DeWinne, & Maes, 2005).

Among studies investigating the relationship between workplace learning and organizational performance, human resource managers are found to be the most frequent
respondents. A review of the literature also showed that a longitudinal study is not enough to measure the influence of workplace learning on performance in the organization. A lack of longitudinal studies is indicated as weakness in the workplace learning and organizational performance research because most research has used a cross-sectional design for measuring the outcomes of training. To assess the effects of workplace learning, time lags should be considered, thereby increasing the effects of workplace learning on the financial aspects of organizational performance (Faems, Sels, DeWinne, & Maes, 2005).

With regard to the relationship between workplace learning and workplace learning outcomes, numerous studies have shown that various outcomes result from workplace learning: knowledge, skills and abilities or competence, motivation, organizational commitment, employees’ work performance, transfer of learning, and motivation to transfer learning (Barney, 1991; Becker et al., 1997; Brown, 2005; Enos, Kehrhahn, & Bell, 2003; Kuvaas, 2008; Lankau & Scandura, 2002; Maurer & Lippstreu, 2008; Schuler, 1989; Tsai & Taï, 2003; Velada & Caetano, 2007).

Indeed, research findings of Aragón-Sánchez et al. (2003) and García (2005) show that training positively leads to involvement and satisfaction. In the relationship between workplace learning and organizational performance, research to date has revealed that workplace learning appears to be more strongly associated with non-financial or operational aspects of organizational performance, rather than financial aspects of organizational performance. Tharenou, Saks, and Moore (2007) found through a meta-analysis from 67 studies that training was positively related to human resource outcomes and organizational performance. However, the research results showed that
training was very weakly related to financial outcomes. Also, they suggested that, from the contingency perspective, training seemed to be more strongly related to organizational outcomes when matched with key contextual factors such as organizational capital intensity and business strategy.

Moreover, Aragón-Sánchez, Barba-Aragón, Sanz-Valle (2003) found that training activities are significantly related to effectiveness, rather than profitability, even though all training variables are not associated with the same organizational outcome measurements. Their study also demonstrated that companies making higher investments in employees’ training could obtain better results in terms of effectiveness than would those making lower expenditures in training. This finding is consistent with other evidence showing that the more the companies invest in employee training, the more likely they are to obtain better profitability (Bartel, 1994; Huselid, 1995; D’Arcimoles, 1997). In particular, training inside the company (on-the-job with external or internal trainers) positively affects the sales volume, benefits before taxes, and profitability, whereas training outside the company negatively affects sales and benefits (Aragón-Sánchez, Barba- Aragón, & Sanz-Valle, 2003).

Similarly, García (2005) found that training policy had a positive influence on organizational performance. Russell, Terborg, and Powers (1985) examined the impact of storewide training support on retail store performance and found a positive relationship between training and performance. The research findings showed that the percentage of trained employees was positively related to store performance, while training emphasis was linked with the store image. Furthermore, Faems, Sels, DeWinne, and Maes (2005) examined the effect of individual human resource domains including training on
productivity, voluntary turnover, and financial performance. The results showed that training had a positive impact on productivity, but did not have a significant relationship with voluntary turnover. Although the training effort has a positive and significant impact on productivity, this effect does not seem to considerably influence financial performance in terms of profitability, liquidity, and solvency. Additionally, using the National Organizations Survey, Delaney and Huselid (1996) examined the influence of human resource management practices, including training on perceptions of organizational performance among 590 for-profit and nonprofit firms. They found a positive relationship between human resource management practices, such as training, staffing selectivity, and incentive compensation, and perceived organizational performance.

Several researchers (Becker, Huselid, Pickus, & Spratt, 1997; Paul & Anantharaman, 2003) have proposed the intervening variables such as employee skills, employee motivations, between human resource system, operating performance, and by extension financial profits. Indeed, Paul and Anantharaman (2003) found the intervening variables, such as employee retention, employee productivity, product quality, speed of delivery, and operating cost, between HRM practice and organizational performance. In specific, they investigated whether the intervening process existed in the relationship between HRM system and organizational performance in Indian software companies. The result showed that every HRM practices such as training, job design, compensation, and incentives directly influenced the operational performance, whereas each HRM practice indirectly affected operational performance as well as financial performance.

Regarding training among other human resource functions, Paul and Anantharaman (2003) found that training enhances employee productivity, which in turn
improves financial performance. They also argued that mere linkage between human resource practices and organizational financial performance may hardly uncover the whole process. They therefore suggested that research investigating the association between workplace learning and a firm’s financial results should pay attention to the relationship among workplace learning practices, intervening variables, operational performance indicators, and financial performance. Their assertion of having an integrated approach to linking HRM practices with organizational performance came from their empirical evidence. Paul and Anantharaman’s (2003) research findings showed that no single human resource practice directly affected financial performance, but every human resource practice influenced financial outcomes indirectly through one or more intervening variables and operational performance indicators. Training among human resource practices had a direct influence on employee productivity as operational performance indicators, and employee productivity had a significant direct relationship with financial performance.

Admittedly, a final economic goal of firms is to produce financial benefits. The frequently used indicators of financial performance in empirical research for measuring financial performance include profitability (ROI, ROS, ROE, and ROA), growth in sales, total sales, sales per employee, and net profits (Aragón-Sánchez, 2003; Delery & Doty, 1996; García, 2005; Paul & Anantharaman, 2003). Many studies have used a mix of financial indicators from above described measures. However, there is no clear-cut way to measure organizational performance when examining human resource practices, as Colakoglu, Lepak, and Hong (2006) noted. Moreover, there has not been any agreement
on which are more valid indicators between objective measures such as firms’ financial
data and subjective measures responded through individuals’ self-report.
<table>
<thead>
<tr>
<th>Author</th>
<th>N /Longitudinal Study / Respondent</th>
<th>WL itself / HR Practices</th>
<th>Measures of WL</th>
<th>WL/HR Outcomes</th>
<th>Organizational Performance Outcomes</th>
<th>Organizational Financial Performance</th>
</tr>
</thead>
</table>
| Aragón-Sánchez, Barba- Aragón, Sanz-Valle (2003) | 457 SMEs in European countries / No (Cross-sectional study) / Manager | Training                 | • Training methods  
  • Training characteristics  
  • Training activities  
  • Training effort in training | Effectiveness  
  • Employees’ involvement (+, -)  
  • Human Resource indicators (+, -) | Effectiveness  
  • Quality (+, -) | Profitability  
  • Sales volume (+, -)  
  • Benefits before interest and taxes (+, -)  
  • Profitability (+, -) |
| D’Arcimoles (1997)                           | 61 / Panel data                    | HR practices             | Training                                                                 | • Productivity (+) | Return on capital employed (+) |
| Delery & Doty (1996)                         | 216 (HR manager)  
  114 (Bank president) / No (Cross-sectional study) / A senior HR manager and president in a bank | HR practices             | Training                                                                 | • The extent of providing training (formal and informal) to employees |                                    |  
  • ROA (n.s.)  
  • ROE (n.s.)  
  (secondary data source) |

Note: n.s.: non-significant / +: positive relationship / -: negative relationship / *p < 0.10, **p < 0.05, ***p < 0.01, ****p < 0.001 / SPC: Standardized Path Coefficients

Table 2.3: Empirical research on workplace learning (WL) and organizational performance
<table>
<thead>
<tr>
<th>Faems, Sels, DeWinne, Maes (2005)</th>
<th>416 in four sectors / No (Cross-sectional study) / Business manager</th>
<th>HR practices (Selection, Training, Career management, Compensation, Performance management, Participation)</th>
<th>• Training (Provision of dedication to training plan Evaluation of training effects)</th>
<th>(With training) • Productivity (value added per employee) (+, SPC 0.18) compensation (0.34), career management (0.15) and performance management (0.15) • Voluntary turnover rate (n.s.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>García (2005)</td>
<td>78 Spanish firms with more than 100 employees across multisectors / No (Cross-sectional study) / Human resource managers</td>
<td>Training itself • Perceived training policy (the functions assumed by the training service in the firm, the objectives sought by training policy in the firm, the nature of training (reactive or proactive), the evaluation of training)</td>
<td>• Perceived employee satisfaction (+, $R^2 = 0.527^{<em><strong>}$) • Perceived customer satisfaction (+, $R^2 = 0.337^{</strong></em>}$) • Owner/shareholder satisfaction (+, $R^2 = 0.410^{***}$)</td>
<td>• Firm productivity (sales per employee) (+, $R^2 = 0.137^*$)</td>
</tr>
<tr>
<td>Study</td>
<td>Sample</td>
<td>Approach</td>
<td>HR Practices</td>
<td>Perceived Training Effectiveness</td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
<td>----------</td>
<td>--------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Vlachos (2008)</td>
<td>71 food manufacturing companies in Greece / No (Cross-sectional study) / Human resource managers or managing directors</td>
<td>HR practices (Decentralization, compensation policy, information sharing, selective hiring, job security, &amp; training and development)</td>
<td>• Perceived extent of T&amp;D (perceived firm’s emphasis on training and developing its personnel)</td>
<td>(With T&amp;D) • Perceived product quality ($\beta = 0.19^*$) • Perceived production cost (n.s.) • Overall firm performance ($\beta = 0.33^{**}$)</td>
</tr>
<tr>
<td>Delaney &amp; Huselid (1996)</td>
<td>590 for-profit and nonprofit firms / No (Cross-sectional study) / Managers</td>
<td>Training among HR system (Staffing selectivity, Incentive compensation, Grievance procedure, Decentralized decision making, Internal labor market, Vertical hierarch)</td>
<td>Perceived training effectiveness</td>
<td>(With Training) • Perceived organizational performance (+, $r = 0.06^*$) - Product quality - Customer satisfaction - New product development - Essential employee retention - Essential employee attraction</td>
</tr>
<tr>
<td>Study</td>
<td>Sample Size</td>
<td>Sample Description</td>
<td>HRM Practices</td>
<td>Comprehensive Training</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Paul &amp; Anantharaman (2003)</td>
<td>370</td>
<td>Employees from 34 Indian software companies / No (Cross-sectional study) / employees and CEO or senior managers (response for organizational performance)</td>
<td>HRM practices (selection, induction, training, job design, work environment, performance appraisal, compensation, career development, &amp; incentives)</td>
<td>Training</td>
</tr>
<tr>
<td>Russell, Terborg, &amp; Powers (1985)</td>
<td>62</td>
<td>Retail stores / No (Cross-sectional study) / Store management, full-time sales personnel, and merchandising and warehouse personnel</td>
<td>Training</td>
<td>Percentage of trained employees</td>
</tr>
</tbody>
</table>
From the review of the literature, the following conceptual model was drawn, as shown in Figure 2.1. The conceptual model consisted of largely four components: (1) investment in workplace learning as an independent variable, (2) organizational outcomes of workplace learning as a mediating variable, (3) organizational perspective on HRD as a moderating variable, and (4) organizational performance. This conceptual framework was based on the logical theoretical relationships presenting that workplace learning affects organizational performance focused on financial benefits through workplace learning outcomes (Dyer & Reeves, 1995; García, 2005; Guest, 1997; Ostroff & Bowen, 2000; Tharenou, Saks, & Moore, 2007). Additionally, the argument through empirical evidence supported this conceptual framework: research investigating the association between workplace learning and a firm’s financial results should have an integrated approach by including the relationships among workplace learning practices, intervening variables such as workplace learning outcomes or operational performance indicators, and financial performance (Paul & Anantharaman, 2003).

Given these suggested relationships between workplace learning and organizational financial outcomes, investment of workplace learning was assumed to affect organizational outcomes of workplace learning, which was presumed to subsequently influence organizational financial performance. An array of workplace learning activities for employees were expected to result in improved organizational outcomes from employee learning, such as productivity and enthusiasm of employees, along with employee competence (Jacobs & Washington, 2003; Jacobs & Park, 2009).
Moreover, in the relationship between investment in workplace learning and its outcomes, the organizational perspective on HRD was considered. As noted above, the contingency perspective in the relationship between workplace learning and organizational performance (Delery & Doty, 1996) suggested that organizations with a strong organizational perspective on HRD might be different from those with relatively a weak organizational perspective on HRD. That is, organizations with greater value on HRD were expected to have superior workplace learning outcomes and subsequently better organizational performance. Therefore, the organizational perspective on HRD was expected to play a moderating role in the relationship between investment in workplace learning and its outcomes.

Accordingly, investment in workplace learning was expected to affect organizational outcomes of workplace learning by interacting with organizational perspective on HRD. Also, in turn, organizational outcomes of workplace learning were presumed to influence organizational financial performance. Therefore, workplace learning was assumed to ultimately affect organizational financial performance by being mediated through organizational outcomes of workplace learning.

In addition, it remained unclear in the literature whether there was any difference in the above relationships when examined across industrial sectors. The industries might not have the same organizational culture and priorities for employee learning, which can make a difference in the relationship between workplace learning and organizational performance. Research showed that employees in the service sector, such as banking, finance, insurance, and business consultation were more likely to participate in workplace learning than were those from the manufacturing sector; employees in service firms
participated more actively in education and training provided by their firms, as well as participated in education and training both offered by their firms and supported by themselves (Xiao & Tsang, 2004).

Based on Xiao and Tsang’s (2004) findings, the current study expected employees’ workplace learning and its outcomes to be different across the industrial sectors. Therefore, this study compared a subgroup of manufacturing industry and a subgroup of non-manufacturing industry by examining whether the fit of the measurement model and the structural equation model differed across the two subgroups.
A comparison of Industrial Sectors (Manufacturing Industry / Non-manufacturing Industry)

Figure 2.1: Conceptual framework for the study of relationships among investment in workplace learning, organizational perspective on HRD, organizational outcomes of workplace learning, and organizational performance
CHAPTER 3

METHODOLOGY

This chapter describes the methodology used to answer the research questions of the study. The first section discusses the research type. The second section provides information on the target population and sample. The third section explains the operationalization of variables. The fourth section discusses measures of variables investigated in the study. The fifth section describes the data editing by reporting how the data were screened before establishing the reliability and validity of the construct and conducting the data analysis. The final section discusses the data analysis for the proposed research questions.

Research Type

This study employed correlational research, which refers to investigating the relationship among variables and the direction of the relationship, as well as their implications for cause and effect (Ary, Jacobs, Razavieh, & Sorensen, 2006; Fraenkel, & Wallen, 2008). Correlational procedures are widely used in educational research because they allow researchers to better understand certain phenomena and to make predictions (Ary et al., 2006). The purpose of correlational research is: 1) to help explain important human behaviors, or 2) to predict likely outcomes (Fraenkel & Wallen, 2008). A major
The purpose of correlational research is to clarify our understanding of important phenomena by identifying relationships among variables. A second purpose of correlational research is predicting a score on one variable if a score on the other is known.

Correlational research differs from an experimental study, in that the variables are not manipulated; rather, the direction and strength of relationships among variables are measured (Ary et al., 2006; Vogt, 2005). Although correlational research appears to be similar to ex post facto or causal-comparative research, correlational research and ex post facto research are distinguished from the group of subjects. That is, correlational research is related to two (or more) variable measures from the same group of subjects, while ex post facto research compares two (or more) groups on the same variable measure (Ary et al., 2006). Some more sophisticated correlational procedures include multiple regression, discriminant function analysis, factor analysis, path analysis, and structural equation modeling (Fraenkel & Wallen, 2008).

Target Population and Sample

Data and Sample

The population of this study consisted of all corporations within the territory of South Korea. The data were obtained from the 2005 and 2007 Human Capital Corporate Panel (HCCP) surveys, which were conducted in 2005 and in 2007 in South Korea with support from Korea Research Institute for Vocational Education and Training (KRIVET), a government-funded research institute. The HCCP survey is based on a national probability sample of companies in South Korea. Thus, it provided a broad array of information on a representative sample of organizations and employees in South Korea.
The HCCP survey was intended to find how human resource management and human resource development practices influence corporate performance (KRIVET 2006, 2008). It is a data set consisting of: 1) corporate data, 2) employee data, 3) financial information of companies which was acquired from Korea Information Service (KIS) for sampled organizations, and 4) patent information provided by Korean Intellectual Property Office for sampled companies.

**Sampling Procedure**

A corporate sample was drawn from Korea Information Service (KIS) corporate data (2005) provided by KIS. Corporate sampling employed a stratified-random sampling method by industry, size, and type of organization. Sampling was first conducted by industry based on large and middle categories. In the process of sampling companies in terms of industry, some industries where the accumulation of human capital is rather small or non-representative were excluded, such as: 1) primary industry (agriculture, forestry, fishing) and mining & quarrying; 2) some of the manufacturing industries (manufacture of tobacco products / tanning and dressing of leather, manufacture of luggage and footwear / manufacture of wood and of products of wood and cork / manufacture of pulp, paper and paper products / publishing, printing and reproduction of recorded media / manufacture of medical, precision and optical instruments, watches and clocks / manufacture of furniture / manufacturing of articles / recycling); and 3) some tertiary industries (electricity, gas and water supply / construction / wholesale and retail trade / hotels and restaurants / transport / real estate and renting and leasing / public administration / health and social work / other community, repair and personal service
activities / private households with employed persons / extra-territorial organizations and bodies).

Then, companies with less than 100 employees were excluded before sampling them based on size. Organizations were sampled in terms of the number of employees: 100-299, 300-999, 1,000-1,999, and more than 2,000. Finally, companies were sampled in terms of corporate types, such as 1) listing, 2) KOSDAQ, and 3) registered in financial supervisory services, independent auditor, and unlisted companies. As a result, 450 companies were finally sampled. Table 3.1 shows the sampled companies by industries. Table 3.2 and Table 3.3 provide the characteristics of the sample from 2005 organizational data in HCCP by size and by organizational type respectively.

**Table 3.1: Characteristics of sample from the 2005 HCCP organizational data by industry**

<table>
<thead>
<tr>
<th>Industry (Large Category)</th>
<th>Industry (Middle Category)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>Manufacture of rubber and plastic products</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manufacture of basic metals / Manufacture of other non-metallic mineral products</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manufacture of other machinery and equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manufacture of coke, refined petroleum products and nuclear fuel / Manufacture of chemicals and chemical products</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td>Manufacture of textiles, wearing apparel and fur articles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manufacture of food products and beverages</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manufacture of motor vehicles, trailers and semi trailers / Manufacture of other transport equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manufacture of electrical machinery and apparatuses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manufacture of electronic components, radio, television, and communication equipment and apparatuses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manufacture of computers and office machinery</td>
<td></td>
</tr>
</tbody>
</table>

Continued
### Table 3.1 Continued

<table>
<thead>
<tr>
<th>Financial</th>
<th>Non-financial service</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Institutions, except insurance and pension funding / Insurance and pension funding, except compulsory social security / Activities auxiliary to financial intermediation</td>
<td>Computer and related activities</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Recreational, cultural and sporting activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Business support services / education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research and development / professional, scientific and technical services</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post and telecommunications</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>116</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Organizational Size (No. of Employees)</th>
<th>No. of Survey Organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-299</td>
<td>193</td>
</tr>
<tr>
<td>300-999</td>
<td>177</td>
</tr>
<tr>
<td>1,000-1,990</td>
<td>37</td>
</tr>
<tr>
<td>More than 2,000</td>
<td>43</td>
</tr>
<tr>
<td>Total</td>
<td>450</td>
</tr>
</tbody>
</table>

Table 3.2: Characteristics of sample from 2005 HCCP organizational data by size

<table>
<thead>
<tr>
<th>Organizational Type</th>
<th>No. of Survey Organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listing</td>
<td>143</td>
</tr>
<tr>
<td>KOSDAQ</td>
<td>137</td>
</tr>
<tr>
<td>Registered in financial supervisory service, independent auditor, and unlisted company</td>
<td>170</td>
</tr>
<tr>
<td>Total</td>
<td>450</td>
</tr>
</tbody>
</table>

Table 3.3: Characteristics of sample from the 2005 HCCP organizational data by organizational type
While a sampling size of organizations was 450, the number of received responses was 454. The number of responses is more than sampling size because some companies, which refused to participate in the survey, were substituted with other companies. But those companies, which initially refused to be invited to participate in the survey, finally participated. Therefore, corporate responses in the 2005 HCCP survey were more than an original sample size, explaining a total of 100.9%.

*Instruments and Respondents of the Survey*

The Human Capital Corporate Panel survey primarily seeks to investigate the organizational efforts in developing human resources and influence of human resource development on organizational performance. Perceptual and objective data were extensively collected on management, status of the current workforce, HRD, and HRM. Information on the financial measures of firm performance as well as patent measures was gathered. For some measures, such as the extent of investment in workplace learning, HRD managers were asked to provide their perceptions on Likert-type scales. For other measures, such as organizational size and organizational age, the respondents provided factual data.

In the section of HRD for the organizational survey, numerous items surveyed the infrastructure of workplace learning, the status of implementing workplace learning, the extent of investment in workplace learning, outcomes of workplace learning, and qualifications. The HCCP provided a useful data set for this study because it contains comprehensive information about each organization, implementation of HRD programs, their outcomes of the HRD programs, and financial information of the companies, such as total sales, net profits per employee, and return on assets.
Strategic planning directors, human resource management (HRM) managers, and human resource development (HRD) managers were asked to respond based on the related section in the questionnaire for a corporate survey. Each respondent answered questions in a separate section in the survey of each company. For example, strategic planning directors were asked to respond about the items related to management, such as an overview of business and business environment of the company. HRM managers responded to items regarding the HRM area, such as the HRM system, evaluation, promotion, compensation, downsizing, labor unions, and so on. HRD managers were invited to respond to HRD-related items, such as education and training, investment amount in education and training, number of employees who participated in education and training, time for employee education and training, HRD infrastructure, outcomes of education and training, HRD status, and qualifications.

**Operationalization of Variables**

This section describes the constructs identified for the proposed data analysis.

*Investment in Workplace Learning*

Investment in workplace learning is defined as the extent to which an organization invests its financial resources in both formal learning and informal learning. Formal learning is defined as an array of workplace learning activities previously planned and structured as the organization’s procedure in course of action. Investment in formal workplace learning was measured by HRD managers’ perceived amount of expenditure in each type of workplace learning, such as group-based off-the-job classroom training,
group-based on-the-job classroom training, e-learning, and distance training by mail, which were implemented in 2004.

