The Relationships Among Perceived Effectiveness of Network-Building Training Approaches, Extent of Advice Networks, and Perceived Individual Job Performance Among Employees in a Semiconductor Manufacturing Company in Korea

#### Dissertation

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#### ABSTRACT

The purpose of the study was to examine the relationships among perceived effectiveness of NBTAs, extent of advice networks, and perceived job outcomes in a semiconductor manufacturing company in Korea, using a mixed method. A quantitative study was primarily utilized to identify whether the perceived effectiveness of NBTAs is related to the development of advice networks, and whether these advice networks lead to better individual job outcomes. The study, further, tested whether advice networks mediate the relationships between the perceived effectiveness of NBTAs and job outcomes. A qualitative study was used to assist in explaining and interpreting the quantitative results.

The data for the quantitative study were collected from an online survey questionnaire. The population consisted of all employees (N=15,000) who were working in production facilities of the company or branch offices in Korea. The total number of respondents was 188 out of 375 employees randomly selected, with an overall response rate of 50.13%. The data for the qualitative study were gathered from semi-structured interviews with eight employees who responded to the online survey. Canonical correlation analysis and hierarchical regression analysis were utilized to analyze the survey data. Additionally, content analysis was employed to analyzed and interpret the interview data.

The results showed that on-the-job training approaches and training approaches

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within a business unit were perceived to be more helpful than common training approaches to develop advice relations. Yet, no relationships were found between advice networks and the perceived effectiveness of NBTAs. The results also indicated that no mediation occurred between the perceived effectiveness of NBTAs and perceived job outcomes. Although the study failed to reveal the mediation between the perceived effectiveness of NBTAs and perceived job outcomes, the findings from the quantitative and qualitative studies provided evidences that NBTAs helped individuals develop advice networks, and the development of advice networks through NBTAs had an impact on individual job performance and job satisfaction.

In addition, the results of this study identified four processes which create advice networks through training approaches: 1) developing advice networks based on jobrelatedness, 2) sharing a common interest among others, 3) spending time doing group activities with others, and 4) spending time doing extra activities with others. This study provided implications for future research and practice of networks and training approaches in the field of HRD. Dedicated to my parents, Gee-jin Hwang and Young-sook Jung, And to my brothers, Seok-joo and Seok-won Hwang

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#### FIELD OF STUDY

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#### CHAPTER 1

#### INTRODUCTION

Knowledge-based economy has brought about profound changes in the nature and structure of work. In order for organizations to sustain their competitive advantage, they must possess the employee expertise and skills necessary to stay on top. However, as knowledge is becoming rapidly increasing and highly complex, workers, especially knowledge workers, spend much of their time looking for the information needed to perform their jobs and finding right people to talk with (Cross, 2006). Likewise, organizations recognize that their employees must connect and work together with others effectively in order to produce outcome nonimitable.

The emphasis on connection and collaboration also draws the attention of researchers and practitioners from the use of employee knowledge to the use of social networks to achieve better performance. In general, social networks play a crucial role on work and organizational outcomes in two ways (Burt, 2004; Cross & Cummings, 2004). First, networks with individuals from different backgrounds help employees gain early access to diverse, distinctive information and resources (Coleman, 1988; Levin & Cross, 2004). For example, although valuable information is available within an organization, one may not be aware of their existence, or even have access to them. In those cases, knowing people from different fields or grades of expertise is essential to finding people who have the expertise or information one needs; social networks can result in better performance.

Second, dense networks which contain strong ties and relations foster identification within the group and the development of trust and reciprocity (Nahapiet & Ghoshal, 1998; Portes, 1998), and, thereby, facilitating cooperation and exchange within an organization. That is, network density leads group members to identify with one another and assists them in participating in collective action characterized by cooperation among members (Leana & Van Buren, 1999). In addition, the members are more willing to extend favors, such as sharing complex information and tacit knowledge, to one another, because they know that the favors will ultimately be returned (Hansen, 1999; Krackhardt, 1992).

Although researchers and practitioners acknowledge that social networks play an important role in improving individual performance in knowledge-intensive organizations, they rarely attempt to strategically build and support networks. Most assume that more communication is the solution to developing networks within an organization. Yet, more communication is not always better (Oh, Chung, & Labianca, 2004). Since who you know has a significant impact on access to information and future performance (Coleman, 1988; Cohen & Prusak, 2001; Cross & Parker, 2004), a more targeted approach to improve network connectivity is needed to yield the greatest payoff for an organization.

While relatively little is known about the way that networks are developed and supported effectively, scholars such as Collins and Clark (2003) and Cross and Parker (2004) argue that human resource development (HRD) practices can be utilized as a means to strategically improve social networks within organizations. Especially, a

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specific set of training approaches allows individuals to understand coworker's expertise and to develop networks by providing them with opportunities to interact directly with each other (Cohen & Prusak, 2001).

For instance, communities of practice aid workers in creating networks of people who have the same interests and problems (Lesser & Prusak, 1999). Later, workers can obtain task advice from members of the networks in order to solve a problem or to make a decision. Furthermore, collective learning activities such as mentoring, on-the-job training (OJT), and action learning require extensive interaction among other workers as well as the participants during the practices, which, in turn, helps participants to build a wide range of networks (Clarke, Thorpe, Anderson, & Gold, 2006; Cohen & Prusak, 2001; Hezlett & Gibson, 2007; Taylor, Jones, & Boles, 2004).

#### Statement of the Problem

In the knowledge-based economy, knowledge is central to an organization's competitive power. In particular, individual expertise and competence is a key to the success of knowledge-intensive firms. However, as the knowledge and skills required for a job are growing highly diversified and complex, communication and knowledge sharing between individuals have become inevitable. That is, the quality and efficiency of work in today's knowledge economy depend upon whether an organization possesses the channels to connect and communicate with needed knowledge and expertise. Social networks as important conduits for knowledge exchange and interaction among individuals have long performed such a function.

Recent studies show consistent evidence that social networks affect performance

in knowledge-intensive work, especially if those networks involve the ability to acquire work-related information and expertise (Burt, 2004; Cohen & Prusak, 2001; Cross & Parker, 2004; Nahapiet & Ghoshal, 1998). For example, Reagans and Zuckerman (2001) tested whether network variables help account for team productivity using data from 224 corporate research and development (R&D) teams. The results of their study presented that network density is positively related to higher productivity, and teams that include members from different demographic backgrounds achieve a higher level of productivity than teams of a more homogeneous nature. Likewise, Collins and Clark (2003) found that the external and internal social networks of top management teams in high-technology firms are positively associated with firm performance. Using data