In addition, investment in informal workplace learning is defined as the extent to which an organization invests its financial resources in an array of informal learning, which are intentionally arranged by the organization, but mainly occurs through relationships or interactions with others. Investment in informal workplace learning was measured by HRD managers’ perceived amount of expenditure in each type of informal workplace learning, such as mentoring or coaching, on-the-job training (OJT), task force team project, and action learning, which were implemented in 2004.

*Organizational Perspective on HRD*

Organizational perspective on HRD is defined as the extent to which an organization values talented people and human resource development (HRD) as an important strategy for organizational success. Organizational perspective on HRD was assessed by the strategic planning directors’ perceptions of top management’s value in HRD.

*Organizational Outcomes of Workplace Learning*

Organizational outcomes of workplace learning are defined as performance outcomes at the organizational level resulting from employees’ participation or engagement in learning activities. Organizational outcomes of workplace learning are a non-financial aspect of organizational performance and operational performance outcomes (Venkatraman & Ramanujam, 1986) directly affected by employees’
workplace learning. This variable was measured by HRD managers’ perceptions about the effectiveness of employees’ workplace learning in terms of employee competence, labor productivity, and employee enthusiasm.

Organizational Performance

Organizational performance is defined as organizational financial performance. Financial aspects of organizational performance refer to financial indicators of organizational outcomes. Organizational financial performance was measured by sales per employee, net profit per employee, gross margin, and return on assets (ROA), which were organizations’ financial data obtained from the Korea Information Service (KIS) in the 2007 HCCP data set. Organizational financial data were used for the year of 2006 (on December 31, 2006), which was two years after the implementation of employee learning programs in 2004.

Measures

This section describes the measures of variables under investigation in this study. In addition, it describes validity and reliability issues related to the instruments. As shown in Table 3.4, variables and their measurements are summarized.
<table>
<thead>
<tr>
<th>Latent Variables</th>
<th>Observed Variables (Measures)</th>
<th>Measurement Scale</th>
<th>Measurement Time</th>
<th>Source of Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment in Workplace Learning</td>
<td>• Group-based off-the-job classroom training&lt;br&gt;• Group-based on-the-job classroom training&lt;br&gt;• On-the-job training (OJT)&lt;br&gt;• Task force team project&lt;br&gt;• E-learning&lt;br&gt;• Distance training by mail&lt;br&gt;• Mentoring or coaching&lt;br&gt;• Action learning</td>
<td>Interval scale (5-point Likert scale)</td>
<td>Measured in 2005 for the degree of investment in employee learning implemented in 2004</td>
<td>Organization-level data in the 2005 HCCP data set</td>
</tr>
<tr>
<td>Organizational Perspective on HRD</td>
<td>• Top management’s vision for HRD&lt;br&gt;• Company’s values on talented people&lt;br&gt;• Top management’s emphasis on talented people</td>
<td>Interval scale (5-point Likert scale)</td>
<td>Measured in 2005</td>
<td>Organization-level data in the 2005 HCCP data set</td>
</tr>
<tr>
<td>Organizational Outcomes of Workplace Learning</td>
<td>• Employee competence&lt;br&gt;• Labor productivity&lt;br&gt;• Employee enthusiasm</td>
<td>Interval scale (5-point Likert scale)</td>
<td>Measured in 2005 for the workplace learning implementation in 2004</td>
<td>Organization-level data in the 2005 HCCP data set</td>
</tr>
<tr>
<td>Organizational Performance</td>
<td>• Sales per employee&lt;br&gt;• Net profit per employee&lt;br&gt;• Gross margin&lt;br&gt;• Return on Asset (ROA)</td>
<td>Ratio scale Transformed to Log</td>
<td>On December 31, 2006 (at the end of the year)</td>
<td>Objective financial data from Korea Information Service (KIS) data in the 2007 HCCP data set</td>
</tr>
</tbody>
</table>

Note. Observed variables written in Italics refer to removed variables for data analysis due to high level of missing data, even if they were originally included as measures of the latent variable, investment in workplace learning.

Table 3.4: Summary of variables and their measurement
Independent Variables

Investment in Workplace Learning. Investment in workplace learning was measured by the HRD managers’ perceived amount of expenditure in individual learning activities implemented during the year, 2004. HRD managers’ assessment was provided based on each type of workplace learning, including both formal and informal learning. Eight measures assessed the investment in workplace learning: 1) group-based on-the-job classroom training, 2) group-based off-the-job classroom training, 3) e-learning, 4) distance training by mail, 5) mentoring or coaching, 6) on-the-job training (OJT), 7) task force team project, and 8) action learning. In the instrument, HRD managers were asked to determine the extent of financial investment in each learning activity (1 = no investment to 5 = a great deal of investment) just in the case of implementing each activity in the organization.

After conducting the data editing, four measures such as e-learning, distance training by mail, mentoring or coaching, and action learning, were removed since they had high level of missing data, as specifically described in following data editing section. Thus, the reliability and validity of constructs for group-based on-the-job classroom training, group-based off-the-job classroom training, on-the-job training (OJT), and task force team project were examined.

Regarding the reliability, Cronbach’s alpha was .76, indicating a good reliable scale. Construct validity was established by exploratory factor analysis, indicating that those three items formed a factor, eigenvalue = 2.32 with 57.9% of variance explained. Factor loadings were .81 for group-based on-the-job classroom training, .71 for group-
based off-the-job classroom training, .76 for on-the-job training (OJT), and .76 for task force team project.

**Mediating Variables**

**Organizational Outcomes of Workplace Learning.** Organizational outcomes of workplace learning were measured by perceived degree of organizational level improvement derived from employees’ workplace learning participation or engagement provided during 2004. A total of three items was used to measure this construct: employees’ 1) job competence, 2) labor productivity, and 3) enthusiasm, indicating 1 (never improved) to 5 (very much improved). Cronbach’s alpha for organizational outcomes of workplace learning was .85, which showed a relatively high reliability. In addition, exploratory factor analysis established that those three items formed a factor, indicating an eigenvalue = 2.33 with 77.5% of variance explained. Factor loadings were .89 for employees’ job competence, .88 for labor productivity, and .86 for employees’ enthusiasm.

**Moderating Variables**

**Organizational Perspective on HRD.** Organizational perspective on HRD was measured by three items to assess top management’s attitude toward HRD in an organization. Strategic planning directors were asked to indicate their level of agreement on a five-point Likert-type scale (1 = strongly disagree to 5 = strongly agree). The measurement items included: 1) “The top management in my company has a clear vision toward HRD,” 2) “This company values talented people,” and 3) The top management in
my company often emphasizes the importance of talented people. Cronbach’s alpha of organizational perspective on HRD was .86, representing a fairly reliable scale. Exploratory factor analysis yielded an eigenvalue of 2.35 with 78.4% of the variance explained and factor loadings of .89 for top management’s clear vision toward HRD, .87 for company’s value for talented people, and .90 for top management’s emphasis on talented people.

**Dependent Variables**

Organizational Performance. Organizational performance was measured by financial indicators such as 1) sales per employee, 2) net profit per employee, 3) gross margin, and 4) return on asset (ROA). For the measurement of organizational performance, objective financial data obtained on December 31, 2006 from the Korea Information Service (KIS) in the 2007 HCCP dataset was used. While the net profit refers to the amount of money earned excluding all expenses, such as overhead, employee salaries, manufacturing costs, and advertising costs, from the total revenue, the gross margin is defined as the amount of money earned from the sale of goods minus the cost of the goods sold, including various costs directly related to the product such as materials and labor. Net profit can be obtained from total revenue minus total expenses, whereas gross margin is acquired from total revenue minus cost of the goods sold.

Financial measures of organizational performance are recognized as more desirable when assessing the organization-level influence of practices for employee learning (Delaney & Huselid, 1996). Indicators of organizational financial performance had approximately a two-year time lag from the implementation of workplace learning.
practice; organizational financial performance was measured using the data collected on December 31, 2006 after workplace learning activities were provided during the year, 2004.

Regarding the reliability of organizational performance, the Cronbach’s alpha was .65. Since .70 of Cronbach’s alpha is generally agreed on the lower limit for the reliability (Hair, Black, Babin, Anderson, & Tatham, 2005), return on asset (ROA) was excluded to obtain a more reliable scale, resulting in Cronbach’s alpha of .77. Then, three items were examined using exploratory factor analysis. The exploratory factor analysis showed that those three items formed a factor, indicating an eigenvalue of 2.18 with 72.7% of the variance explained. The factor loadings were .87 for sales per employee, .89 for net profit per employee, and .80 for gross margin.

**Contextual Variable**

The industrial sectors to which an organization belongs were considered for investigating any differences across industrial sectors in the relationships among variables depicted in the conceptual model. The manufacturing industry and non-manufacturing industry were compared; the non-manufacturing industry largely includes the financial industry such as finance and insurance and the non-financial service industry including computer and related activities, recreation and sports, education, research and development, and post and telecommunications.
Data Editing

Data editing is critical in structural equation modeling (SEM), because the measurement scale, missing data, outliers, nonlinearity, and nonnormality of data may affect the SEM analysis by influencing the variance-covariance among variables (Schumaker & Lomax, 2004). Therefore, the data should be carefully screened before presenting the data for the SEM analysis. Several key issues for data editing were considered: 1) missing data, 2) outliers, 3) linearity, and 4) normality (Schumaker & Lomax, 2004).

As stated, there were two data sets, the 2005 HCCP organizational data and the 2007 HCCP organizational data, to be edited for the data analysis. The 2007 HCCP organizational data were used only for variables of organizational performance. The other variables were measured using the 2005 HCCP organizational data. In addition, the 2005 HCCP organizational data represents perceptions of respondents, while the KIS data from 2007 HCCP data set contained the objective financial data.

The 2005 HCCP organizational data were first screened before pooling them together with the KIS data from the 2007 HCCP data set based on the identifiers. As shown in Table 3.5, when the data of the 2005 HCCP organization-level data were screened, the missing data were found in the observed variables of investment in workplace learning. The characteristics of the 2005 HCCP data were examined to see if the missing values were random or not. The pattern of missing values was first checked for missing completely at random (MCAR) through missing value analysis using SPSS 17.0. MCAR exists when missing values are randomly distributed across all observations. The significance value (.11) for Little’s MCAR test was not significant at p = .05. Then,
this result confirmed that the missing data were random, indicating that missing values were randomly distributed across all observations.

<table>
<thead>
<tr>
<th>Observed Variables</th>
<th>Total Sample</th>
<th>Manufacturing</th>
<th>Non-manufacturing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top management’s clear vision toward HRD</td>
<td>N 454, Missing Data 0</td>
<td>N 303, Missing Data 0</td>
<td>N 151, Missing Data 0</td>
</tr>
<tr>
<td>Company’s values for talented people</td>
<td>N 454, Missing Data 0</td>
<td>N 303, Missing Data 0</td>
<td>N 151, Missing Data 0</td>
</tr>
<tr>
<td>Top management’s emphasis on talented people</td>
<td>N 454, Missing Data 0</td>
<td>N 303, Missing Data 0</td>
<td>N 151, Missing Data 0</td>
</tr>
<tr>
<td>Group-based on-the-job classroom training</td>
<td>N 371, Missing Data 83 (18.3%)</td>
<td>N 259, Missing Data 44 (14.5%)</td>
<td>N 112, Missing Data 39 (25.8%)</td>
</tr>
<tr>
<td>Group-based off-the-job classroom training</td>
<td>N 348, Missing Data 106 (23.3%)</td>
<td>N 246, Missing Data 57 (18.8%)</td>
<td>N 102, Missing Data 49 (32.5%)</td>
</tr>
<tr>
<td>e-learning</td>
<td>N 242, Missing Data 212 (46.7%)</td>
<td>N 160, Missing Data 143 (47.2%)</td>
<td>N 82, Missing Data 69 (45.7%)</td>
</tr>
<tr>
<td>Distance training by mail</td>
<td>N 170, Missing Data 284 (62.6%)</td>
<td>N 128, Missing Data 175 (57.8%)</td>
<td>N 42, Missing Data 109 (72.2%)</td>
</tr>
<tr>
<td>Mentoring or coaching</td>
<td>N 187, Missing Data 267 (58.8%)</td>
<td>N 122, Missing Data 181 (59.7%)</td>
<td>N 65, Missing Data 86 (57.0%)</td>
</tr>
<tr>
<td>On-the-job training (OJT)</td>
<td>N 351, Missing Data 103 (22.7%)</td>
<td>N 257, Missing Data 46 (15.2%)</td>
<td>N 94, Missing Data 57 (37.7%)</td>
</tr>
<tr>
<td>Task force team project</td>
<td>N 256, Missing Data 198 (43.6%)</td>
<td>N 193, Missing Data 110 (36.3%)</td>
<td>N 63, Missing Data 88 (58.3%)</td>
</tr>
<tr>
<td>Action learning</td>
<td>N 108, Missing Data 346 (76.2%)</td>
<td>N 80, Missing Data 223 (73.6%)</td>
<td>N 28, Missing Data 123 (81.5%)</td>
</tr>
<tr>
<td>Employee competence</td>
<td>N 454, Missing Data 0</td>
<td>N 303, Missing Data 0</td>
<td>N 151, Missing Data 0</td>
</tr>
<tr>
<td>Labor productivity</td>
<td>N 454, Missing Data 0</td>
<td>N 303, Missing Data 0</td>
<td>N 151, Missing Data 0</td>
</tr>
<tr>
<td>Employee enthusiasm</td>
<td>N 454, Missing Data 0</td>
<td>N 303, Missing Data 0</td>
<td>N 151, Missing Data 0</td>
</tr>
</tbody>
</table>

Note. The numbers in parenthesis represents the percentage of missing data compared to N noted in the left column.

Table 3.5: Missing data in the 2005 HCCP organizational data
Even though there is no clear guideline of an appropriate level in deleting missing data, Hair et al. (2005) recommend that variables which have 50 percent or more missing data should be deleted. However, in this study, the cutoff of 45 percent was selected. Based on the 45 percent cutoff, missing data in each observed variable, four observed variables in investment in workplace learning (e-learning, distance training by mail, mentoring or coaching, and action learning), were removed. Then, four observed variables in workplace learning, which had less than 45 percent missing data from total sample, remained: (1) group-based on-the-job classroom training, (2) group-based off-the-job classroom training, (3) on-the-job training (OJT), and (4) task force team project. After removing several variables with high instances of missing data, cases without any data in four variables regarding investment in workplace learning were further removed, resulting in 427 cases.

Next, outliers across all variables were examined. Outliers are observations with extreme and atypical characteristics, which are different from the other observations (Hair et al., 2005). Outliers should be detected and possibly deleted because they may unnecessarily influence the mean, standard deviation, and correlation coefficient values (Schumaker & Lomax, 2004). Outliers were detected with descriptive statistics and graphical methods: (1) examining the observations on each variable individually by descriptive statistics and boxplot, and (2) examining scatterplots involving two variables.

Table 3.6 provides information of mean and 5% trimmed mean for observed variables. The 5% trimmed mean indicates that the mean value after removing the top and bottom 5% of scores. The comparison of the 5% trimmed mean to the mean was used to identify whether extreme values would have influenced the variables.
With the comparison of the trimmed mean with the mean for the each variable, the observed variable of top management’s emphasis on talented people showed the most difference (the mean: 3.85, the trimmed mean after removing 5% of top and bottom of scores: 3.92) rather than other variables which indicated minimal differences. Then, the observed variable, top management’s emphasis on talented people was identified as the variable with the most outliers. In addition, outliers in the observed variables other than top management’s emphasis on talented people indicated that the outliers did not much affect the mean score of each variable since the impact of outliers seemed to be mild.

<table>
<thead>
<tr>
<th>Observed Variables</th>
<th>Mean</th>
<th>5% Trimmed Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top management’s clear vision toward HRD</td>
<td>3.57</td>
<td>3.59</td>
</tr>
<tr>
<td>Company’s values for talented people</td>
<td>3.75</td>
<td>3.79</td>
</tr>
<tr>
<td>Top management’s emphasis on talented people</td>
<td>3.85</td>
<td>3.92</td>
</tr>
<tr>
<td>Group-based on-the-job classroom training</td>
<td>3.29</td>
<td>3.27</td>
</tr>
<tr>
<td>Group-based off-the-job classroom training</td>
<td>3.41</td>
<td>3.40</td>
</tr>
<tr>
<td>On-the-job training (OJT)</td>
<td>3.07</td>
<td>3.04</td>
</tr>
<tr>
<td>Task force team project</td>
<td>3.38</td>
<td>3.38</td>
</tr>
<tr>
<td>Employee competence</td>
<td>3.33</td>
<td>3.35</td>
</tr>
<tr>
<td>Labor productivity</td>
<td>3.17</td>
<td>3.18</td>
</tr>
<tr>
<td>Employee enthusiasm</td>
<td>3.36</td>
<td>3.35</td>
</tr>
</tbody>
</table>

Table 3.6: Descriptive statistics of mean and 5% trimmed mean of variables (N=427)

Additionally, the observed variables were examined using a graphical method, boxplot and extreme values. Figure 3.1 shows the boxplot of each observed variable. The boxplot shows outliers, indicating both mild outliers (any score between 1.0 and 1.5 quartiles away from the middle 50% of the scores which is the shaded region) and extreme outliers (any score greater than 1.5 quartiles away from the middle 50% of the
scores which is the shaded region, indicated by stars) (Hair et al., 2005). When examining the boxplot of each observed variable, several mild outliers were identified across the variables since outliers were within the range of 1.0 quartile.

Figure 3.1: Boxplots of observed variables in the 2005 HCCP organizational data (N=427)
Besides the boxplots, for more specific examination of each variable for the outliers, a statistical way for identifying extreme values was also employed. Since boxplots showed no highest outliers in the data distribution across all variables, Table 3.7 contained only lowest extreme values of each observed variable by indicating case numbers. The outliers with case number, which indicated in the following table, included all outliers shown in the boxplots which above showed. Then, the *italics* in the case number and value indicate the examined outliers to determine whether they should be retained and deleted. All the outliers indicated in the Table 3.7 were decided to retain since they did not much influence mean scores of observed variables, as shown in Table 3.6. Thus, the observed variable, top management’s emphasis on talented people, was further examined by using a scatterplot matrix to evaluate the information of outliers by assessing the characteristics of each outlier.

<table>
<thead>
<tr>
<th>Observed Variables</th>
<th>Case Number</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top management’s clear vision toward HRD</td>
<td>Lowest</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>335</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>182</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>118</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>420</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>418</td>
</tr>
<tr>
<td>Company’s values for talented people</td>
<td>Lowest</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>415</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>182</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>349</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>335</td>
</tr>
</tbody>
</table>

Table 3.7: Extreme values of each observed variable in the 2005 HCCP organizational data (N=427)
Table 3.7 Continued

| Top management’s emphasis on talented people | Lowest | 335 | 1 |
|                                           | 2      | 228 | 1 |
|                                           | 3      | 182 | 1 |
|                                           | 4      | 118 | 1 |
|                                           | 5      | 79  | 1 |
| Group-based on-the-job Classroom training  | Lowest | 246 | 1 |
|                                           | 2      | 420 | 2 |
|                                           | 3      | 418 | 2 |
|                                           | 4      | 370 | 2 |
|                                           | 5      | 361 | 2 |
| Group-based off-the-job classroom training | Lowest | 43  | 1 |
|                                           | 2      | 420 | 2 |
|                                           | 3      | 418 | 2 |
|                                           | 4      | 361 | 2 |
|                                           | 5      | 335 | 2 |
| On-the-job training (OJT)                  | Lowest | 420 | 1 |
|                                           | 2      | 370 | 1 |
|                                           | 3      | 360 | 1 |
|                                           | 4      | 413 | 2 |
|                                           | 5      | 371 | 2 |
| Task force team project                   | Lowest | 420 | 1 |
|                                           | 2      | 370 | 1 |
|                                           | 3      | 337 | 2 |
|                                           | 4      | 329 | 2 |
|                                           | 5      | 323 | 2 |
| Employee competence                       | Lowest | 418 | 2 |
|                                           | 2      | 401 | 2 |
|                                           | 3      | 340 | 2 |
|                                           | 4      | 335 | 2 |
|                                           | 5      | 247 | 2 |
| Labor productivity                        | Lowest | 418 | 2 |
|                                           | 2      | 401 | 2 |
|                                           | 3      | 341 | 2 |
|                                           | 4      | 337 | 2 |
|                                           | 5      | 335 | 2 |
| Employee enthusiasm                       | Lowest | 182 | 1 |
|                                           | 2      | 420 | 2 |
|                                           | 3      | 401 | 2 |
|                                           | 4      | 340 | 2 |
|                                           | 5      | 335 | 2 |
To ascertain the impact of the outliers on the relationship between the independent variable and the dependent variable, the scatterplots with the variables of “top management’s emphasis on talented people” and organizational outcomes of workplace learning (employee competence, labor productivity, and employee enthusiasm) were employed. The scatterplot was used to examine the relationship between independent variable and the dependent variable. In addition, a scatterplot matrix helps researchers detect outliers through observations, which are away from the typical distribution (Hair et al., 2005).

For the outliers (case numbers of 335, 228, 182, 118, & 79) in the variable of top management’s emphasis on talented people, Figure 1, Figure 2, and Figure 3 in Appendix B show the characteristics of the variable in relation to organizational outcomes of workplace learning (employee competence, labor productivity, and employee enthusiasm). All five outliers (case numbers of 335, 228, 182, 118, & 79) were decided to retain because they were marginally inside the distribution. Furthermore, as expected, outliers with the lowest value of top management’s emphasis on talented people were related to low level of learning outcomes. This result confirmed the decision of retaining outliers.

Moreover, to make certain whether the outliers in the variables of investment in workplace learning should be retained or eliminated, the assessments were further conducted to see whether the extent of investment in learning were associated with organizational size. On the basis of Figure 4, 5, and 6 in Appendix B, the outliers with the lowest values were determined to retain because those cases were related to organizational size. More specifically, the outliers were small-sized organizations, and
then those small-sized companies seemed to less invest in employee learning. Therefore, the outliers in the variables across the investment in workplace learning (group-based on-the-job classroom training, group-based off-the-job classroom training, on-the-job training (OJT), and task force team project) were retained to represent the population of small companies.

As described, all outliers were determined to retain since they represented meaningful characteristics of the population even if they were different from the majority of the sample. Then, linearity was tested by plotting the data in a scatterplot to examine whether the data were linearly increasing or decreasing. Linearity was found as adequate by representing the data as linearly increasing. Additionally, normality was checked across the variables. Table 3.8 showed that all observed variables had moderate normality in terms of skewness and kurtosis, indicating that all observed variables were less than ±1.5.

<table>
<thead>
<tr>
<th>Observed Variables</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>Degree of Normality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top management’s clear vision toward HRD</td>
<td>-.507</td>
<td>.236</td>
<td>Moderate</td>
</tr>
<tr>
<td>Company’s values for talented people</td>
<td>-.654</td>
<td>.522</td>
<td>Moderate</td>
</tr>
<tr>
<td>Top management’s emphasis on talented people</td>
<td>-.975</td>
<td>1.399</td>
<td>Moderate</td>
</tr>
<tr>
<td>Group-based on-the-job classroom training</td>
<td>.213</td>
<td>-.130</td>
<td>Moderate</td>
</tr>
<tr>
<td>Group-based off-the-job classroom training</td>
<td>-.008</td>
<td>.238</td>
<td>Moderate</td>
</tr>
<tr>
<td>On-the-job training (OJT)</td>
<td>.110</td>
<td>-.502</td>
<td>Moderate</td>
</tr>
<tr>
<td>Task force team project</td>
<td>-.037</td>
<td>-.122</td>
<td>Moderate</td>
</tr>
<tr>
<td>Employee competence</td>
<td>-.050</td>
<td>-.330</td>
<td>Moderate</td>
</tr>
<tr>
<td>Labor productivity</td>
<td>.127</td>
<td>.063</td>
<td>Moderate</td>
</tr>
<tr>
<td>Employee enthusiasm</td>
<td>.067</td>
<td>.210</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Table 3.8: Normality of variables before handling missing data in the 2005 HCCP organizational data (N=427)
Next, the missing data were handled because missing data affects values in variables. Missing data were handled with the matching response-pattern approach using LISREL-PRELIS because this method is recommended when larger amounts of missing data are random (Schumaker & Lomax, 2004). Since the missing data were found to be random, the pattern-matching imputation was considered to be the most appropriate way among several options for dealing with missing data. The matching response-pattern approach through multiple imputations refers to “matching variables with incomplete data to variables with complete data to determine a missing value” (Schumaker & Lomax, 2004, p. 25). That is, in the method of the pattern-matching imputation, a missing value in an incomplete case was replaced from a complete case with a similar response pattern over matching variables.

After handling the missing data, the KIS data in the 2007 HCCP data set were screened. There were 454 cases for the year, 2006 in the KIS data, but 18 cases did not contain the financial information. Thus, 18 cases were removed, and then 436 cases remained in the KIS data from the 2007 HCCP data set. Then, the 2005 HCCP organizational data with 427 cases and the KIS data from the 2007 HCCP data set with 436 cases were pooled together by matching identifiers. The matching of two data sets resulted in 412 cases after removing cases which were not successfully matched when the two data sets did not have the same identifiers.

Next, data were screened for the variables in the KIS data from the 2007 HCCP data set just like the 2005 HCCP organizational data. The difference between the two data sets in terms of data editing was implementation of the data transformation, since the data distributions of organizational performance in 2007 HCCP were widely divergent. In
other words, the normality was violated for sales per employee, net profit per employee, gross margin, and ROA in the organizational performance, indicating that both skewness and kurtosis were far from a moderate range. In situations where the assumption of normality is not met, data transformation is suggested for correcting nonnormality (Schumaker & Lomax, 2004). Thus, the logarithmic transformation was conducted for observed variables including sales per employee, net profit per employee, gross margin, and ROA.

In particular, outliers were carefully assessed to determine whether they represented the characteristics of the population, as Hair et al. (2005) suggested. Figure 8 through 15 in Appendix B show a histogram with normal curve for variable regarding organizational performance (sales per employee, net profit per employee, gross margin, and return on asset). According to boxplots of variables of organizational performance, extreme outliers existed particularly in the variables of sales per employee and return on asset, indicating nonnormality. To decide whether extreme outliers should be retained and deleted, the distribution of the sample were considered using histogram with normal curve, as shown in Appendix B. In other words, even though outliers were extreme, they were evaluated in terms of how representative it is of the population. For example, the boxplot of gross margin, which is shown in Figure 13, had many outliers, but only one case were removed (case 190) since the remainder of outliers (such as outliers close to high extreme value of 10) were considered as being indicative of characteristics of the population, as depicted in Figure 12.

Throughout the processes of assessing the characteristics of outliers, 13 outliers which were viewed as not representing the population were eliminated: 6 cases for sales
per employee, 1 case for gross margin, and 6 cases for return on asset. Consequently, 399 cases remained as usable data for the total sample data including both 2005 organizational data and 2007 KIS data.

Additionally, SEM assumes multivariate normality, which means that all the univariate distributions are normal, and the joint distribution of any pair of the variables is bivariate normal. Data which are skewed or flat impact statistics, in which case they should be checked (Schumaker & Lomax, 2004). Multivariate normality was detected through the inspection of the presence of skewness and kurtosis (Klein, 2005). Graphical methods were also used by looking at a histogram with the normal curve and the normal probability plots (Hair et al., 2005). A skewness value greater than 3.0 and values of kurtosis greater than 10.0 may suggest a problem in normality (Klein, 2005).

As Table 3.9 shows, the normality was within acceptable range across all variables, indicating that both skewness and kurtosis of all variables were less than 1.5. Therefore, the violation of normality does not exist. Additionally, all variables showed good shapes of normality curves and the points were revealed to follow approximately along the diagonal line, thereby concluding that the data were normally distributed. As a result of the data editing such as missing data, outliers, linearity, and normality, 399 usable cases were left.
<table>
<thead>
<tr>
<th>Observed Variables</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>Degree of Normality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top management’s clear vision toward HRD</td>
<td>-.282</td>
<td>-.107</td>
<td>Moderate</td>
</tr>
<tr>
<td>Company’s values for talented people</td>
<td>-.618</td>
<td>.825</td>
<td>Moderate</td>
</tr>
<tr>
<td>Top management’s emphasis on talented people</td>
<td>-.875</td>
<td>1.169</td>
<td>Moderate</td>
</tr>
<tr>
<td>Group-based on-the-job classroom training</td>
<td>.295</td>
<td>.269</td>
<td>Moderate</td>
</tr>
<tr>
<td>Group-based off-the-job classroom training</td>
<td>.191</td>
<td>.368</td>
<td>Moderate</td>
</tr>
<tr>
<td>On-the-job training (OJT)</td>
<td>.296</td>
<td>-.023</td>
<td>Moderate</td>
</tr>
<tr>
<td>Task force team project</td>
<td>.260</td>
<td>.841</td>
<td>Moderate</td>
</tr>
<tr>
<td>Labor productivity</td>
<td>.119</td>
<td>.166</td>
<td>Moderate</td>
</tr>
<tr>
<td>Employee enthusiasm</td>
<td>.060</td>
<td>.127</td>
<td>Moderate</td>
</tr>
<tr>
<td>Sales per employee</td>
<td>.031</td>
<td>.998</td>
<td>Moderate</td>
</tr>
<tr>
<td>Net profit per employee</td>
<td>.025</td>
<td>.010</td>
<td>Moderate</td>
</tr>
<tr>
<td>Gross margin</td>
<td>.356</td>
<td>1.026</td>
<td>Moderate</td>
</tr>
<tr>
<td>Return on asset</td>
<td>-.786</td>
<td>1.143</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Table 3.9: Normality of variables after data editing for the 2005 and 2007 HCCP (N=399)
Data Analysis

The data were analyzed using descriptive and inferential statistical analyses. Descriptive statistics for means, standard deviations, and correlations among variables were analyzed using SPSS 17.0. In addition, structural equation modeling (LISREL 8.8; Jöreskog & Sörbom, 1993) was used to assess the relationships among the variables in the conceptual model depicted in Figure 3.1. Structural equation modeling (SEM) enables researchers to identify latent variables and test the full structural equation model simultaneously.

SEM is a multivariate statistical analysis tool that enables researchers to test complex multivariable models simultaneously. Moreover, SEM allows researchers to explicitly examine latent and observed variables as well as endogenous variables, underlying dependent variables, and exogenous variables, external predictors. SEM can also help to explore both direct and indirect effects of variables involved in a given model (Shumacker & Lomax, 2004; Klein, 2005). Furthermore, SEM explicitly estimates error variance, whereas traditional multivariate approaches do not take error variance into account (Raykov & Marcoulides, 2006).

SEM was performed using a two-step approach: 1) confirmatory factor model analysis and 2) structural model analysis as recommended by Anderson and Gerbing (1988). A confirmatory factor model, also called a “measurement model,” was first identified to determine whether the latent variables were defined. Then a structural equation model was tested to identify the relationships among the variables with a set of equations simultaneously. While the confirmatory factor model indicates the relationships among observed variables underlying the latent variables, the structural model specifies
relationships among the latent variables (Schumaker & Lomax, 2004). In the two-step approach, a strong measurement model should be first confirmed before implementing the structural model.

Each research question in this study and the relationship among the variables were assessed. The proposed research questions were analyzed as follows:

*Research Question 1: What is the relationship between investment in workplace learning and organizational outcomes of workplace learning?*

In order to answer Research Question 1, the structural equation model was analyzed for interpreting the parameter estimates based on the following criteria, which Shumacker and Lomax (2004) recommended. The statistical significance of the parameter estimates for the path between investment in workplace learning and organizational outcomes of workplace learning was examined. The statistical significance of this path was judged by a critical value, which is also referred to as a $t$ value of 1.96 at the .05 level of significance. That is, the parameter estimate of this path was examined to determine whether it was significantly different from 0 using the $t$ values.

Next, parameter estimates were investigated to determine whether they had the expected direction, either negative or positive relationship. Parameter estimates were also examined using standardized path coefficients to determine whether they were within a reasonable range of magnitude. Finally, standardized path coefficients were assessed; these can be viewed as a standardized regression coefficient for one latent variable in relation to another when the effects of all other variables are partialed out.

*Research Question 2: Does organizational perspective on HRD moderate between investment in workplace learning and organizational outcomes of workplace learning?*
In order to answer Research Question 2, a multiple-group analysis was conducted to examine whether organizational perspective on HRD plays a role as a moderator between investment in workplace learning and organizational outcomes of workplace learning. According to Baron and Kenny (1986), moderation refers to the function “which partitions a focal independent (predictor) variable into subgroups that establish its domains of maximal effectiveness in regard to a given dependent variable” (p. 1173). Additionally, moderation is defined as a third variable that acts as a controlling condition for the effect of a predictor (X) on an outcomes (Y); then, the effect of X on Y varies across levels of a moderator (Hopwood, 2007).

To assess the moderating influence of organizational perspective on HRD, the data were divided into two groups: 1) low level of organizational perspective on HRD, and 2) high level of organizational perspective on HRD based on the median of the organizational perspective on HRD. Then, those two groups were tested to see whether their measurement models were different. If the measurement models were different, it could be concluded that two groups are different. Finally, the standardized coefficients in the paths of investment in workplace learning and organizational outcomes of workplace learning were compared between the two groups when the two models were found to be different.

*Research Question 3: Do organizational outcomes of workplace learning mediate between investment in workplace learning and organizational performance?*

In order to answer Research Question 3, the structural equation model was analyzed by investigating direct effects and indirect effects among the variables investment in workplace learning, organizational outcomes out workplace learning, and
organizational performance through effect decomposition.

*Research Question 4: What is the relationship between organizational outcomes of workplace learning and organizational performance?*

In order to answer Research Question 4, the structural equation model was analyzed for interpreting the parameter estimates based on the following criteria which Shumacker and Lomax (2004) recommended. The statistical significance of the parameter estimates for the path between organizational outcomes of workplace learning and organizational performance was examined. The statistical significance of this path was judged by a critical value, which is also referred to as a *t* value of 1.96 at the .05 level of significance. That is, the parameter estimate of this path was examined to determine whether it was significantly different from 0 using the *t* values.

Then, parameter estimates were investigated to determine whether they had the expected direction of either negative or positive relationship. Parameter estimates were also examined using standardized path coefficients to determine whether they were within a reasonable range of magnitude. Finally, standardized path coefficients were assessed; these can be viewed as a standardized regression coefficient for one latent variable in relation to another when the effects of all other variables are partialed out.

*Research Question 5: Are manufacturing industry and non-manufacturing industry groups different in terms of the fit of the measurement model and the structural equation model?*

In order to answer Research Question 5, a multiple-group model analysis was employed to determine whether the conceptual model proposed in this study was the same for both the manufacturing industry and the non-manufacturing industry. Group
differences between the manufacturing industry and the non-manufacturing industry can be assessed through multiple-group SEM models (Schumaker & Lomax, 2004). The multiple-group models for the manufacturing and non-manufacturing industries were examined based on test processes suggested by Schumaker and Lomax (2004). The measurement model analysis was first conducted to examine the acceptance of the measurement models and measurement invariance for the groups. Depending on the results of the measurement model analysis, whether or not the structural model analysis needed to be conducted was decided. That is, if the measurement models were statistically identical between the two groups, the structural model analysis needed to be further carried out to examine statistically significant differences in standardized path coefficients between the two groups.
CHAPTER 4

RESULTS

This chapter presents the results from the analysis of the data. The first section reports the descriptive statistics. The second section provides the results of the confirmatory factor analysis. The third section presents the results of the structural equation model. The fourth section offers the results of the moderation effect test for the latent variable of organizational perspective on HRD. The fifth section provides the results of multiple group models for two industrial sectors (manufacturing industry and non-manufacturing industry). The sixth section reports the results of the mediation effect test for the latent variable of organizational outcomes of workplace learning. The final section presents the results of the analysis for each research question.

Descriptive Statistics

This section describes the demographic characteristics of the 399 subjects as the usable data. The demographic characteristics were analyzed separately by industrial sectors. The characteristics for the overall sample and manufacturing industry as well as non-manufacturing industry are described, since this study investigated multiple samples.

Table 4.1 provides the characteristics of the total sample and two industrial sub-samples. Most companies in the manufacturing industry were manufacturers of electronic
components, radio, television, and communication equipment and apparatuses, whereas most companies in the non-manufacturing industry were in the area of computer and related activities. In the case of organizational size in terms of number of employees, companies with 100-299 and 300-999 employees comprised more than 80% of the total sample and subgroups. One worth mentioning characteristic of the type of organization was that the type registered in financial supervisory service, independent auditor, and unlisted company showed the highest percentage in the non-manufacturing industry, while the overall sample and manufacturing industry had more or less similar percentages among three types of organization.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Total</th>
<th>Manufacturing Industry</th>
<th>Non-manufacturing</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>399</td>
<td>280</td>
<td>119</td>
</tr>
<tr>
<td>Middle Category of Industry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacture of rubber and plastic products</td>
<td>13</td>
<td>13</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(3.3%)</td>
<td>(4.6%)</td>
<td></td>
</tr>
<tr>
<td>Manufacture of basic metals</td>
<td>47</td>
<td>47</td>
<td>-</td>
</tr>
<tr>
<td>Manufacture of other non-metallic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mineral products</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacture of other machinery</td>
<td>25</td>
<td>25</td>
<td>-</td>
</tr>
<tr>
<td>and equipment</td>
<td>(6.3%)</td>
<td>(8.9%)</td>
<td></td>
</tr>
</tbody>
</table>

Note: The numbers in parentheses indicate the percentage in each sample.

Table 4.1: Characteristics of used total sample and subgroups
Table 4.1 Continued

<table>
<thead>
<tr>
<th>Activity</th>
<th>2001</th>
<th>2002</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacture of coke, refined petroleum products and nuclear fuel / Manufacture of chemicals and chemical products</td>
<td>38</td>
<td>38</td>
<td>-</td>
</tr>
<tr>
<td>Manufacture of textiles, wearing apparel and fur articles</td>
<td>12</td>
<td>12</td>
<td>-</td>
</tr>
<tr>
<td>Manufacture of food products and beverages</td>
<td>23</td>
<td>23</td>
<td>-</td>
</tr>
<tr>
<td>Manufacture of motor vehicles, trailers and semi trailers / Manufacture of other transport equipment</td>
<td>40</td>
<td>40</td>
<td>-</td>
</tr>
<tr>
<td>Manufacture of electrical machinery and apparatuses</td>
<td>17</td>
<td>17</td>
<td>-</td>
</tr>
<tr>
<td>Manufacture of electronic components, radio, television, &amp; communication equipment and apparatuses</td>
<td>60</td>
<td>60</td>
<td>-</td>
</tr>
<tr>
<td>Manufacture of computers and office machinery</td>
<td>5</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>Financial institutions, except insurance and pension funding / Insurance and pension funding, except compulsory social security / Activities auxiliary to financial intermediation</td>
<td>33</td>
<td>-</td>
<td>33</td>
</tr>
<tr>
<td>Computer and related activities</td>
<td>38</td>
<td>-</td>
<td>38</td>
</tr>
<tr>
<td>Recreational, cultural and sporting activities</td>
<td>6</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>Business support services/ education</td>
<td>15</td>
<td>-</td>
<td>15</td>
</tr>
<tr>
<td>Research and development/ professional, scientific, &amp; technical services</td>
<td>21</td>
<td>-</td>
<td>21</td>
</tr>
<tr>
<td>Post and telecommunications</td>
<td>6</td>
<td>-</td>
<td>6</td>
</tr>
</tbody>
</table>

Continued
Table 4.1 Continued

<table>
<thead>
<tr>
<th>Size of Organization</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100-299</td>
<td>157 (39.3%)</td>
<td>112 (40.0%)</td>
<td>45 (37.8%)</td>
</tr>
<tr>
<td>300-999</td>
<td>167 (41.9%)</td>
<td>121 (43.2%)</td>
<td>46 (38.7%)</td>
</tr>
<tr>
<td>1,000-1,990</td>
<td>32 (8.0%)</td>
<td>20 (7.1%)</td>
<td>12 (10.1%)</td>
</tr>
<tr>
<td>More than 2,000</td>
<td>43 (10.8%)</td>
<td>27 (9.6%)</td>
<td>16 (13.4%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of Organization</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Listing</td>
<td>128 (32.1%)</td>
<td>109 (38.9%)</td>
<td>19 (16.0%)</td>
</tr>
<tr>
<td>KOSDAQ</td>
<td>117 (29.3%)</td>
<td>89 (31.8%)</td>
<td>28 (23.5%)</td>
</tr>
<tr>
<td>Registered in financial supervisory service, independent auditor, and unlisted company</td>
<td>154 (38.6%)</td>
<td>82 (29.3%)</td>
<td>72 (60.5%)</td>
</tr>
</tbody>
</table>

In addition, Table 4.2 presents the means, standard deviations, and correlations for all variables for the total sample. Descriptive statistics and correlations for the subgroups of the manufacturing industry and the non-manufacturing industry are presented in Table 4.3.
Table 4.2: The means, standard deviations, and correlations for the total sample

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Clear vision toward HRD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Valuing talents</td>
<td>.64**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Emphasis on talented people</td>
<td>.72**</td>
<td>.67**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. On-the-job classroom training</td>
<td>.30**</td>
<td>.19**</td>
<td>.26**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Off-the-job classroom training</td>
<td>.26**</td>
<td>.21**</td>
<td>.22**</td>
<td>.57**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. OJT</td>
<td>.28**</td>
<td>.27**</td>
<td>.27**</td>
<td>.46**</td>
<td>.28**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. TFT project</td>
<td>.19**</td>
<td>.16**</td>
<td>.31**</td>
<td>.41**</td>
<td>.34**</td>
<td>.57**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Employee competence</td>
<td>.34**</td>
<td>.30**</td>
<td>.35**</td>
<td>.53**</td>
<td>.41**</td>
<td>.40**</td>
<td>.32**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Labor productivity</td>
<td>.39**</td>
<td>.23**</td>
<td>.31**</td>
<td>.43**</td>
<td>.33**</td>
<td>.37**</td>
<td>.31**</td>
<td>.70**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Employee enthusiasm</td>
<td>.40**</td>
<td>.33**</td>
<td>.38**</td>
<td>.42**</td>
<td>.35**</td>
<td>.36**</td>
<td>.32**</td>
<td>.65**</td>
<td>.63**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Sales per employee</td>
<td>.06</td>
<td>-.04</td>
<td>.07</td>
<td>.11*</td>
<td>.08</td>
<td>.07</td>
<td>.12*</td>
<td>.10*</td>
<td>.11*</td>
<td>.09</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Net profit per employee</td>
<td>.10</td>
<td>.03</td>
<td>.10*</td>
<td>.12*</td>
<td>.08</td>
<td>.10</td>
<td>.10*</td>
<td>.15*</td>
<td>.14**</td>
<td>.17**</td>
<td>.70**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>13. Gross margin</td>
<td>.12*</td>
<td>.06</td>
<td>.14**</td>
<td>.31**</td>
<td>.14**</td>
<td>.22**</td>
<td>.25**</td>
<td>.31**</td>
<td>.28**</td>
<td>.27**</td>
<td>.50**</td>
<td>.57**</td>
<td>1</td>
</tr>
</tbody>
</table>

| M          | 3.49 | 3.76 | 3.76 | 3.08 | 3.27 | 2.83 | 3.17 | 3.18 | 3.00 | 3.22 | 5.52 | 4.17 | 7.32 |
| SD         | 0.84 | 0.76 | 0.84 | 0.80 | 0.71 | 0.82 | 0.72 | 0.59 | 0.64 | 0.71 | 0.38 | 0.54 | 0.72 |

Note. Sales per employee, net profit per employee, and gross margin were log transformed.

** p < .01  * p < .05
<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Clear vision toward HRD</td>
<td></td>
<td>.64**</td>
<td>.74**</td>
<td>.29**</td>
<td>.25**</td>
<td>.36**</td>
<td>.19*</td>
<td>.32**</td>
<td>.33**</td>
<td>.34**</td>
<td>.07</td>
<td>.11</td>
<td>.16</td>
</tr>
<tr>
<td>2. Valuing talents</td>
<td>.64**</td>
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<td>.65**</td>
<td>.14</td>
<td>.13</td>
<td>.21*</td>
<td>.07</td>
<td>.23*</td>
<td>.17</td>
<td>.23**</td>
<td>-.13</td>
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<tr>
<td>3. Emphasis on talented people</td>
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<td>.67**</td>
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<td>.23*</td>
<td>.19*</td>
<td>.28**</td>
<td>.28**</td>
<td>.37**</td>
<td>.25**</td>
<td>.32**</td>
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<td>.05</td>
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<tr>
<td>4. On-the-job classroom training</td>
<td>.28**</td>
<td>.19**</td>
<td>.26**</td>
<td></td>
<td>.54**</td>
<td>.45**</td>
<td>.41**</td>
<td>.55**</td>
<td>.52**</td>
<td>.47**</td>
<td>.19*</td>
<td>.14</td>
<td>.27**</td>
</tr>
<tr>
<td>5. Off-the-job classroom training</td>
<td>.26**</td>
<td>.23**</td>
<td>.24**</td>
<td>.58**</td>
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<td>.29**</td>
<td>.35**</td>
<td>.42**</td>
<td>.42**</td>
<td>.36**</td>
<td>.07</td>
<td>.04</td>
<td>.12</td>
</tr>
<tr>
<td>6. OJT</td>
<td>.24**</td>
<td>.29**</td>
<td>.27**</td>
<td>.47**</td>
<td>.27**</td>
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<td>.54**</td>
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<td>.26</td>
</tr>
<tr>
<td>7. TFT project</td>
<td>.20**</td>
<td>.20**</td>
<td>.33**</td>
<td>.42**</td>
<td>.35**</td>
<td>.58**</td>
<td></td>
<td>.22*</td>
<td>.27**</td>
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</tr>
<tr>
<td>8. Employee competence</td>
<td>.34**</td>
<td>.32**</td>
<td>.33**</td>
<td>.51**</td>
<td>.39**</td>
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<td>11. Sales per employee</td>
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<td>.14*</td>
<td>.11</td>
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<tr>
<td>12. Net profit per employee</td>
<td>.09</td>
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<td>.13*</td>
<td>.11</td>
<td>.11</td>
<td>.09</td>
<td>.12*</td>
<td>.15*</td>
<td>.16**</td>
<td>.19**</td>
<td>.65**</td>
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<td>.63**</td>
</tr>
<tr>
<td>13. Gross margin</td>
<td>.09</td>
<td>.08</td>
<td>.15*</td>
<td>.32**</td>
<td>.14*</td>
<td>.20**</td>
<td>.28**</td>
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<td>.25**</td>
<td>.27**</td>
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<td>.53**</td>
</tr>
</tbody>
</table>

| Manufacturing                                 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| M                                             | 3.43 | 3.70 | 3.73 | 3.01 | 3.23 | 2.81 | 3.18 | 3.13 | 2.97 | 3.20 | 5.55 | 4.18 | 7.29 |
| SD                                            | 0.80 | 0.74 | 0.83 | 0.81 | 0.66 | 0.84 | 0.75 | 0.56 | 0.62 | 0.70 | 0.33 | 0.49 | 0.69 |

| Non-manufacturing                             |      |      |      |      |      |      |      |      |      |      |      |      |      |
| M                                             | 3.62 | 3.88 | 3.84 | 3.26 | 3.37 | 2.87 | 3.16 | 3.29 | 3.06 | 3.29 | 5.43 | 4.17 | 7.39 |
| SD                                            | 0.92 | 0.80 | 0.84 | 0.75 | 0.80 | 0.76 | 0.64 | 0.64 | 0.69 | 0.74 | 0.47 | 0.66 | 0.79 |

Note. The manufacturing industrial group results are below the diagonal cross-section. The non-manufacturing industrial group
results are above the diagonal cross-section. Sales per employee, net profit per employee, and gross margin were log transformed.

** p < .01  * p < .05

Table 4.3: The means, standard deviations, and correlations for the manufacturing industry and the non-manufacturing industry
The Confirmatory Factor Model

The confirmatory factor model specifies the relationships among the observed variables for each of the latent variables. As Anderson and Gerbing (1988) suggested, confirmatory factor analysis was first conducted to establish a strong measurement model before implementing the structural model.

Model Specification

Model specification is a first step in analyzing a confirmatory factor model by developing a theoretical model (Schumaker & Lomax, 2004). All relationships and parameters in the model under investigation are determined through model specification. A model is believed to be appropriately specified when the true population model is identical with the theoretical model being tested (Schumaker & Lomax, 2004). Therefore, it is important to find the model that best reproduces the sample covariance matrix \( S \) from the true population model.

Figure 4.1 displays a confirmatory factor model, which contains thirteen observed variables with four different latent variables (factors) being hypothesized. In the model, each observed variable was hypothesized to measure only a single factor, and the factors were believed to be correlated. In addition, the measurement error variances were not related. The confirmatory factor model includes thirteen factor loadings, thirteen measurement error variances, and six correlations among the factors with zero correlated measurement errors.
Figure 4.1: The Confirmatory factor model
Model Identification

After a confirmatory factor model is identified, the model identification should be addressed to solve the identification problem prior to the estimation of the model. The identification problem refers to confirming that “a unique set of parameter estimates can be found based on the sample covariance matrix $S$ and the theoretical model implied by the population covariance matrix $\Sigma$” (Schumaker & Lomax, 2004, p. 63). Therefore, the model must be identified before further analysis.

For the confirmatory factor model, each observed variable was examined to determine that it was loaded on a certain factor, organizational perspective on HRD, investment in workplace learning, organizational outcomes of workplace learning, and organizational performance. The confirmatory factor analysis was conducted to investigate which variable was loaded to which factor: the factor loadings of top management’s clear vision toward HRD, company’s values for talented people, and top management’s emphasis on talented people on the organizational perspective on HRD; the factor loadings of group-based on-the-job classroom training, group-based off-the-job classroom training, on-the-job training (OJT), and task force team (TFT) project on investment in workplace learning; the factor loadings of employee competence, labor productivity, employee enthusiasm on organizational outcomes of workplace learning; and sales per employee, net profit per employee, and gross margin on organizational performance.

To determine the level of identification, the order condition was assessed. Under the order condition, the number of free parameters to be estimated must be less than or equal to the number of distinct values in the sample covariance matrix $S$. If a model is
either just- or over-identified, then the model is identified (Schumacker & Lomax, 2004). As shown in Table 4.4, the order condition provided that the number of distinct values in the matrix $S$ was equal to 91, while there was a total of 32 free parameters to be estimated.

<table>
<thead>
<tr>
<th>No. of Unique Values in $S$</th>
<th>No. of Free Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P \frac{(P+1)}{2}$</td>
<td>Thirteen factor loadings</td>
</tr>
<tr>
<td>$13 \frac{(13+1)}{2}$</td>
<td>Thirteen measurement error variances</td>
</tr>
<tr>
<td></td>
<td>Zero measurement error covariance or correlations</td>
</tr>
<tr>
<td></td>
<td>Six correlations among the latent variables</td>
</tr>
<tr>
<td>91</td>
<td>32</td>
</tr>
</tbody>
</table>

Note. $P$ refers to the number of variables in the sample covariance matrix.

Table 4.4: Order condition of the confirmatory factor model

According to the order condition, this model was over-identified, since the number of values in $S$, 91, was greater than the number of free parameters, 32. In addition, because the degrees of freedom was positive, 59, ($df = 91 - 32 = 59$) rather than zero or negative, this model was over-identified. Thus, this model was concluded as over-identified.

**Model Estimation**

After solving the identification problem, the parameters of the specified factor model were estimated. The goal of model estimation is to obtain the parameter estimates of the sample covariance matrix $S$ of the observed variables as close as possible to the model implied covariance matrix $\Sigma$ (Schumacker and Lomax, 2004). Table 4.5 shows the maximum likelihood estimates.
The parameter estimates, such as factor loadings, measurement error variances, and correlation of independent variables, were found to be significantly different from zero \((p < .05)\). Additionally, all of the factor loadings were significantly different from zero and had the positive loadings as expected. Moreover, there was sufficient evidence that the latent variables were correlated. The fit of the model is discussed in the following section, model testing.

<table>
<thead>
<tr>
<th>Parameter Estimates</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor Loadings</strong></td>
<td></td>
</tr>
<tr>
<td>Clear vision toward HRD</td>
<td>.84</td>
</tr>
<tr>
<td>Valuing talents</td>
<td>.77</td>
</tr>
<tr>
<td>Emphasis on talented people</td>
<td>.86</td>
</tr>
<tr>
<td>On-the-job classroom training</td>
<td>.77</td>
</tr>
<tr>
<td>Off-the-job classroom training</td>
<td>.62</td>
</tr>
<tr>
<td>OJT</td>
<td>.64</td>
</tr>
<tr>
<td>TFT project</td>
<td>.60</td>
</tr>
<tr>
<td>Employee competence</td>
<td>.86</td>
</tr>
<tr>
<td>Labor productivity</td>
<td>.81</td>
</tr>
<tr>
<td>Employee enthusiasm</td>
<td>.78</td>
</tr>
<tr>
<td>Sales per employee</td>
<td>.79</td>
</tr>
<tr>
<td>Net profit per employee</td>
<td>.88</td>
</tr>
<tr>
<td>Gross margin</td>
<td>.65</td>
</tr>
</tbody>
</table>

Note. The parameter estimates are standardized values. All estimates are significant \((p < .05)\) unless \(ns\) is indicated.

Table 4.5: Initial maximum likelihood estimates of the confirmatory factor model
Table 4.5 Continued

<table>
<thead>
<tr>
<th>Measurement Error Variances</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear vision toward HRD</td>
<td>.29</td>
</tr>
<tr>
<td>Valuing talents</td>
<td>.41</td>
</tr>
<tr>
<td>Emphasis on talented people</td>
<td>.27</td>
</tr>
<tr>
<td>On-the-job classroom training</td>
<td>.40</td>
</tr>
<tr>
<td>Off-the-job classroom training</td>
<td>.61</td>
</tr>
<tr>
<td>OJT</td>
<td>.59</td>
</tr>
<tr>
<td>TFT project</td>
<td>.63</td>
</tr>
<tr>
<td>Employee competence</td>
<td>.26</td>
</tr>
<tr>
<td>Labor productivity</td>
<td>.35</td>
</tr>
<tr>
<td>Employee enthusiasm</td>
<td>.40</td>
</tr>
<tr>
<td>Sales per employee</td>
<td>.38</td>
</tr>
<tr>
<td>Net profit per employee</td>
<td>.23</td>
</tr>
<tr>
<td>Gross margin</td>
<td>.58</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor Correlations</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational perspective on HRD, Investment in</td>
<td>.44</td>
</tr>
<tr>
<td>workplace learning</td>
<td></td>
</tr>
<tr>
<td>Investment in workplace learning, Organizational</td>
<td>.71</td>
</tr>
<tr>
<td>outcomes of workplace learning</td>
<td></td>
</tr>
<tr>
<td>Investment in workplace learning, Organizational</td>
<td>.22</td>
</tr>
<tr>
<td>performance</td>
<td></td>
</tr>
<tr>
<td>Organizational outcomes of workplace learning,</td>
<td>.24</td>
</tr>
<tr>
<td>Organizational performance</td>
<td></td>
</tr>
<tr>
<td>Organizational perspective on HRD, Organizational</td>
<td>.50</td>
</tr>
<tr>
<td>outcomes of workplace learning</td>
<td></td>
</tr>
<tr>
<td>Organizational perspective on HRD, Organizational</td>
<td>.11</td>
</tr>
<tr>
<td>performance</td>
<td></td>
</tr>
</tbody>
</table>

Model Testing

After the parameter estimates were obtained for the confirmatory factor model to determine how well the data fit of the model. The purpose of model testing is to fit the sample data to the specified theoretical model. While a good model fit means that the specified model is supported by the sample data, a poor model fit implies the need for respecification to obtain a better fit since the theoretical model is not supported by the
sample data (Schumaker & Lomax, 2004). As such, the model fit refers to the degree to which the sample data in $S$ fit the theoretical model by comparing $S$ (the sample covariance matrix) and $\Sigma$ (the model implied covariance matrix or the population covariance matrix).

There are several criteria for assessing the fit of the model. The first criterion is a global fit measure, including the non-statistical significance of the chi-square test and the root-mean-square error of approximation (RMSEA) value. A non-statistically significant chi-square value indicates that the sample covariance matrix and the reproduced model-implied covariance matrix are similar. A RMSEA is recognized as one of the fit indices least affected by sample size (Raykov & Marcoulides, 2006). A RMSEA value less than or equal to .05 is considered acceptable (Schumaker & Lomax, 2004). More specifically, it has been suggested that a value of the RMSEA of less than .05 indicates a model is approximate to the data; values between .05 and .08 are indicative of the model being a reasonable approximation; and RMSEA $\geq .10$ represents poor fit (Browne & Cudeck, 1993).

The chi-square index is the fundamental measure used in SEM to indicate how well the specified model represents the covariance matrix among the indicator items, representing the similarity between the observed and estimated covariance matrices (Hair et al., 2005). A statistically significant chi-square ($\chi^2$) signifies whether differences between observed and estimated matrices were due to sampling variations (Hair et al., 2005). In contrast, a nonsignificant $\chi^2$ value indicates that the two matrices are similar, suggesting theoretical model that reproduces the sample variance-covariance relationships in the matrix (Schumaker & Lomax, 2004). Therefore, structural equation
modeling seeks to obtain a nonsignificant chi-square, since a fit of the data and model suggests minimal differences in the fit of the data and model. However, the chi-square measure is largely affected by sample size. As sample size increases when it is generally above 200, the chi-square value tends to represent a significant probability level (Schumaker & Lomax, 2004). In contrast, as sample size decreases when it is generally below 100, the $\chi^2$ is likely to indicate that observed and predicted covariances are similar by showing nonsignificant probability levels (Schumaker & Lomax, 2004). Therefore, additional measures of fit should be considered.

In this study, two other model fit indices for the conceptual model were also employed: model fit indices and model comparison indices. Model fit indices are used to determine the degree to which the sample variance-covariance data fit the structural equation model. The commonly used model fit criteria are chi-square ($\chi^2$), the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), and the root-mean-square residual (RMR) (Schumaker & Lomax, 2004).

As noted, the most fundamental fit index is the $\chi^2$ statistic. The GFI assesses the amount of variance and covariance in an observed model that is predicted by the implied model (Schumaker & Lomax, 2004). Even though there are debates concerning the GFI values greater than .90 and greater than .95 (Hair et al., 2005), GFI values fairly close to 1.00 are considered to represent well-fitting models (Raykov & Marcoulides, 2006). The adjusted goodness-of-fit index (AGFI) refers to the adjusted index based on the degrees of freedom of a model relative to the number of variables (Schumaker & Lomax, 2004). Additionally, RMR was used to compare the fit of values between the sample covariance matrix and the covariance matrix created based on the specified theoretical model.
Since the standardized root mean square residual (SRMR) is commonly used in research, the value of SRMR below .05 was determined to be a good model fit. Additionally, normed fit index (NFI) was included in the model comparison indices. This index was used to compare a proposed model with a null model. NFI close to .95 reflects a good model fit (Schumaker & Lomax, 2004). Table 4.6 summarizes the model fit criteria and a good fit used in this study.

<table>
<thead>
<tr>
<th>Model fit Criteria</th>
<th>A Good Fit</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-square ($\chi^2$)</td>
<td>Close to $\chi^2 = 0$</td>
<td>Model fit</td>
</tr>
<tr>
<td>Root mean squared error of approximation (RMSEA)</td>
<td>Less than .05</td>
<td>Model fit</td>
</tr>
<tr>
<td></td>
<td>At least less than .08</td>
<td>(relatively insensitive to $N$)</td>
</tr>
<tr>
<td>Standardized RMR (SRMR)</td>
<td>Less than .05</td>
<td>Model fit</td>
</tr>
<tr>
<td></td>
<td>At least less than .08</td>
<td></td>
</tr>
<tr>
<td>Goodness of fit (GFI)</td>
<td>Close to .95 (Above .95 is good)</td>
<td>Model fit</td>
</tr>
<tr>
<td></td>
<td>At least more than .90</td>
<td>Model comparison</td>
</tr>
<tr>
<td>Adjusted GFI (AGFI)</td>
<td>Close to .95 (Above .95 is good)</td>
<td>Model fit</td>
</tr>
<tr>
<td></td>
<td>At least more than .90</td>
<td>Model comparison</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Model parsimony</td>
</tr>
<tr>
<td>Normed fit index (NFI)</td>
<td>Close to .95 (Above .95 is good)</td>
<td>Model comparison</td>
</tr>
<tr>
<td></td>
<td>At least more than .90</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.6: Model fit criteria and acceptable fit interpretation

Source: Adapted from Schumaker and Lomax (2004), p. 82.

Table 4.7 presents fit indices for model testing. The Chi-square statistic was equal to 197.79, with 59 degrees of freedom and $p$ value of .00. The $\chi^2$ statistic was significant, which means that the specified confirmatory factor model was not supported by the sample variance-covariance data. In addition, the root-mean-square error of
approximation (RMSEA) was equal to .08, which was higher than the acceptable level of model fit (RMSEA < .05). Similarly, the standardized root mean square residual (SRMR) was .06, higher than the acceptable model fit (SRMR < .05). Moreover, the goodness-of-fit (GFI) index and the adjusted goodness-of-fit index (AGFI) were .93 and .89 respectively, which were below the acceptable range of model fit (GFI, AGFI > .95). Finally, the normed fit index (NFI) was .95, which was acceptable even if it was not above .95 (NFI > .95).

According to the set of model fit indices, the fit of the initial confirmatory factor model was poor. Therefore, some model modifications was determined to be required to achieve a better fitting model.

<table>
<thead>
<tr>
<th>Model fit Indices</th>
<th>Results of Model Fit</th>
<th>Assessments of Model Fit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-square ($\chi^2$)</td>
<td>$\chi^2_{59} = 197.79 (p = .00)$</td>
<td>Poor fit</td>
</tr>
<tr>
<td>Root mean squared error of approximation (RMSEA)</td>
<td>.08</td>
<td>Not acceptable (Not below .05)</td>
</tr>
<tr>
<td>Standardized RMR (SRMR)</td>
<td>.06</td>
<td>Not acceptable (Not below .05)</td>
</tr>
<tr>
<td>Goodness of fit (GFI)</td>
<td>.93</td>
<td>Not acceptable (Not close to or above .95)</td>
</tr>
<tr>
<td>Adjusted GFI (AGFI)</td>
<td>.89</td>
<td>Not acceptable (Not close to or above .95)</td>
</tr>
<tr>
<td>Normed fit index (NFI)</td>
<td>.95</td>
<td>Acceptable (Exactly .95)</td>
</tr>
</tbody>
</table>

Table 4.7: Model testing for the initial confirmatory factor model
Model Modification

Model modification is a final stage in structural equation modeling. Model modification is performed to find a better model by changing the initial model with poor model fit indices (Schumacker & Lomax, 2004). The modification index (MI), the standardized residual matrix, and the expected parameter change (EPC) statistic were considered to change the initial model.

The modification index suggested to add several paths, from investment in workplace learning to gross margin, from organizational outcomes of workplace learning to gross margin. However, the suggested paths from the modification indices were not appropriate in terms of theoretical perspective, so that these paths were not included.

Furthermore, based on the modification indices, error covariances among the observed variables were correlated. The largest modification index was for the measurement error covariance between OJT (on-the-job training) and TFT (task force team project) (MI = 53.0, EPC = .17). Then, a measurement error covariance between OJT (on-the-job training) and TFT (task force team project) was specified.

Other modifications were also conducted for the specifications of a measurement error covariance. These included the following: group-based on-the-job classroom training and group-based off-the-job classroom training (MI = 30.4, EPC = .13); group-based off-the-job classroom training and OJT (MI = 26.5, EPC = -.12); TFT and top management’s clear vision toward HRD (MI = 8.5, EPC = -.05); TFT and top management’s emphasis on talented people (MI = 22.3, EPC = .08); group-based on-the-job classroom training and TFT (MI = 14.2, EPC = -.09); group-based on-the-job classroom training and employee competence (MI = 8.1, EPC = .03); top management’s
clear vision toward HRD and labor productivity (MI = 11.3, EPC = .04); company’s values for talented people and labor productivity (MI = 8.1, EPC = -.03); sales per employee and net profit per employee (MI = 36.4, EPC = .23).

In addition, more new parameters such as the measurement error covariance were added based on the large standardized residuals (greater than 1.96 at p = .05) because those residuals suggest that a certain variable relationship is not well considered in the model (Schumaker & Lomax, 2004). Thus, the standardized residual matrix was examined and the measurement error covariance was further specified for the standardized residual. These values were greater than $t = 1.96$: employee competence and gross margin (4.95), labor productivity and gross margin (3.87), employee enthusiasm and gross margin (3.74), top management’s clear vision toward HRD and top management’s emphasis on talented people (-2.05), top management’s clear vision toward HRD and employee enthusiasm (2.72), and company’s values for talented people and group-based on-the-job classroom training (-2.29). Since several standardized residuals greater than $t = 1.96$ were overlapped with the modification indices for the specifications of a measurement error covariance, standardized residuals which were not included in the modification indices were specified.

Consequently, Table 4.8 provides the respecified maximum likelihood estimates of the confirmatory factor model after model modifications were made. In the respecified model, all of the parameters were significantly different from zero ($p < .05$).
### Parameter Estimates

<table>
<thead>
<tr>
<th>Factor Loadings</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear vision toward HRD</td>
<td>.85</td>
</tr>
<tr>
<td>Valuing talents</td>
<td>.77</td>
</tr>
<tr>
<td>Emphasis on talented people</td>
<td>.87</td>
</tr>
<tr>
<td>On-the-job classroom training</td>
<td>.75</td>
</tr>
<tr>
<td>Off-the-job classroom training</td>
<td>.60</td>
</tr>
<tr>
<td>OJT</td>
<td>.64</td>
</tr>
<tr>
<td>TFT project</td>
<td>.55</td>
</tr>
<tr>
<td>Employee competence</td>
<td>.86</td>
</tr>
<tr>
<td>Labor productivity</td>
<td>.81</td>
</tr>
<tr>
<td>Employee enthusiasm</td>
<td>.78</td>
</tr>
<tr>
<td>Sales per employee</td>
<td>.43</td>
</tr>
<tr>
<td>Net profit per employee</td>
<td>.49</td>
</tr>
<tr>
<td>Gross margin</td>
<td>1.15</td>
</tr>
</tbody>
</table>

### Measurement Error Variances

<table>
<thead>
<tr>
<th>Measurement Error Variances</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear vision toward HRD</td>
<td>.28</td>
</tr>
<tr>
<td>Valuing talents</td>
<td>.41</td>
</tr>
<tr>
<td>Emphasis on talented people</td>
<td>.25</td>
</tr>
<tr>
<td>On-the-job classroom training</td>
<td>.44</td>
</tr>
<tr>
<td>Off-the-job classroom training</td>
<td>.64</td>
</tr>
<tr>
<td>OJT</td>
<td>.59</td>
</tr>
<tr>
<td>TFT project</td>
<td>.70</td>
</tr>
<tr>
<td>Employee competence</td>
<td>.26</td>
</tr>
<tr>
<td>Labor productivity</td>
<td>.35</td>
</tr>
<tr>
<td>Employee enthusiasm</td>
<td>.40</td>
</tr>
<tr>
<td>Sales per employee</td>
<td>.81</td>
</tr>
<tr>
<td>Net profit per employee</td>
<td>.76</td>
</tr>
<tr>
<td>Gross margin</td>
<td>.32 ns</td>
</tr>
</tbody>
</table>

Note. The parameter estimates are standardized values. All estimates are significant ($p < .05$) unless *ns* is indicated.

Table 4.8: Respecified maximum likelihood estimates of the confirmatory factor model
In addition, the results of respecified model testing was shown in Table 4.9. The revised confirmatory factor model revealed a decrease of $\chi^2$ from 197.79 to 44.86, with 44 degrees of freedom and a $p$-value of .44. The Chi-square statistic was nonsignificant, indicating that the sample data in the observed model adequately fit the theoretical model. In addition to the $\chi^2$ value, other measures of fit were considered.

All of the fit indices indicated an acceptable level of fit ($\text{RMSEA} = .03$, $\text{SRMR} = .04$, $\text{GFI} = .97$, $\text{AGFI} = .94$, $\text{NFI} = .98$). A second specification search did not recommend any further changes, so no additional model modifications were performed. Thus, the respecified model was considered as the best fitting confirmatory factor model.
Table 4.9: Model testing for the respecified confirmatory factor model

<table>
<thead>
<tr>
<th>Model Fit Indices</th>
<th>Results of Model Fit</th>
<th>Assessment of Model Fit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-square ($\chi^2$)</td>
<td>$\chi^2_{44} = 44.86 (p = .44)$</td>
<td>Good fit</td>
</tr>
<tr>
<td>Root mean squared error of approximation (RMSEA)</td>
<td>.01</td>
<td>Acceptable (Below .05)</td>
</tr>
<tr>
<td>Standardized RMR (SRMR)</td>
<td>.03</td>
<td>Acceptable (Below .05)</td>
</tr>
<tr>
<td>Goodness of fit (GFI)</td>
<td>.98</td>
<td>Acceptable (Above .95)</td>
</tr>
<tr>
<td>Adjusted GFI (AGFI)</td>
<td>.96</td>
<td>Acceptable (Above .95)</td>
</tr>
<tr>
<td>Normed fit index (NFI)</td>
<td>.99</td>
<td>Acceptable (Above .95)</td>
</tr>
</tbody>
</table>

The Structural Equation Model

The structural equation model involves testing more than one full structural equation simultaneously. In this study, the structural equation model was analyzed, since confirmatory factor model, the analysis of structural equation model was the confirmatory factor analysis confirmed the strong measurement model. Similar to the confirmatory factor analysis, model specification, model identification, model estimation, model testing, and model modification were conducted.

Model Specification

To develop a theoretical model is a first step in analyzing a structural equation model (Schumaker & Lomax, 2004). In the stage of model specification, it is important to find the model that best reproduces the sample covariance matrix $S$ from the true
population model. A structural equation model consists of both a measurement model and a structural equation model.

The structural equation model was diagrammed in Figure 4.2. The model is composed of four latent variables: 1) one latent independent variable, investment in workplace learning, 2) one latent moderating variable, organizational perspective on HRD (HRD perspective), 3) one latent mediating variable, organizational outcomes of workplace learning, and 4) one latent dependent variable, organizational performance.

The measurement models for each latent variable identified which observed variables defined the particular latent variable. The observed variables were displayed using rectangles: 1) investment in workplace learning was defined by four indicators of on-the-job classroom training (OnClTra), off-the-job classroom training (OffClTra), on-the-job training (OJT), and task force team project (TFT); 2) organizational perspective on HRD was defined by three indicators, including top management’s clear vision toward HRD (Vision), company’s values for talented people (Valuing), and top management’s emphasis on talented people (Importa); 3) organizational outcomes of workplace learning was defined by three indicators of employee competence (Compete), labor productivity (Productiv), and employee enthusiasm (Enthusia); and 4) organizational performance was defined by three indicators including sales per employee (Sales), net profit per employee (Nprofit), and gross margin (Margin).

Additionally, each observed variable was depicted as having a unique measurement error. The latent variables of organizational outcomes of workplace learning and organizational performance were also displayed as having prediction errors, which indicate the amount of unexplained variance by the antecedent variable(s).
Organizational perspective on HRD was not included in the analysis of the structural equation model, even though it was depicted in the figure. Rather, organizational perspective on HRD as a latent moderating variable and its indicator variables were analyzed to determine whether it played as a moderator between investment in workplace learning and organizational outcomes of workplace learning.
Figure 4.2: The structural equation model
Model Identification

The identification problem prior to the estimation of parameters should be solved to determine whether the model is identified (Schumaker & Lomax, 2004). More specifically, the model must be identified in terms of the factor loadings, measurement errors, structural coefficients, and prediction errors. As shown in Table 4.10, the model identification was determined by checking the order condition.

As stated, organizational perspective on HRD as a latent moderating variable and its indicator variables were excluded for the model identification, since it was not included in the analysis of the structural equation model. The issue of the moderating role of organizational perspective on HRD will be discussed as part of the moderation effect test section. Therefore, the variable of organizational perspective on HRD was not considered for the order condition. Moreover, four parameters were fixed to resolve the unit of measurement problem, whereas other parameters were free to be estimated.

The order condition showed that there were a total of 22 free parameters in the structural equation model, while the number of distinct values in the matrix $S$ was equal to 55. The number of free parameters to be estimated was less than the number of distinct values in the matrix $S$, so the model was over-identified. Additionally, because the degrees of freedom was positive, 33, $(df = 55 - 22 = 33)$ rather than zero or negative, this model was determined as over-identified.
<table>
<thead>
<tr>
<th>No. of unique values in $S$</th>
<th>No. of free parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P (P+1)/2$</td>
<td>Seven factor loadings (with 3 other factor loadings fixed to 1)</td>
</tr>
<tr>
<td>$10 (10+1)/2$</td>
<td>Ten measurement error variances</td>
</tr>
<tr>
<td></td>
<td>Zero measurement error covariance or correlations</td>
</tr>
<tr>
<td></td>
<td>One latent independent variables variances</td>
</tr>
<tr>
<td></td>
<td>Zero latent independent variable covariance</td>
</tr>
<tr>
<td></td>
<td>Two structure coefficients</td>
</tr>
<tr>
<td></td>
<td>Two prediction error variances</td>
</tr>
<tr>
<td></td>
<td>Zero prediction error covariance</td>
</tr>
</tbody>
</table>

| 55 | 22 |

Note. $P$ refers to the number of variables in the sample covariance matrix.

Table 4.10: Order condition of structural equation model

*Model Estimation*

The estimation of the parameters for the hypothesized structural equation model was performed. The goal of model estimation is to obtain the parameter estimates of sample covariance matrix $S$ of the observed variables as close as possible to the model implied covariance matrix $\Sigma$ (Schumacker and Lomax, 2004). The maximum likelihood estimates for the initial structural equation model were shown in Table 4.11.

All of the parameter estimates were significantly different from zero ($p < .05$). Additionally, 51% ($R^2 = .51$) of organizational outcomes of workplace learning was explained by investment in workplace learning. 6% ($R^2 = .06$) of organizational performance was explained by organizational outcomes of workplace learning. Model testing for the initial structural model will be discussed in the following section.
<table>
<thead>
<tr>
<th>Parameter Estimates</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor Loadings</strong></td>
<td></td>
</tr>
<tr>
<td>On-the-job classroom training</td>
<td>.78</td>
</tr>
<tr>
<td>Off-the-job classroom training</td>
<td>.63</td>
</tr>
<tr>
<td>OJT</td>
<td>.63</td>
</tr>
<tr>
<td>TFT project</td>
<td>.60</td>
</tr>
<tr>
<td>Employee competence</td>
<td>.87</td>
</tr>
<tr>
<td>Labor productivity</td>
<td>.81</td>
</tr>
<tr>
<td>Employee enthusiasm</td>
<td>.77</td>
</tr>
<tr>
<td>Sales per employee</td>
<td>.79</td>
</tr>
<tr>
<td>Net profit per employee</td>
<td>.88</td>
</tr>
<tr>
<td>Gross margin</td>
<td>.65</td>
</tr>
<tr>
<td><strong>Structural Coefficients</strong></td>
<td></td>
</tr>
<tr>
<td>Investment in Workplace Learning → Organizational</td>
<td>.71</td>
</tr>
<tr>
<td>Outcomes of Workplace Learning</td>
<td></td>
</tr>
<tr>
<td>Organizational Outcomes of Workplace Learning → Organizational Performance</td>
<td>.24</td>
</tr>
<tr>
<td><strong>Latent Independent Variables Variances</strong></td>
<td></td>
</tr>
<tr>
<td>Investment in Workplace Learning variance</td>
<td>.39</td>
</tr>
<tr>
<td><strong>Prediction Error Variances</strong></td>
<td></td>
</tr>
<tr>
<td>Organizational Outcomes of Workplace Learning prediction error variance</td>
<td>.49</td>
</tr>
<tr>
<td>Organizational Performance prediction error variance</td>
<td>.94</td>
</tr>
<tr>
<td><strong>Measurement Error Variances</strong></td>
<td></td>
</tr>
<tr>
<td>On-the-job classroom training</td>
<td>.38</td>
</tr>
<tr>
<td>Off-the-job classroom training</td>
<td>.61</td>
</tr>
<tr>
<td>OJT</td>
<td>.60</td>
</tr>
<tr>
<td>TFT project</td>
<td>.65</td>
</tr>
<tr>
<td>Employee competence</td>
<td>.25</td>
</tr>
<tr>
<td>Labor productivity</td>
<td>.35</td>
</tr>
<tr>
<td>Employee enthusiasm</td>
<td>.41</td>
</tr>
<tr>
<td>Sales per employee</td>
<td>.38</td>
</tr>
<tr>
<td>Net profit per employee</td>
<td>.22</td>
</tr>
<tr>
<td>Gross margin</td>
<td>.58</td>
</tr>
</tbody>
</table>

Note. The parameter estimates are standardized values. All estimates are significant ($p < .05$) unless $ns$ is indicated.

Table 4.11: Initial maximum likelihood estimates of structural equation model
Model Testing

Model testing involves how well the data fit the model. The good model fit means that the specified model is supported by the sample data, indicating the minimal difference between \( S \) (the sample covariance matrix) and \( \Sigma \) (the model implied covariance matrix or the population covariance matrix). Several fit indices for the model testing were described in Table 4.12.

The Chi-square statistic was equal to 132.22, with 33 degrees of freedom and \( p \) value of .00. The \( \chi^2 \) statistic was significant, which signifies that the observed model and the implied model were different. In addition, the root-mean-square error of approximation (RMSEA) was equal to .09, which was higher than the acceptable level of model fit (RMSEA < .05). Similarly, the standardized root mean square residual (SRMR) was .07, higher than the acceptable model fit (SRMR < .05). Moreover, the goodness-of-fit (GFI) index and the adjusted goodness-of-fit index (AGFI) were .94 and .90 respectively, which were below the acceptable range of model fit (GFI, AGFI > .95). Finally, the normed fit index (NFI) was .94, which was close to .95 but not above .95 (NFI > .95).

Across the set of model fit indices, the fit of the initial structural equation model was not acceptable. Thus, model modification was attempted to respecify the model to obtain a better fitting model.
<table>
<thead>
<tr>
<th>Model fit Indices</th>
<th>Result of model fit</th>
<th>Assessment of model fit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-square ($\chi^2$)</td>
<td>$\chi^2_{33} = 132.22 , (p = .00)$</td>
<td>Poor fit</td>
</tr>
<tr>
<td>Root mean squared error of approximation (RMSEA)</td>
<td>.09</td>
<td>Not acceptable (Not below .05)</td>
</tr>
<tr>
<td>Standardized RMR (SRMR)</td>
<td>.07</td>
<td>Not acceptable (Not below .05)</td>
</tr>
<tr>
<td>Goodness of fit (GFI)</td>
<td>.94</td>
<td>Not acceptable (Not above .95)</td>
</tr>
<tr>
<td>Adjusted GFI (AGFI)</td>
<td>.90</td>
<td>Not acceptable (Not above .95)</td>
</tr>
<tr>
<td>Normed fit index (NFI)</td>
<td>.94</td>
<td>Barely acceptable (Close to .95 but above .95)</td>
</tr>
</tbody>
</table>

Table 4.12: Model testing for the initial structural equation model

*Model Modification*

If the fit of the implied theoretical model is not as strong as one would like, then the next step is to modify the model and subsequently evaluate the modified model. Respecification of the initial model was conducted using the modification index (MI), the standardized residual matrix, and the expected parameter change (EPC) statistic.

The modification indices suggested to add the path from OUTCO (organizational outcomes of workplace learning) and MARGIN (gross margin) (MI = 32.2, EPC = .37). However, the path was not included since the addition of the new path was not appropriate from the theoretical standpoint. Additionally, the modification indices indicated to specify a number of measurement error covariance. Thus, measurement errors were correlated: sales per employee and net profit per employee (MI = 32.2, EPC = .22); group-based off-the-job classroom training and group-based on-the-job classroom training (MI = 27.6, EPC = .12); group-based off-the-job classroom training and group-based on-the-job classroom training (MI = 27.6, EPC = .12).
training and on-the-job training (MI = 24.9, EPC = -.11); group-based on-the-job classroom training and task force team project (MI = 14.8, EPC = -.09); and on-the-job training and task force team project (MI = 56.5, EPC = .17).

In addition, more parameters were added based on the large standardized residuals for the measurement error covariance. Then, the standardized residual matrix was examined, and the measurement error covariance was specified for the statistically significant standardized residuals \( t > 1.96 \) which had the theoretical supports. For example, a relationship between group-based on-the-job classroom training and gross margin was not specified since the current research was presumed not to have a direct linkage between them, even if a significant standardized residual existed. Additionally, since several residuals were identical with the modification indices, measurement error variances, which were not included in the modification indices, were correlated. Several relationships were specified based on the standardized residuals greater than \( t = 1.96 \) at \( p = .05 \): employee competence and gross margin (4.85); labor productivity and gross margin (3.79); employee enthusiasm and gross margin (3.68).

After the initial model was modified, the respecified model was evaluated. Table 4.13 reports the respecified maximum likelihood estimates of structural equation model. In the respecified model, all of the estimates were significantly different from zero \( (p < .05) \). Additionally, in terms of structural coefficients, all structural paths had significantly positive relationships.

Moreover, the model was improved from the initial model since \( R^2 \) value of organizational outcomes of workplace learning was slightly increased from .51 in initial model to .55 in respecified model, along with \( R^2 \) value increase in the organizational
performance from .06 to .15. That is, in the revised model, 55% of the organizational outcomes of workplace learning were explained by investment in workplace learning. Furthermore, 15% of organizational performance was explained by organizational outcomes of workplace learning.

<table>
<thead>
<tr>
<th>Parameter Estimates</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor Loadings</strong></td>
<td></td>
</tr>
<tr>
<td>On-the-job classroom training</td>
<td>.77</td>
</tr>
<tr>
<td>Off-the-job classroom training</td>
<td>.59</td>
</tr>
<tr>
<td>OJT</td>
<td>.61</td>
</tr>
<tr>
<td>TFT project</td>
<td>.54</td>
</tr>
<tr>
<td>Employee competence</td>
<td>.87</td>
</tr>
<tr>
<td>Labor productivity</td>
<td>.81</td>
</tr>
<tr>
<td>Employee enthusiasm</td>
<td>.76</td>
</tr>
<tr>
<td>Sales per employee</td>
<td>.40</td>
</tr>
<tr>
<td>Net profit per employee</td>
<td>.46</td>
</tr>
<tr>
<td>Gross margin</td>
<td>1.23</td>
</tr>
<tr>
<td><strong>Structural Coefficients</strong></td>
<td></td>
</tr>
<tr>
<td>Investment in Workplace Learning → Organizational</td>
<td>.74</td>
</tr>
<tr>
<td>Outcomes of Workplace Learning</td>
<td></td>
</tr>
<tr>
<td>Organizational Outcomes of Workplace Learning →</td>
<td>.38</td>
</tr>
<tr>
<td>Organizational Performance</td>
<td></td>
</tr>
<tr>
<td><strong>Latent Independent Variables Variances</strong></td>
<td></td>
</tr>
<tr>
<td>Investment in Workplace Learning variance</td>
<td>.38</td>
</tr>
<tr>
<td><strong>Prediction Error Variances</strong></td>
<td></td>
</tr>
<tr>
<td>Organizational Outcomes of Workplace Learning</td>
<td>.45</td>
</tr>
<tr>
<td>prediction error variance</td>
<td></td>
</tr>
<tr>
<td>Organizational Performance prediction error variance</td>
<td>.85</td>
</tr>
</tbody>
</table>

Note. The parameter estimates are standardized values. All estimates are significant ($p < .05$) unless $ns$ is indicated.

Table 4.13: Respecified maximum likelihood estimates of structural equation model
Table 4.13 Continued

<table>
<thead>
<tr>
<th>Measurement Error Variances</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>On-the-job classroom training</td>
<td>.41</td>
</tr>
<tr>
<td>Off-the-job classroom training</td>
<td>.65</td>
</tr>
<tr>
<td>OJT</td>
<td>.63</td>
</tr>
<tr>
<td>TFT project</td>
<td>.70</td>
</tr>
<tr>
<td>Employee competence</td>
<td>.25</td>
</tr>
<tr>
<td>Labor productivity</td>
<td>.35</td>
</tr>
<tr>
<td>Employee enthusiasm</td>
<td>.41</td>
</tr>
<tr>
<td>Sales per employee</td>
<td>.84</td>
</tr>
<tr>
<td>Net profit per employee</td>
<td>.79</td>
</tr>
<tr>
<td>Gross margin</td>
<td>.52 ns</td>
</tr>
</tbody>
</table>

In addition to the respecified maximum likelihood estimates, the results of the respecified model testing are presented in Table 4.14. The revised structural equation model showed a decrease of $\chi^2$ from 132.22 to 25.74, with 25 degrees of freedom and a $p$-value of .42. The Chi-square statistic was significant was nonsignificant, which indicated that the observed model and the implied model were similar. The fit of the Chi-square was acceptable, but other model fit indices were also assessed. All of the model fit indices revealed an acceptable level of fit (RMSEA = .01, SRMR = .02, GFI = .99, AGFI = .97, NFI = .99). No further modifications were recommended. Therefore, the respecified model was considered to be the final best-fitting structural equation model with the sample variance-covariance data.
<table>
<thead>
<tr>
<th>Model fit indices</th>
<th>Result of model fit</th>
<th>Assessment of model fit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-square ($\chi^2$)</td>
<td>$\chi^2_{25} = 25.74$ ($p = .42$)</td>
<td>Good fit</td>
</tr>
<tr>
<td>Root mean squared error of approximation (RMSEA)</td>
<td>$.01$</td>
<td>Acceptable (Below .05)</td>
</tr>
<tr>
<td>Standardized RMR (SRMR)</td>
<td>$.02$</td>
<td>Acceptable (Below .05)</td>
</tr>
<tr>
<td>Goodness of fit (GFI)</td>
<td>$.99$</td>
<td>Acceptable (Above .95)</td>
</tr>
<tr>
<td>Adjusted GFI (AGFI)</td>
<td>$.97$</td>
<td>Acceptable (Close to .95)</td>
</tr>
<tr>
<td>Normed fit index (NFI)</td>
<td>$.99$</td>
<td>Acceptable (Above .95)</td>
</tr>
</tbody>
</table>

Table 4.14: Model testing for the respecified structural equation model

Moderation Effect Test

To examine whether organizational perspective on HRD moderates between investment in workplace learning and organizational outcomes of workplace learning, multiple group structural equation model was conducted, as shown in Figure 4.3. The data were first divided into two groups: 1) low level of organizational perspective on HRD, and 2) high level of organizational perspective on HRD based on the median of values of organizational perspective on HRD. Then, those two groups were tested to see if their measurement models were different. If the measurement models would be different, it can be concluded that two models are different.
Figure 4.3: Testing moderation effect of organizational perspective on HRD
As state, the analysis of the measurement model should be first conducted prior to the structural model to determine the extent to which there is group invariance. Thus, a test was conducted to examine whether specific parameters or sets of parameters are statistically invariant across groups. An analysis of the factor loadings, measurement error variances, and latent variable variances/covariance were conducted to determine whether they were equivalent for the one group with low level of organizational perspective on HRD and the other group with high level of organizational perspective on HRD.

Table 4.15 shows the results of multiple group models focused on confirmatory factor analysis (CFA) for testing the moderation effect of the latent variable, organizational perspective on HRD. The multiple group model for the CFA was conducted based on five procedures; 1) Model A assumed that all parameters of two groups were free, and nothing was invariant; 2) Model B assumed that only factor loadings in the two groups were same; 3) Model C assumed that factor loadings and measurement error variances were invariant in two groups, but latent variable variances/covariance were different; 4) Model D assumed that factor loadings and latent variable variances/covariance were identical in the two groups, but measurement error variances were different; and 5) Model E assumed that all parameters were invariant in the two groups.

As shown in Table 4.15, the first model (Model A) tested was to have all free parameters. Then, testing of the invariance of factor loading where the factor loadings were restricted to be equal across groups (Model B) was tested. A chi-square difference test (Model A - Model B) was used to assess whether or not the factor loadings of the
measurement models were invariant across the two groups. The result of a chi-square difference test was not statistically significant since $\chi^2$ difference of 4.45 with 9 degrees of freedom was less than 16.92 of $\chi^2$ value at $p = .05$. This showed that there was insufficient evidence that the null hypothesis was rejected. Thus, the factor loadings in the two measurement models for the two groups were found to be equivalent.

Subsequently, the invariance of factor loadings and measurement error variances was tested for the two measurement models at Model C. A chi-square difference test (Model B - Model C) was used to assess the significance of the difference of factor loadings and measurement error variances between two groups; the result was statistically significant ($\chi^2$ difference of 103.34 with 13 degrees of freedom was more than 22.36 of $\chi^2$ value at $p = .05$). This indicated that two models were different in terms of the factor loadings and measurement error variances by rejecting the null hypothesis.

Next, the invariance of factor loadings and latent variable variances as well as covariance was tested by Model D. A chi-square difference test (Model B - Model D) was assessed to see if the latent variable variances as well as covariance were equivalent. The significance of a Chi-square difference ($\chi^2$ difference of 33.16 with 10 degrees of freedom was more than 18.31 of $\chi^2$ value at $p = .05$) indicated that two models had different latent variable variances as well as covariance. Finally, Model E tested whether or not all parameters were invariant across the two groups. The Chi-square difference between Model D and Model E was evaluated. The critical value of the Chi-square difference was significant ($\chi^2$ difference of 132.63 with 13 degrees of freedom was more than 22.36 of $\chi^2$ value at $p = .05$), suggesting that the measurement error variances were not identical across the groups.
Overall, the results of testing group invariance across five models showed that two models were statistically identical since the factor loadings between the groups were invariant. The factor loadings are critical to judge whether models are equivalent or different (Schumaker & Lomax, 2004). Thus, the invariance of structure coefficients in the structural model was examined for the two groups, low level of organizational perspective on HRD and high level of organizational perspective on HRD.

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>p-value</th>
<th>$\chi^2$ difference</th>
<th>df difference</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model A (All parameters are free, nothing invariant)</td>
<td>255.55</td>
<td>118</td>
<td>.00</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Model B (Factor loadings invariant)</td>
<td>260.00</td>
<td>127</td>
<td>.00</td>
<td>A-B: 4.45</td>
<td>A-B: 9</td>
<td>Non Sig.</td>
</tr>
<tr>
<td>Model C (Factor loadings &amp; measurement error variances invariant)</td>
<td>363.34</td>
<td>140</td>
<td>.00</td>
<td>B-C: 103.34</td>
<td>B-C: 13</td>
<td>Sig.</td>
</tr>
<tr>
<td>Model D (Factor loading &amp; latent variable variances/covariance invariant)</td>
<td>293.16</td>
<td>137</td>
<td>.00</td>
<td>B-D: 33.16</td>
<td>B-D: 10</td>
<td>Sig.</td>
</tr>
<tr>
<td>Model E (All parameters invariant)</td>
<td>425.79</td>
<td>150</td>
<td>.00</td>
<td>D-E: 132.63</td>
<td>D-E: 13</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

Note. Sig. refers to significant.

Table 4.15: Multiple group model (CFA) for testing moderation effect

Table 4.16 shows the results of multiple group models of structural model analysis for testing whether the structure coefficients of structural models in both two groups, low level of organizational perspective on HRD and high level of organizational perspective on HRD.
perspective on HRD. Because the perspective on HRD was hypothesized to moderate between the investment in workplace learning and organizational outcomes of workplace learning, as shown in Figure 4.3, the invariance of two structural coefficients was investigated for the path. Then, two procedures for structural model analysis were conducted. Model A assumed that all structural coefficients of two groups were free, and nothing was invariant. Model B assumed that only structural coefficient between investment in workplace learning and organizational outcomes of workplace learning were identical.

Table 4.16 showed that the first model (Model A) tested was to have all free parameters in structural paths. Next, testing of the invariance of the path, investment in workplace learning and organizational outcomes of workplace learning, was constrained to be equal across the groups was tested (Model B). A chi-square difference test (Model A - Model B) was used to assess whether or not the structural coefficients of the structural models were invariant across the two groups. The result of a chi-square difference test was not statistically significant, showing that $\chi^2$ difference of 0.20 with 1 degree of freedom was less than 3.84 of $\chi^2$ value at $p = .05$. This showed that the structural coefficients between investment in workplace learning and organizational outcomes of workplace learning were statistically invariant.
<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>p-value</th>
<th>$\chi^2$ difference</th>
<th>df difference</th>
<th>Sig.</th>
</tr>
</thead>
</table>
| Model A  
(All parameters are free, nothing invariant) | 226.94 | 79 | .00 | - | - | - |
| Model B  
(Structural coefficient of investment in workplace learning - organizational outcomes of workplace learning invariant) | 227.14 | 80 | .00 | A-B: .20 | A-B: 1 | Non Sig. |

Note. Sig. refers to significant.

Table 4.16: Multiple group model (structural model) for testing moderation effect

In conclusion, the analyses of the measurement model and structural model showed that organizational perspective on HRD did not moderate either between investment in workplace learning and organizational outcomes of workplace learning. This indicates that there is no difference in the relationship between investment in workplace learning and organizational outcomes of workplace learning under the conditions of low level of organizational perspective on HRD and high level of organizational perspective on HRD.
Multiple Group Models for Industrial Sectors

Multiple group models were conducted to determine the extent to which there was group invariance or group equality of parameter estimates across the two industrial groups (the manufacturing industry and non-manufacturing industry). As multiple group models for testing moderation effect in the previous part, the multiple group models focused on confirmatory factor analysis (CFA) was first performed to determine the extent to which there is group invariance between manufacturing industry and non-manufacturing industry. Therefore, parameters such as factor loadings, measurement error variances, and latent variable variances/covariance were analyzed to examine whether two groups were statistically invariant.

Table 4.17 presents the results of the multiple group models focused on confirmatory factor analysis (CFA) for subgroups of total sample, manufacturing industry and non-manufacturing industry. The analyses of the multiple group model for the CFA was conducted with the same procedures as described in the previous part of moderation effect test. The first model (Model A) tested was to have all free parameters. Then, testing of the invariance of factor loading where the factor loadings were restricted to be equal across groups (Model B) was tested.

A chi-square difference test (Model A - Model B) was used to assess whether or not the factor loadings of the measurement models were invariant across the two industrial sector groups. The result of a chi-square difference test was statistically significant, showing that \( \chi^2 \) difference of 95.62 with 9 degrees of freedom was more than 16.92 of \( \chi^2 \) value at \( p = .05 \). The result showed that there was sufficient evidence that the null hypothesis; that is, the factor loadings in the measurement models for the two groups
were identical was rejected. Therefore, no further analysis for testing invariance between two groups were needed since the testing for the invariance of factor loadings is the first step to determine the invariance among groups.

According to the results, all parameters including factor loadings, measurement error variances, and latent variable variances/covariance were found not to be statistically invariant across two groups \( p < .05 \). The results showed that the measurement models in those two groups, manufacturing industry and non-manufacturing industry, were different. Therefore, no more analysis such as structural analysis was needed, indicating that the structural model should be different because the measurement model is different.

<table>
<thead>
<tr>
<th>Model</th>
<th>( \chi^2 )</th>
<th>df</th>
<th>p-value</th>
<th>( \chi^2 ) difference</th>
<th>df difference</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model A (All parameters are free, nothing invariant)</td>
<td>347.18</td>
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<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Model B (Factor loadings invariant)</td>
<td>251.56</td>
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<td>.00</td>
<td>A-B: 95.62</td>
<td>A-B: 9</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

Note. Sig. refers to significant.

Table 4.17: Multiple group model (CFA) for subgroups based on industrial sectors

Because two models were found to be different, separate analyses for confirmatory factor models and structural equation models were justified for the manufacturing industry group and the non-manufacturing industry group. Similar to the analyses of total sample in the previous section, measurement models through confirmatory factor analysis were first tested prior to testing structural equation models.
Confirmatory Factor Models

Model Specification and Model Identification. Model specification for the confirmatory factor models in both groups, manufacturing industry and non-manufacturing industry, was conducted as the same way of the total sample which was described in Figure 4.1. In addition, models were regarded as over-identified since they were identical with the model for the total sample as shown in Table 4.4. Thus, the parameters of the specified factor model were estimated since the identification problem was solved.

Model Estimation and Model Testing. The maximum likelihood estimates for the subgroups of manufacturing industry and non-manufacturing industry are shown in Table 4.18. The parameter estimates, such as factor loadings, measurement error variances, and correlation of independent variables, were found to be significantly different from zero in the both groups \((p < .05)\). Additionally, all of the factor loadings were significantly different from zero and had the expectedly positive loadings. Moreover, the latent variables were correlated.

After the parameter estimates were obtained for the confirmatory factor model, how well the data fit the model was determined. Several fit indices for the model testing were reported in the bottom of Table 4.18. For the manufacturing industry, the chi-square statistic was equal to 154.63, with 59 degrees of freedom and \(p\) value of .00. The \(\chi^2\) statistic was significant, which means that the specified confirmatory factor model was not supported by the sample variance-covariance data. In addition, the root-mean-square error of approximation (RMSEA) was equal to .08, which was higher than the acceptable level of model fit (RMSEA < .05). Similarly, the standardized root mean square residual
(SRMR) was .06, higher than the acceptable model fit (SRMR < .05). The goodness-of-fit (GFI) index and the adjusted goodness-of-fit index (AGFI) were .92 and .88 respectively, which were below the acceptable range of model fit (GFI, AGFI > .95).

Finally, the normed fit index (NFI) was .94, which was close to .95 but was not above .95 (NFI > .95). Across the model fit indices, the fit of the initial confirmatory factor model for the manufacturing industry group was poor.

For the non-manufacturing industry, the chi-square statistic was equal to 81.44, with 59 degrees of freedom and p value of .03. The $\chi^2$ statistic was significant, which indicates that sample covariance matrix and model implied matrix were not similar. In addition, the root-mean-square error of approximation (RMSEA) was equal to .06, which was higher than the acceptable level of model fit (RMSEA < .05). Similarly, the standardized root mean square residual (SRMR) was .07, higher than the acceptable model fit (SRMR < .05). The goodness-of-fit (GFI) index and the adjusted goodness-of-fit index (AGFI) were .90 and .85 respectively, which were below the acceptable range of model fit (GFI, AGFI > .95). Finally, the normed fit index (NFI) was .93, which was not above .95 (NFI > .95). According to the set of model fit indices, the fit of the initial confirmatory factor model for the non-manufacturing industry group was not acceptable. Therefore, some modifications for achieving a better fitting model were performed for both models.
## Parameter Estimates

### Manufacturing  |  Non-manufacturing
---|---|---|---

**Factor Loadings**
- Clear vision toward HRD | .83 | .86
- Valuing talents | .78 | .74
- Emphasis on talented people | .86 | .87
- On-the-job classroom training | .75 | .81
- Off-the-job classroom training | .61 | .63
- OJT | .67 | .60
- TFT project | .65 | .54
- Employee competence | .82 | .91
- Labor productivity | .79 | .84
- Employee enthusiasm | .78 | .78
- Sales per employee | .76 | .85
- Net profit per employee | .83 | .91
- Gross margin | .65 | .69

**Measurement Error Variances**
- Clear vision toward HRD | .32 | .26
- Valuing talents | .39 | .46
- Emphasis on talented people | .27 | .25
- On-the-job classroom training | .44 | .35
- Off-the-job classroom training | .63 | .60
- OJT | .56 | .64
- TFT project | .58 | .70
- Employee competence | .32 | .17
- Labor productivity | .37 | .30
- Employee enthusiasm | .40 | .39
- Sales per employee | .42 | .28
- Net profit per employee | .30 | .17
- Gross margin | .58 | .53

Continued

Note. The parameter estimates are standardized values. All estimates are significant ($p < .05$) unless $ns$ is indicated.

Table 4.18: Initial maximum likelihood estimates of confirmatory factor model by subgroups
Table 4.18 Continued

<table>
<thead>
<tr>
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<tr>
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<table>
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<td>.85</td>
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<tr>
<td>NFI</td>
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<td>.93</td>
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</table>

*Model Modification.* Model modifications for both groups were performed to find a better model. The modification index (MI), the standardized residual matrix, and the expected parameter change (EPC) statistic were considered to change the initial model. Model modifications were performed for the both industrial groups.

For the manufacturing industry, the modification index suggested to add the paths, from investment in workplace learning to gross margin, from organizational outcomes of workplace learning to gross margin. However, the suggested paths from the
modification indices were not added since theoretical perspectives based on the review of literature did not support the justifications of adding the paths. As an instance, investment in workplace learning was focused on employees’ various learning activities, so that the factor loading of gross margin on investment in workplace learning was not appropriate. Thus, the path between investment in workplace learning and gross margin was not added.

Additionally, the modification indices suggested that a number of measurement error covariance among observed variables should be specified. For example, the largest modification index was for the measurement error covariance between OnClTra (group-based on-the-job classroom training) and OffClTra (group-based off-the-job classroom training) (MI = 33.2, EPC = .14). Then, a measurement error variance between OnClTra (group-based on-the-job classroom training) and OffClTra (group-based off-the-job classroom training) was correlated since the relationship was justified in terms of theoretical perspectives; two training learning methods can be related by influencing each other. Another instance of the modification suggestion was to specify a measurement error covariance between OffClTra (group-based off-the-job classroom training) and OJT (on-the-job training) (MI = 22.4, EPC = -.12).

Other modifications were also conducted for the specifications of a measurement error covariance: top management’s emphasis on talented people and task force team project (MI = 13.6, EPC = .07); group-based on-the-job classroom training and task force team project (MI = 13.7, EPC = -.11); on-the-job training and task force team project (MI = 32.7, EPC = .17); net profit per employee and sales per employee (MI = 16.6, EPC = .12); labor productivity and top management’s clear vision toward HRD (MI = 8.7,
EPC = .04); and labor productivity and company’s values for talented people (MI = 8.1, EPC = -.04).

Moreover, new parameters on the measurement error covariance were further specified based on the large standardized residuals (greater than 1.96 at p = .05) because those residuals represent that a certain variable relationship is not well considered in the model (Schumaker & Lomax, 2004). Thus, the standardized residual matrix was examined, and the measurement error covariance was specified for the statistically significant standardized residuals (t > 1.96) which had the substantive reasons. On the basis of the standardized residual matrix, several specifications for the measurement error covariance were made: employee enthusiasm and gross margin (2.88), group-based on-the-job classroom training and employee competence (2.38), group-based on-the-job classroom training and labor productivity (-2.12), and employee competence and employee enthusiasm (-2.04).

For the non-manufacturing industry, the modification index suggested to add the paths, from investment on workplace learning to gross margin, from organizational outcomes of workplace learning to gross margin. However, the suggested paths from the modification indices were added since they were not adequate in terms of theoretical perspectives. For example, in the case of organizational outcomes of workplace learning, they were focused on non-financial performance. Then, gross margin was not loaded on organizational outcomes of workplace learning since gross margin was a financial performance indicator.

In addition, according to the modification indices, a number of error variances among observed variables were correlated. A measurement error covariance between on-
the-job training and task force team project (MI = 15.6, EPC = .14) was specified, along with the relationship between net profit per employee and sales per employee (MI = 12.5, EPC = .37). Furthermore, A measurement error variances were also correlated between task force team project and top management’s emphasis on talented people (MI = 15.6, EPC = .14), employee competence and top management’s clear vision toward HRD (MI = 9.4, EPC = -.06), and employee competence and top management’s emphasis on talented people (MI = 9.4, EPC = .05)

Moreover, new parameters such as the measurement error covariance were added based on the large standardized residuals (greater than 1.96 at \( p = .05 \)) because those residuals represent that a certain variable relationship is not well considered in the model (Schumaker & Lomax, 2004). Thus, the standardized residual matrix was examined, and the measurement error covariance was further specified for the standardized residual which was greater than \( t = 1.96 \): employee competence and gross margin (4.14), labor productivity and gross margin (2.64), and task force team project and employee competence (-2.61).

Consequently, maximum likelihood estimates of confirmatory factor model were respecified for the manufacturing industry group and for the non-manufacturing industry group, as shown in Table 4.19. In the respecified model, most parameters were significantly different from zero \( (p < .05) \), except several parameters in non-manufacturing industrial group. The result of respecified model testing was also shown in the bottom of Table 4.19.

For the manufacturing industry, the revised confirmatory factor model revealed the decrease of \( \chi^2 \) from 154.63 to 51.13, with 47 degrees of freedom and a \( p \)-value of .32.
The chi-square statistic was nonsignificant since the $p$-value was greater than .05, which indicated that the sample data in the observed model adequately fit the theoretical model. To further assess the model fit, additional measures of fit were also considered. All selected model fit indices indicated an acceptable level of fit ($\text{RMSEA} = .02$, $\text{SRMR} = .03$, $\text{GFI} = .97$, $\text{AGFI} = .95$, $\text{NFI} = .98$). A second specification search did not recommend any further changes, so no additional model modifications were performed.

For the non-manufacturing industry, the revised confirmatory factor model revealed the decrease of $\chi^2$ from 81.44 to 48.00, with 52 degrees of freedom and a $p$-value of .63. The chi-square statistic was nonsignificant, indicating that the sample data in the observed model adequately fit the theoretical model. In addition, the root-mean-square error of approximation (RMSEA) was equal to .00, which was acceptable since it was less than .05. The standardized root mean square residual (SRMR) was .06, slightly higher than the acceptable model fit (SRMR < .05). The goodness-of-fit (GFI) index and the adjusted goodness-of-fit index (AGFI) were .94 and .90 respectively, which were below the acceptable range of model fit (GFI, AGFI > .95). Finally, the normed fit index (NFI) was .96, which was in the acceptable range (NFI > .95). Overall, several model fit indices such as GFI, and AGFI did not show good fits, but all model fit indices were improved in the respecified model when compared to the initial model. Thus, the respecified model was considered as the best fitting confirmatory factor model.
### Parameter Estimates

<table>
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<tr>
<th>Factor Loadings</th>
<th>Manufacturing</th>
<th>Non-manufacturing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear vision toward HRD</td>
<td>.82</td>
<td>.87</td>
</tr>
<tr>
<td>Valuing talents</td>
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<td>Emphasis on talented people</td>
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<td>.86</td>
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<td>On-the-job classroom training</td>
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<td>Labor productivity</td>
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<tr>
<td>Employee enthusiasm</td>
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<td>Sales per employee</td>
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<td>Net profit per employee</td>
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<tr>
<td>Gross margin</td>
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### Measurement Error Variances

<table>
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<tr>
<th>Factor Loadings</th>
<th>Manufacturing</th>
<th>Non-manufacturing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear vision toward HRD</td>
<td>.32</td>
<td>.25</td>
</tr>
<tr>
<td>Valuing talents</td>
<td>.38</td>
<td>.45</td>
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<tr>
<td>Emphasis on talented people</td>
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<td>.26</td>
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<td>On-the-job classroom training</td>
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<td>Gross margin</td>
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<td><strong>19 ns</strong></td>
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Note. The parameter estimates are standardized values. All estimates are significant (p < .05) unless ns is indicated.

Table 4.19: Respecified maximum likelihood estimates of confirmatory factor model by subgroups
Table 4.19 Continued

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<td>Organizational perspective on HRD, Organizational performance</td>
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<td>.12 ns</td>
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</table>

<table>
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<tr>
<td>NFI</td>
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**Structural Equation Models**

*Model Specification and Model Identification.* Similar to the confirmatory factor model, the structural equation model was analyzed in terms of the model specification, model identification, model estimation, model testing, and model modification. Specified structural equation models for both manufacturing industrial group and non-manufacturing industrial group was identical with the model in Figure 4.2. The order condition showed that both models were over-identified as indicated in Table 4.10.
Therefore, the estimation of the parameters for the hypothesized structural equation models for those two groups was analyzed.

*Model Estimation and Model Testing.* All of the parameter estimates were significantly different from zero ($p < .05$). Additionally, for the manufacturing industry, $52\%$ ($R^2 = .52$) of organizational outcomes of workplace learning was explained by investment in workplace learning. $8.0\%$ ($R^2 = .08$) of organizational performance was explained by organizational outcomes of workplace learning. For the non-manufacturing industry, $50\%$ ($R^2 = .50$) of organizational outcomes of workplace learning was explained by investment in workplace learning. $4.9\%$ ($R^2 = .049$) of organizational performance was explained by organizational outcomes of workplace learning.

Model testing was conducted to examine how well the data fit the model. Several fit indices for the model testing were described in the bottom of Table 4.20. For the manufacturing industry, the Chi-square statistic was equal to 102.60, with 33 degrees of freedom and $p$ value of .00. The $\chi^2$ statistic was significant, which signifies that the observed model and the implied model were different. The root-mean-square error of approximation (RMSEA) was equal to .09, which was higher than the acceptable level of model fit (RMSEA < .05). The standardized root mean square residual (SRMR) was .07, higher than the acceptable model fit (SRMR < .05). Moreover, the goodness-of-fit (GFI) index and the adjusted goodness-of-fit index (AGFI) were .93 and .89 respectively, which were below the acceptable level of model fit (GFI, AGFI > .95). Finally, the normed fit index (NFI) was .94, which was close to .95 but not above .95 (NFI > .95).

For the non-manufacturing industry, the chi-square statistic was equal to 46.24, with 33 degrees of freedom and $p$ value of .06. The $\chi^2$ statistic was nonsignificant at $p$
= .05, which signifies that the observed model and the implied model were similar. The 
fit of the chi-square was acceptable, but other model fit indices were also assessed. The 
root-mean-square error of approximation (RMSEA) was equal to .06, which was not 
acceptable level of model fit (RMSEA < .05). The standardized root mean square residual 
(SRMR) was .08, higher than the acceptable model fit (SRMR < .05). Moreover, the 
goodness-of-fit (GFI) index and the adjusted goodness-of-fit index (AGFI) were .93 
and .88 respectively, which were below the acceptable level of model fit (GFI, AGFI 
> .95). Finally, the normed fit index (NFI) was .94, which was not acceptable model fit 
(NFI > .95). On the basis of the set of model fit indices, the fit of the initial structural 
equation models for the both groups were not acceptable. Thus, model modification was 
attempted to respecify the model to achieve better fitting models.
<table>
<thead>
<tr>
<th>Parameter Estimates</th>
<th>Manufacturing</th>
<th>Non-manufacturing</th>
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<td><strong>Factor Loadings</strong></td>
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Note. The parameter estimates are standardized values. All estimates are significant \(p < .05\) unless \(ns\) is indicated.

Table 4.20: Initial maximum likelihood estimates of structural equation models by subgroups
Table 4.20 Continued

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<td>On-the-job classroom training</td>
<td>.43</td>
<td>.33</td>
</tr>
<tr>
<td>Off-the-job classroom training</td>
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<td>.59</td>
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<tr>
<td>TFT project</td>
<td>.59</td>
<td>.72</td>
</tr>
<tr>
<td>Employee competence</td>
<td>.30</td>
<td>.17</td>
</tr>
<tr>
<td>Labor productivity</td>
<td>.38</td>
<td>.30</td>
</tr>
<tr>
<td>Employee enthusiasm</td>
<td>.42</td>
<td>.40</td>
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<td>Sales per employee</td>
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<tr>
<td>Gross margin</td>
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<td>.53</td>
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</table>

<table>
<thead>
<tr>
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<tbody>
<tr>
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<td>GFI</td>
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<td>AGFI</td>
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<td>.88</td>
</tr>
<tr>
<td>NFI</td>
<td>.94</td>
<td>.94</td>
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</table>

Model Modification. Initial Structural Equation Models for the manufacturing and non-manufacturing industries were adjusted based on the modification index (MI), the standardized residual matrix, and the expected parameter change (EPC) statistic. Model modifications were performed for the both industrial groups.

For the manufacturing industry, the modification index suggested to add one path from organizational outcomes of workplace learning to gross margin (e.g., MI = 14.6, EPC = .32). However, the suggested path was not included because a factor loading of gross margin on organizational outcomes of workplace learning was not supported by
a theoretical aspect. That is, organizational outcomes of workplace learning focus on non-financial performance, whereas gross margin is financial performance indicator.

Additionally, the modification indices suggested a number of measurement error covariance among observed variables were specified. For example, the largest modification index was for the measurement error covariance between OJT and TFT (MI = 34.5, EPC = .17). Then, a measurement error variance between OJT and TFT was correlated since the relationship can be associated. Another instance of the modification suggestion was to specify a measurement error covariance between SALES (sales per employee) and PROFIT (net profit per employee) (MI = 14.6, EPC = .11).

Other modifications were also conducted for the specifications of a measurement error covariance: group-based on-the-job classroom training and group-based off-the-job classroom training (MI = 32.9, EPC = .15); group-based off-the-job classroom training and on-the-job training (MI = 21.9, EPC = -.12); and group-based on-the-job classroom training and task force team project (MI = 14.3, EPC = -.11).

Moreover, new parameters such as the measurement error covariance were further specified based on the large standardized residuals (greater than 1.96 at \( p = .05 \)) because those residuals represent that a certain variable relationship is not well considered in the model (Schumaker & Lomax, 2004). Thus, the standardized residual matrix was examined, and the measurement error covariance was specified for the statistically significant standardized residuals (\( t > 1.96 \)) which were supported by a theoretical standpoint. Since several error variances based on the standardized residuals were identical with those suggested by the modification indices, an error covariance which was not suggested in the modification indices was correlated. Then, the
specifications for the measurement error covariance were made for the relationship:
between employee enthusiasm and gross margin (2.84), between group-based on-the-job
classroom training and employee competence (2.21), and between group-based on-the-
job classroom training and labor productivity (-2.24).

For the non-manufacturing industry, the modification index suggested to add
one path from organizational outcomes of workplace learning to gross margin (e.g., MI =
15.0, EPC = .40). However, the suggested path was not added because it was not
appropriate in terms of the theoretical perspective. Additionally, based on the
modification indices, a measurement error covariance for on-the-job training and task
force team project was specified (MI = 16.8, EPC = .14). Moreover, the standardized
residual matrix was examined, and the measurement error covariance was specified for
the statistically significant standardized residuals (t > 1.96) which had the sufficiently
substantive reasons. The specification for the measurement error covariance was made
between gross margin and labor productivity (2.59).

After the structural equation models for the both manufacturing and non-
manufacturing industries were revised, the models were evaluated. The respecified
maximum likelihood estimates of structural equation models for those both groups were
reported in Table 4.21. In the respecified model, all of the estimates were significantly
different from zero (p < .05).

With respect to $R^2$ values of manufacturing industry, the respecified model was
improved from the initial model. The $R^2$ value of organizational outcomes of workplace
learning was improved from .52 in the initial model to .57 in the respecified model. The
result indicated that 57% of the organizational outcomes of workplace learning were
explained by investment in workplace learning. Additionally, the $R^2$ value of organizational performance was increased from .08 for the initial model to .13 for the respecified model. For the non-manufacturing industry, $R^2$ value of organizational outcomes of workplace learning in the respecified model was slightly changed from .50 in the initial model to .51. However, $R^2$ value of organizational performance was identical as .049 in the initial and respecified models. Those results required to examine other model fit indices to determine the fit of model.

As shown in the bottom of Table 4.21, the results of respecified model testing were described for the both groups. For the manufacturing industry, the revised structural equation model showed $\chi^2$ of 34.75 with 25 degrees of freedom and a $p$-value of .09, indicating that $\chi^2$ was decreased from 102.60 in the initial model. The chi-square statistic (.09 at $p = .05$) was not significant, indicating the sample data in the observed model adequately fit the theoretical model. In addition, other model fit indices were assessed. Most model fit indices showed an acceptable level of fit ($\text{RMSEA} = .04$, $\text{SRMR} = .03$, $\text{GFI} = .98$, $\text{AGFI} = .95$, $\text{NFI} = .98$). Thus, the respecified model was considered to be the final best-fitting structural equation model with the sample variance-covariance data; no further modifications were attempted.

For the non-manufacturing industry, the revised structural equation model showed $\chi^2$ of 31.19 with 31 degrees of freedom and a $p$-value of .46. The chi-square statistic was nonsignificant since the $p$-value was above .05, which indicated that the sample covariance matrix in the observed model sufficiently fit the model implied matrix in the theoretical model. Additionally, other model fit indices were considered for model testing. Several model fit indices showed an acceptable level of fit ($\text{RMSEA} = .01$, $\text{GFI} = .98$).
= .95, NFI = .96), but others did not indicate a satisfactorily acceptable level of fit (SRMR = .07, AGFI = .91). However, the overall goodness-of-fit indices for the non-manufacturing model suggested an acceptable model fit. Therefore, no further modifications were performed.

<table>
<thead>
<tr>
<th>Parameter Estimates</th>
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<td><strong>Structural Coefficients</strong></td>
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<td>.72</td>
</tr>
<tr>
<td>Organizational Outcomes of Workplace Learning</td>
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<td></td>
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<tr>
<td>Organizational Outcomes of Workplace Learning →</td>
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<tr>
<td>Organizational Performance</td>
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<tr>
<td>Latent Independent Variables Variances</td>
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<tr>
<td>Investment in Workplace Learning variance</td>
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<td>.41</td>
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Note. The parameter estimates are standardized values. All estimates are significant (p < .05) unless ns is indicated.

Table 4.21: Respecified maximum likelihood estimates of structural equation models by subgroups
Table 4.21 Continued

<table>
<thead>
<tr>
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<td>.49</td>
</tr>
<tr>
<td>Learning prediction error variance</td>
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<td></td>
</tr>
<tr>
<td>Organizational Performance prediction error variance</td>
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<td>.95</td>
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<table>
<thead>
<tr>
<th>Measurement Error Variances</th>
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<th></th>
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</thead>
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<td>Off-the-job classroom training</td>
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<td>OJT</td>
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<td>.72</td>
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<td>TFT project</td>
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<td>.78</td>
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<tr>
<td>Employee competence</td>
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<td>Labor productivity</td>
<td>.37</td>
<td>.30</td>
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<tr>
<td>Employee enthusiasm</td>
<td>.41</td>
<td>.39</td>
</tr>
<tr>
<td>Sales per employee</td>
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<td>.28</td>
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<td>Net profit per employee</td>
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<td>.16</td>
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<td>Gross margin</td>
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**Goodness-of-fit indices:**

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<th></th>
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<th>df</th>
<th>p value</th>
<th>RMSEA</th>
<th>SRMR</th>
<th>GFI</th>
<th>AGFI</th>
<th>NFI</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>34.75</td>
<td>25</td>
<td>.09</td>
<td>.04</td>
<td>.03</td>
<td>.98</td>
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<td>.98</td>
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<td>.46</td>
<td>.01</td>
<td>.07</td>
<td>.95</td>
<td>.91</td>
<td>.96</td>
</tr>
</tbody>
</table>

Mediation Effect Test

To assess the mediating role of employee outcomes of workplace learning, effect decomposition was performed by analyzing the total effect, direct effect, and indirect effect between variables. Table 4.22 shows the standardized effects of both the investment in workplace learning on organizational performance and the investment in workplace learning and organizational performance.

For the path between investment in workplace learning and organizational
performance, the direct effect was not found. Therefore, the investment in workplace learning influences organizational performance only through organizational outcomes of workplace learning. Organizational outcomes of workplace learning were found to mediate between investment in workplace learning and organizational performance.

<table>
<thead>
<tr>
<th>Path</th>
<th>Total Effect</th>
<th>Direct Effect</th>
<th>Indirect Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment in Workplace Learning → OP</td>
<td>.29</td>
<td>-</td>
<td>.29</td>
</tr>
</tbody>
</table>

Note. The parameter estimates are standardized values. All estimates are significant ($p < .05$) unless $ns$ is indicated.

Table 4.22: Effect decomposition for examining mediation of organizational outcomes of workplace learning

Results for Each Research Question

This section discusses the results for each research question. As this study seeks to analyze the data for the total sample as well as its subgroups based on the industrial sector, the final results of the maximum likelihood estimates of the confirmatory factor model (Table 4.23) and the structural equation model (Table 4.24) are comprehensively provided for the total sample, manufacturing industrial group, and non-manufacturing industrial group. The results of the final structural equation model are also diagrammed in Figure 4.4.
Research Question 1: What is the relationship between investment in workplace learning and organizational outcomes of workplace learning?

Research Question 1 was examined by analyzing the parameter estimates by the structural equation model. As shown in Table 4.24 and Figure 4.4, the structural coefficient for the total sample between investment in workplace learning and organizational outcomes of workplace learning was .74. The parameter estimates for the path between investment in workplace learning and organizational outcomes of workplace learning was statistically significant at $p < .05$.

Therefore, there was a significantly positive relationship between investment in workplace learning and organizational outcomes of workplace learning. The findings show that the more organizations invest in employees’ workplace learning, the more organizational outcomes in workplace learning they are likely to have, such as employee competence, labor productivity, and employee enthusiasm.

Research Question 2: Does organizational perspective on HRD moderate between investment in workplace learning and organizational outcomes of workplace learning?

In order to answer Research Question 2, the multiple-group structural equation modeling was conducted to determine the extent to which there was group invariance of parameter estimates across two groups, low level of organizational perspective on HRD and high level of organizational perspective on HRD. To assess the moderating influence of organizational perspective on HRD, the data for the total sample were divided into two groups based on the median. Then, the groups were tested to determine whether their measurement models were different.
As shown in Table 4.15, the results of testing group invariance across five models showed that two models were statistically identical, since the factor loadings between the groups were invariant. The factor loadings are critical to judge the invariance between models (Schumaker & Lomax, 2004). Thus, the invariance of structure coefficients in the structural model was tested for examining the structure coefficients of structural models in both groups, low level of organizational perspective on HRD and high level of organizational perspective on HRD, as shown in Table 4.16.

The analyses of the measurement model and structural model showed no difference in the relationship between investment in workplace learning and organizational outcomes of workplace learning under the conditions of low level of organizational perspective on HRD and high level of organizational perspective on HRD. Therefore, organizational perspective on HRD did not moderate between investment in workplace learning and organizational outcomes of workplace learning.

*Research Question 3: Do organizational outcomes of workplace learning mediate between investment in workplace learning and organizational performance?*

Investment in workplace learning was found to influence organizational performance through organizational outcomes of workplace learning. The results showed that investment in workplace learning indirectly affected organizational performance. Therefore, organizational outcomes of workplace learning were found to mediate the relationship between investment in workplace learning and organizational performance.
Research Question 4: What is the relationship between organizational outcomes of workplace learning and organizational performance?

Research Question 4 was examined by analyzing the parameter estimates by the structural equation model. As shown in Table 4.24 and Figure 4.4, the structural coefficient between organizational outcomes of workplace learning and organizational performance was .38. The parameter estimates for the path between organizational outcomes of workplace learning and organizational performance was statistically significant at $p < .05$.

Therefore, there was a significantly positive relationship between investment in workplace learning and organizational outcomes of workplace learning. That is, as organizational outcomes of workplace learning including employee competence, labor productivity, and employee enthusiasm are increased, organizational performance including sales per employee, net profit per employee, and gross margin is also increased.

Research Question 5: Are manufacturing industry and non-manufacturing industry groups different in terms of the fit of the measurement model and the structural equation model?

In order to answer Research Question 5, the multiple-group structural equation modeling was conducted to determine the extent to which there was group invariance of parameter estimates across the two groups, the manufacturing industry and the non-manufacturing industry. The multiple group models were analyzed using the confirmatory factor analysis (CFA) to determine the extent to which there is group invariance between the two groups. Therefore, parameters (such as factor loadings,
measurement error variances, and latent variable variances/covariances) were analyzed to examine whether the two groups were statistically invariant.

As shown in Table 4.17, the results of testing group invariance across five models showed that all parameters (including factor loadings, measurement error variances, and latent variable variances/covariances) were not statistically invariant across the two industrial groups. This indicated that the measurement models in those two groups, the manufacturing industry and the non-manufacturing industry, were different. Because different measurement models implied having different structural models, no further analysis for the structural model was continued. Then, the structural coefficients were analyzed separately for the two industries to examine whether there were any differences among different paths.

There was a difference in terms of the fit in the measurement model and structural equation model in the manufacturing industry versus the non-manufacturing industry. In other words, there was no group invariance or equality of parameter estimates across the manufacturing- and non-manufacturing industry. The measurement model and structural equation model fit both industries. Additionally, the multiple group analysis showed that none of the parameter estimates was equivalent across groups. This finding justifies the use of a single group model for each industrial group separately.

As shown in Table 4.21, when examining two industrial models, all structural coefficients were significantly different from zero ($p < .05$). With respect to the relationship between investment in workplace learning and organizational outcomes of workplace learning, both groups had significantly positive relationships at .05. These results indicated that organizational outcomes of workplace learning tend to increase, as
organizations increase their investment in workplace learning in both manufacturing and non-manufacturing industries. However, the values in magnitude were slightly different; the influence of investment in workplace learning on organizational outcomes of workplace learning in the manufacturing industry (.76, p < .05) was slightly greater than that in the non-manufacturing industry (.72, p < .05). Thus, organizations which invest in employee learning are likely to have successful outcomes in terms of employee competence, labor productivity, and employee enthusiasm.

In the path between organizational outcomes of workplace learning and organizational performance, both the manufacturing- and non-manufacturing industry had positive relationships. For the magnitudes in the path, the two industries showed slightly different magnitudes. Organizational outcomes of workplace learning influenced the organizational financial performance (such as sales per employee, net profit per employee, and gross margin) in the manufacturing- (.36, p < .05) and in the non-manufacturing (.22, p < .05) industry. When comparing the magnitude of the parameter estimates for both groups, the manufacturing industry showed a slightly higher magnitude than the manufacturing industry. Based on these findings, we conclude that the better workplace learning outcomes focusing on non-financial performance can lead to greater organizational financial results in both manufacturing and non-manufacturing industries.

When summarizing the structural equation models for both groups, the significance, direction, and magnitude were similar in structural coefficients. In other words, as organizations increase their investment in workplace learning, they are more likely to have successful outcomes including such as employee competence, labor productivity, and employee enthusiasm for both industrial groups. Moreover, as
organizations in both groups have better outcomes of workplace learning, their financial performance is likely to increase, as well.
### Table 4.23: Final maximum likelihood estimates of confirmatory factor models by groups

<table>
<thead>
<tr>
<th>Observed Var.</th>
<th>Latent Var.</th>
<th>Total</th>
<th>Manufacturing</th>
<th>Non-manufacturing</th>
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<tbody>
<tr>
<td>Clear vision toward HRD</td>
<td>Org. Persp.</td>
<td>.85</td>
<td>.82</td>
<td>.87</td>
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<tr>
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<td>HRD</td>
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<td></td>
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</tr>
<tr>
<td>Emphasis on talented people</td>
<td>Org. Persp.</td>
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<td>.79</td>
<td>.74</td>
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Note. The parameter estimates are standardized values. All estimates are significant ($p < .05$) unless ns is indicated.
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<td>Organizational performance</td>
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<td>NFI</td>
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</table>
Note. The values outside the parentheses are for the total sample, while those inside the parentheses are for industrial sectors (the first one is the manufacturing industry and the latter is the non-manufacturing industry). The parameter estimates in this figure are standardized values. All estimates are significant ($p < .05$) unless $ns$ is indicated.

Figure 4.4: Final structural equation model results by groups
CHAPTER 5

SUMMARY, DISCUSSION, AND IMPLICATIONS

This chapter consists of three sections. The first section summarizes the results of the study. The second section discusses the results. The final section presents implications for human resource development research and practice.

Summary of Results

The following is a summary of the results of the study:

- RQ 1. There was a significantly positive relationship between investment in workplace learning and organizational outcomes of workplace learning. As organizations increase their investment in workplace learning, the organizational outcomes of workplace learning such as employee competence, labor productivity, and employee enthusiasm are increased.

- RQ 2. Organizational perspective on HRD did not moderate between investment in workplace learning and organizational outcomes of workplace learning. In other words, the relationship between investment in workplace learning and organizational outcomes of workplace learning was the same in both groups (low level of organizational value in HRD and high level of organizational value in HRD).
• RQ 3. Organizational outcomes of workplace learning mediated between investment in workplace learning and organizational performance.

• RQ 4. There was a significantly positive relationship between organizational outcomes of workplace learning and organizational performance. As there was an increase in organizational outcomes of workplace learning including employee competence, labor productivity, and employee enthusiasm, organizational financial performance also increased.

• RQ 5. There was a statistical difference in terms of the fit in the measurement model and structural equation model in the manufacturing industry and the non-manufacturing industry. When comparing those two industrial groups separately, the manufacturing industry showed a greater magnitude in all paths than the non-manufacturing industry. However, the magnitude was not considerably different.

Discussion

This section presents interpretations of the findings and discusses issues arising from the results of the study. In particular, the research findings of the current study are compared to previous literature. Then, all findings from this study are synthesized across the research questions.

Discussion of the Findings Consistent with the Previous Literature

Several research questions confirmed previous research findings. Several issues are discussed below, based on the results of the current study.
First, a significantly positive relationship between investment in workplace learning and organizational outcomes of workplace learning was consistent with previous research. The findings confirmed the results from prior studies, which investigated the relationship between training and organizational performance (D’Arcimoles, 1997; Faems, Sels, DeWinne, & Maes, 2005; Huselid, 1995; Paul & Anantharaman, 2005; Vlachos, 2008). The results of this study are also consistent with the arguments of Jacobs (2003, 2006), who maintained that training can contribute to employees’ performance by improving competence and by extension to the organizational level.

The findings of the current study also confirmed the relationships among HRD programs of workplace learning, outcomes of HRD programs, and organizational financial performance. Based on the results, an important point is not to emphasize that more investment in HRD programs, more increased outcomes organizations can automatically have. Rather than the issues of degree of investment in employee learning, the results of this study reinforce the notion that HRD programs can result in improved financial performance only when those programs can meet the expectations of organizational needs. Moreover, the finding confirmed argument that employee learning can be meaningful if it could result in an expected level of competence or anticipated job performance, which by extension could lead to positive financial outcomes in organizations (Jacobs, 2006). In this regard, improved employee competence through HRD programs can lead to positive organizational outcomes, which can in turn result in increased financial performance.

Furthermore, the results of the current research confirmed a performance perspective in terms of systems theory. As systems theory suggests, HRD programs and
organizational performance cannot be isolated and rather needs to be inter-connected for the performance as a whole (Jacobs, 2006). The systems theory also suggests that a successful financial result in organizations relies on organizational HRD performance. Likewise, improved organizational HRD outcomes in organizations depend on the enhanced employees’ performance through HRD programs.

Second, the results of the current study can also add new knowledge to the existing knowledge on the relationship between employee learning and organizational performance. The current research found that workplace learning including both formal and informal learning contributed to better learning outcomes. In this respect, the results can provide a clear evidence of influence of employee learning on organizational outcomes of workplace learning, such as employee competence, labor productivity, and employee enthusiasm. Therefore, this study can expand the existing body of knowledge, showing that employee learning can lead to better learning outcomes, which subsequently affect organizational financial performance.

Indeed, employee learning can offer organizations a competitive advantage by providing primary means for organizations to support employee competence (Clarke, 2005; Jacobs, 2003; Lohman, 2005), which in turn can result in an increase of organizational productivity (Muhamad & Idris, 2005). The learning outcomes are important in the cases of both formal and informal learning (Lee & Bruvold, 2003). This indicates that the development of employee skills and knowledge is the key to an organization’s success.

Training as the primary type of formal learning has been substantiated as a force that leads to positive organizational outcomes. In addition to training, the contribution of
informal learning to non-financial outcomes, and by extension financial performance, has been argued by many researchers. Leslie et al. (1997) maintained that informal learning could lead to increased workplace productivity since informal learning through social interactions has potential for improving organizational performance. Enos, Kehrhahn, and Bell (2003) also addressed that proficiency is the primary objective of informal learning in organizations. In recent years, many researchers have provided the strength of informal learning, arguing that it can result in positive learning outcomes (Ellinger, 2005; Enos, Kehrhahn, & Bell, 2003; Koopmans, Doornbos, & Van Eekelen, 2006; Leslie, Aring, & Brand, 1997; Lohman, 2005; Marsick & Watkins, 1997; Rowden, 2007). In this sense, the finding that investment in informal learning activities can lead to better learning outcomes, and by extension to greater financial performance, is in line with previous studies (Enos, Kehrhahn, & Bell, 2003; Leslie, Aring, & Brand, 1997).

Third, the current study expanded the concept of existing workplace learning by including both formal and informal learning. In the field of HRD, the activities or programs to support employees’ performance and organizational performance have focused on either formal- or informal learning. In this respect, the supporting system for employee competence through learning can include various learning approaches. Thus, it is suggested that the term “training” currently used in the literature needs to be replaced with the term “workplace learning.” Workplace learning refers to diverse learning activities which occur on-the-job and off-the-job, with diverse degrees of planning by instructor or facilitator. Therefore, instead of “training,” it would be more reasonable to use the term “workplace learning.”
In addition, as Kuchinke (1998) addressed, it is not necessary to have a dualist perspective on learning versus performance. Likewise, Swanson and Holton (2001) noted that some view learning and performance as rivals, but most see them as partners. Consistent with their arguments, the perspective on workplace learning should be based on the notion that learning and performance should not be separated, but coupled. Therefore, learning and performance can be partners. Performance can be achieved from effective individual learning, and individual learning can in turn lead to performance.

Furthermore, organizations can maximize outcomes of employee learning by effectively blending both formal and informal approaches. Therefore, the mixing approach of learning activities should be considered. To date, training as a formal learning has focused on a planned and systematically designed approach. Moreover, training activities usually occur away from organizations where the employees are working. Arguably, training has narrowed down the various learning activities in the workplace, so that organizations may miss out on other important learning programs. For example, structured on-the-job training (S-OJT), a mixed form of formal and informal learning, is a prominent learning method, which takes place in the workplace with planned methods. If formal learning and informal learning are emphasized separately as a learning approach for employees, it will be difficult to find a place for S-OJT.

Fourth, a significantly positive relationship was found in the relationship between organizational outcomes of workplace learning and organizational performance, confirming the findings of the previous literature (Paul & Anantharaman, 2005). Low $R^2$ suggests that organizational performance may not be sufficiently explained by organizational outcomes of workplace learning. As such, the findings of this study imply
that organizational outcomes of workplace learning may not be a strong predictor for organizational financial performance, even if the relationship between them is significantly positive. Three explanations can be given regarding the low prediction of organizational outcomes of workplace learning for financial performance.

The first explanation is related to indicators of financial performance used in the current research. This study assessed organizational financial performance with actual financial measures of sales per employee, net profit per employee, and gross margin. However, the use of subjective indicators of management perceptions about firm performance such as perceived market share and perceived sales may have different results than the current study. Indeed, Vlachos (2008) argued that perceived indicators of organizational performance by managers’ self-report are more valid, since there are numerous factors influencing financial outcomes. Vlachos (2008) further provided the benefits of using subjective measures, asserting that a certain set of performance indicators to measure organizational performance is not appropriate because every organization has its own characteristics even in the same industry. Based on this discussion, organizational performance may be more suitably explained by organizational outcomes of workplace learning if other indicators, such as managers’ perceived financial performance or other measures for organizational performance, are used to assess organizational performance.

The second explanation regarding the low prediction of organizational outcomes of workplace learning for financial performance is about the appropriate number of years for learning to manifest in a visible financial performance. It is clear that human resource practices can be transformed to profitability, sales, and profits a few years after a human
resource program has been implemented. That is, it can take years for workplace learning activities to hit the highest point of employee productivity and subsequently result in improved financial performance (Vlachos, 2008). However, there is no straightforward clue as to how many years it may take for workplace learning practices as a type of human resource system to translate to visible financial results. From this respect, a two-year time gap, which the current study had, between implementation of workplace learning activities and measurement time for financial outcomes may not be enough to assess the materialization of investment in employee learning.

The third and final reason worth mentioning regarding the low prediction of organizational outcomes of workplace learning for financial performance is the issue of measures such as a single human resource practice (workplace learning) versus a set of human resource practices (selection, staffing, compensation, performance appraisal, and so on) including workplace learning. The finding that workplace learning outcomes did not adequately explain organizational performance is in agreement with the comprehensive perspective of human resource practices. Numerous researchers (D’Arcimoles, 1997; Delery & Doty, 1996; Faems, Sels, DeWinne, & Maes, 2005; Vlachos, 2008; Delaney & Huselid, 1996; Paul & Anantharaman, 2003) have emphasized the need for including various human resource practices (workplace learning, compensation, performance management, and selection) when measuring organizational performance.

Therefore, the results of the current study imply that organizational performance can be predicted better when including other functions such as selection, staffing, compensation, performance evaluation, and promotions in the human resource system,
rather than when having only one workplace learning practice. In other words, organizational performance can be maximized when workplace learning can effectively interact with other human resource practices, since a single practice in the human resource system may be interrelated with other practices (Faems, Sels, DeWinne, & Maes, 2005).

Finally, the research findings confirmed the critical role of organizational outcomes of workplace learning by identifying that their mediating effects were identified between investment in workplace learning and organizational performance. In this vein, this finding clearly supports the mediating process of workplace learning outcomes between workplace learning and organizational performance, which were proposed by previous researchers (Becker, Huselid, Pickus, & Spratt, 1997; Dyer & Reeves, 1995; García, 2005; Guest, 1997; Ostroff & Bowen, 2000; Paul & Anantharaman, 2003; Tharenou, Saks, & Moore, 2007). Moreover, the results of this study are consistent with the research of Paul and Anantharaman (2005) who found that training directly affects the non-financial aspect of organizational performance focusing on employee productivity, which subsequently influences financial performance. Furthermore, this finding suggests that workplace learning outcomes should be ensured to achieve better financial performance from investment in employee learning.

Discussion of the Findings Inconsistent with the Previous Literature

Other research questions did not confirm the findings of previous research. Reasons for those findings are discussed below.
First, unlike the expectation of the moderating role of the organizational perspective on HRD, no moderation exists between investment in workplace learning and organizational outcomes of workplace learning. The results did not support the contingency perspective in the relationship between workplace learning and organizational performance (Delery & Doty, 1996). Thus, this finding did not confirm the contingency approach, which emphasized that organizations with greater value on HRD were expected to have superior learning outcomes and subsequently better organizational performance than those with less value on HRD.

Potential explanations can be provided regarding this result. The organizational perspective on HRD can be viewed as an antecedent of organizational investment in employee learning rather than as a moderator between investment in workplace learning and learning outcomes. In other words, the extent of the organizational value on HRD can determine the degree of financial resources to support employee learning. Indeed, top management is most likely to provide directions for the organizational strategy; organizations valuing employee development tend to devote more attention to employee learning through formal and informal learning in the workplace.

When top management is more committed to employee development with a clear vision of HRD, organizations seem to provide employees with more learning opportunities to improve performance (Aghazadeh, 2007; Hoffman & Mehra, 1999; Maurer & Tarulli, 1994). Maurer and Tarulli (1994) found that company policies which facilitate employee training and development were positively related to employees’ voluntary participation in-house and external employee development activities. Moreover, top management perspective viewing employees as a valuable asset for organizational
success was found as a critical factor of productivity improvement (Hoffman & Mehra, 1999). Additionally, Becker et al. (1997) noted that business and strategic initiatives influence the design of the human resource management system, suggesting that organizational initiatives on HRD are likely to affect organizational planning to make an investment in employee learning.

Second, since there was no previous research comparing two industrial groups (manufacturing industry and non-manufacturing industry) for the linkage of workplace learning and organizational performance, the results of comparing two groups need to be discussed. Even though there was a statistical difference in terms of the fit in the measurement model and structural equation model for the two industrial groups, the statistical significance, direction, and magnitude of the parameter estimates for each path were similar for both groups.

Specifically, the manufacturing industry showed slightly greater magnitude in the relationship between variables depicted in the conceptual model, compared to the non-manufacturing industry. However, the difference in magnitude was minimal between the two groups. Therefore, it is difficult to say that the relationships specified in the conceptual model are different in the two groups.

This research found that the more organizations invest in employee learning, the better their learning outcomes will be, such as employee competence, labor productivity, and employee enthusiasm. This finding implies that employees must actively engage in various learning opportunities, thereby contributing to positive learning outcomes from organizational investment for employee development. In this sense, the results of the current study suggest that the degree of employees’ participation or engagement in
learning activities may be identical. Moreover, the results of the current study may be inconsistent with the previous research (Xiao & Tsang, 2004), which showed that employees in financial industry are more likely to actively participate in workplace learning than those from manufacturing sector.

The different results in the current research and previous research (Xiao & Tsang, 2004) may be due to the use of different indicators for measuring workplace learning. That is, while the study conducted by Xiao and Tsang (2004) included education (offered by a college or university) for the measures of workplace learning, this study did not have those indicators for assessing workplace learning. Therefore, more research is needed to clearly understand the similarities or differences of workplace learning in manufacturing versus in non-manufacturing industries.

*Synthesis of the Findings*

The results of this study mostly support previous research on the positive role of the HRD program on organizational performance. As predicted, the findings of the current research confirmed that investment in both formal and informal learning can finally influence organizational financial performance through outcomes of workplace learning. This finding suggests that if positive learning outcomes cannot be achieved from employee learning, successful organizational performance cannot be guaranteed. Additionally, the mediating role of workplace learning outcomes can explicate the process by which employee learning is related to organizational performance. The investment in workplace learning is indirectly associated with organizational financial
performance through learning outcomes such as employee competence, labor productivity, and employee enthusiasm.

Considering that few studies have investigated how specific variables related to workplace learning influence organizational performance (Jacobs & Washington, 2003; Tharenou, Saks, & Moore, 2007), this study provides a clear understanding of how and by which process workplace learning is linked to organizational financial performance. The research findings also show that it is not just general belief, but true, that employee learning can finally improve organizational financial performance. In this respect, this finding supports that workplace learning helps employees and organizations increase their performance (Aghazadeh, 2007; Muhamad & Idris, 2005).

In contrast to previous research, this study did not identify the moderation effect of organizational perspective on HRD. Organizational value for HRD did not make a difference in the relationship between investment in employee learning and learning outcomes. This leads to the possible interpretation that organizational perspective on HRD may be a triggering factor on organizational interest in devoting financial resources to employee learning. In other words, the more organizations have a clear vision for HRD and regard human resources as a critical asset, the more likely they are to provide various learning opportunities to their employees.

Implications

This study has both theoretical and practical implications for human resource development (HRD). This section first presents implications for HRD research and next discusses implications for HRD practice.
Implications for Future HRD Research

The results of this study generate several directions for the future research.

First, future research may include a wider range of workplace learning when examining the relationship of workplace learning with learning outcomes. The current study included formal and informal types of learning. However, in the real world of organizations, the mixed forms of learning exist by blending formal and informal learning activities (e.g., S-OJT). Therefore, as Jacobs and Park (2009) presented various types of workplace learning with three major variables (degree of planning, location of the learning, and role of others during the learning), a combination of both formal and informal learning and their influence on outcomes can be investigated.

Second, methodological issues can give an avenue for future research. The current research used an existing data, nationally-representative organizational data. The data used for this study were collected from a number of companies, while individual researcher cannot collect data from such a many companies across the nation. However, a high level of missing data in investment in employees’ learning activities constrained to include a wide range of learning programs as measures for workplace learning. This research can show limitations of using the existing dataset, such as the weakness in content validity or instrument design. Thus, future researchers can recognize the strength and weakness of using a existing data across numerous organizations and collecting data from several companies.

Third, this study explicated that investment in workplace learning results in organizational outcomes of workplace learning, which subsequently lead to organizational profitability. However, as several researchers (Dyer & Reeves, 1995;
have suggested, employee attitude (satisfaction, commitment, and involvement) can be included between workplace learning and the non-financial aspect of performance as learning outcomes. Thus, the current research, examining the linkage between employee learning and firm profits, can have more clear evidence by investigating the relationships among employee learning, employees’ affective outcomes (job satisfaction and organizational commitment), employees’ learning outcomes in terms of the non-financial aspect of organizational performance, and organizational financial performance.

Fourth, levels (individual, group or team, or organization) can be considered for future research examining the linkage of employee learning and organizational performance. As Klein, Dansereau, and Hall (1994) argued, organizations are multilevel in nature since employees work in groups and teams within organizations. Thus, it is inevitable to have level issues in organizational studies. Garavan, McGuire, and O’Donnell (2004) also maintained that HRD researchers must pay attention to the distinction between the level of theory and the level of measurement; while the level of theory is related to the targets, the level of measurement focuses on the sources of data.

In future research, where data is collected from individuals to research organizational constructs (such as organizational culture to investigate how organizational culture affects the relationship between workplace learning and organizational performance), level issues should be identified. As another instance, if research seeks to investigate the relationship between employees’ perceptions regarding learning (satisfaction of workplace learning, motivation to learn, or motivation to transfer
learning) and organizational performance, the level of measurement issue must be addressed since data will be collected from different sources (Klein et al., 1994).

Fifth, this study used indicators such as employee competence, labor productivity, and employee enthusiasm to measure workplace learning outcomes at the organizational level. The results showed that these are good indicators, but in future research, other measures can be considered in terms of the non-financial aspect of organizational performance as well as the employee level. Research findings suggest that the impact of workplace learning includes turnover intention, employees’ work performance, transfer of learning, and motivation to transfer learning (Brown, 2005; Enos, Kehrhahn, & Bell, 2003; Kuvaas, 2008; Lankau & Scandura, 2002; Maurer & Lippstreu, 2008; Tsai & Tai, 2003; Velada & Caetano, 2007).

Among learning outcomes, transfer of learning and turnover intention may be good measures for assessing workplace learning outcomes. Transfer of learning and turnover intention are increasingly regarded as important outcomes, which in turn have been found to relate positively to organizational performance. Transfer of learning via motivation to transfer learning exhibited by employees is valued because transfer of learning is presumed to be an ultimate goal of learning. Transfer of learning refers to the application of what employees learn in different learning settings (Baldwin & Ford, 1988). In this regard, transfer of learning has been an issue of vital concern for researchers and practitioners.

Moreover, the issue of turnover is critical for organizational effectiveness since decreases in turnover can lead to increases in organizational performance and a reduction in costs associated with losses of firm-specific knowledge, hiring, and retraining of
replacement employees (Ulrich, Halbrook, Meder, Stuchlik, & Thorpe, 1991). Therefore, future research can consider the use of other measures for assessing workplace learning outcomes in terms of both the employee- and organizational level.

Sixth, future research may consider the organizational perspective on HRD as a triggering factor of organizational decisions for investing its financial resources. This study did not find the moderating effect of the organizational perspective on HRD in the relationship between investment in workplace learning and organizational outcomes of workplace learning. Therefore, an investigation of the organizational perspective on HRD as an antecedent of workplace learning can provide more understanding of the linkage of workplace learning and organizational performance.

Finally, this study used objective financial indicators, such as sales per employee, net profit per employee, and gross margin, to measure organizational financial performance. As described in the above discussion, future research may consider use of other indicators or perceived financial performance by managers’ self-report to measure organizational performance. In addition, an interesting avenue for future research is, as Vlachos (2008) noted, to examine the extent to which individual perceptions about financial performance as self-report measures are consistent with objective organizational measures.

Implications for HRD Practice

First, the main practical contribution of this study is to find the relationship between workplace learning and organizational performance from the empirical point of view. There is general consensus on the importance of workplace learning as a
mechanism to help organizations maintain competitive advantage based on their human resources. However, in reality, the investment in learning activities of companies is relatively low, compared to investment in other areas of an organization. This low investment in employee learning may be due to the uncertainty about the impact of workplace learning on outcomes. Thus, as Ellinger (2004) pointed out, human resource development practitioners should be careful in creating a learning culture to influence both formal and informal learning, thereby improving employee and organizational performance.

Second, HRD practitioners should consider developing more effective learning ways by combining both formal learning and informal learning. For example, they can develop learning mechanisms as blended types by mixing formal program in classrooms with informal processes such as mentoring, coaching, on-the-job training, taskforce team projects, and action learning. To date, most research in workplace learning seems to focus primarily on either training as formal learning or informal learning. Admittedly, there is a strong tendency to see formal and informal learning as essentially different, viewing that two separate paradigms have existed: formal workplace learning and informal workplace learning (Malcolm, Hodkinson, & Colley, 2003). But in effect, most organizations are engaging in implementing both formal and informal learning (Leslie et al., 1997; Rowden, 2002; Rowden, & Ahmad, 2000).

Indeed, researchers (Leslie, Aring, & Brand, 1997; Shipton, Dawson, West, & Patterson, 2002; Svensson, Ellström, & Åberg, 2004; Yoo, 2002) suggested that learning could be maximized by linking formal and informal learning because workplace learning occurs through a dynamic interaction between formal and informal learning. For instance,
Shipton et al. (2002) speculated that both formal learning and informal learning are conducive to learning effectiveness. Additionally, Yoo (2002) found that the combination of formal and informal learning can result in more increased learning effectiveness than having only one approach through qualitative research in one university.

Moreover, one learning method may facilitate another learning approach by interacting synergistically. Therefore, to obtain intended organizational goals, organizations should adequately allocate resources to formal and informal learning activities for employees. The research conducted by Yoo (2002) showed that formal learning enhances informal learning and informal learning opportunities improve formal learning, which contribute to role performance as administrative directors (Yoo, 2002). Similarly, Leslie, Aring and Brand (1997) found that workplace learning occurs through a dynamic interaction between formal and informal learning. They argued that formal learning stimulates informal learning, and informal learning often stimulates the formalization of learning, indicating that the two domains of learning complement each other and result in further improvements and innovations. Therefore, given the actual learning practices at work, it is necessary to consider both learning approaches for maximizing the effectiveness of various workplace learning.

Finally, the results of this study point out the importance of workplace learning outcomes to achieve financial profitability from employee learning. The current research findings suggest that high investment in employee learning alone cannot warrant high levels of profitability. As this study demonstrated, employees’ positive learning outcomes can assure better financial results for organizations. Therefore, HRD practitioners need to reinforce positive learning outcomes to achieve greater financial performance.
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APPENDIX A

THE KOREA 2005 AND 2007 HUMAN CAPITAL CORPORATE PANEL (HCCP) QUESTIONNAIRE ITEMS
<table>
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| **Investment in Workplace Learning (Formal Learning)** | 2.1.1. Please respond the situation of HRD in your company during the year of 2004.  
► For HRD programs, please indicate the programs which were implemented *formally*.  
The extent of investment (*respond only if implementation*)  
(1) group-based on-the-job classroom training  
(2) group-based off-the-job classroom training  
(3) e-learning  
(4) distance training by mail                                                                 |
| **Investment in Workplace Learning (Informal Learning)** | 2.2. Please respond the HRD implementation in your company during the year of 2004.  
► For HRD programs, please indicate the programs which were implemented *formally*.  
The extent of investment (*respond just in case of implementation*)  
(5) mentoring or coaching  
(6) on-the-job training (OJT)  
(7) task force team project  
(8) action learning                                                                                   |
| **Organizational Perspective on HRD**          | 3.4. 3) Top management in my company has a clear vision toward HRD.  
3.4. 4) This company values talented people.  
3.4. 5) Top management in my company often emphasizes the importance of talented people.                                           |
| **Organizational Outcomes of Workplace Learning** | 3.1. How does the HRD programs your company had implemented for the year of 2004 influence following outcomes in terms of  
1) Employee Competence  
2) Labor Productivity  
3) Employee Enthusiasm  

① never improved ② little improved ③ somewhat improved  
④ much improved ⑤ very much improved                                                                            |
| **Organizational Performance**                 | • Sales per employee  
• Net profit per employee  
• Gross Margin  
• Return on equity (ROE)                                                                                     |
APPENDIX B

FIGURES USED FOR DATA EDITING
Note. The case numbers in the square with orange color are outliers indicated in Table 3.7.

Figure 1. A scatterplot matrix of emphasis on talented people and employee competence.
Note. The case numbers in the square with orange color are outliers indicated in Table 3.7.

Figure 2. A scatterplot matrix of emphasis on talented people and labor productivity
Note. The case numbers in the square with orange color are outliers indicated in Table 3.7.

Figure 3. A scatterplot matrix of emphasis on talented people and employee enthusiasm
Note. The case numbers in the square with orange color are outliers indicated in Table 3.7.

Figure 4. A scatterplot matrix of group-based on-the-job classroom training and organizational size
Note. The case numbers in the square with red color are outliers indicated in Table 3.7.

Figure 5. A scatterplot matrix of group-based off-the-job classroom training and organizational size
Note. The case numbers in the square with red color are outliers indicated in Table 3.7.

Figure 6. A scatterplot matrix of on-the-job training (OJT) and organizational size
Note. The case numbers in the square with red color are outliers indicated in Table 3.7.

Figure 7. A scatterplot matrix of task force team project and organizational size
Figure 8. Histogram with normal curve of sales per employee before removing outliers
Figure 9. Boxplot of sales per employee before removing outliers
Figure 10. Histogram with normal curve of net profit per employee before removing outliers
Figure 11. Boxplot of net profit per employee before removing outliers
Figure 12. Histogram with normal curve of gross margin before removing outliers
Figure 13. Boxplot of gross margin before removing outliers
Figure 14. Histogram with normal curve of return on asset before removing outliers
Figure 15. Boxplot of return on asset before removing outliers
Figure 16. Histogram with normal curve of sales per employee after removing outliers
Figure 17. Boxplot of sales per employee after removing outliers
Figure 18. Histogram with normal curve of net profit per employee after removing outliers
Figure 19. Boxplot of net profit per employee after removing outliers
Figure 20. Histogram with normal curve of gross margin after removing outliers
Figure 21. Boxplot of gross margin after removing outliers
Figure 22. Histogram with normal curve of return on asset after removing outliers
Figure 23. Boxplot of return on asset after removing outliers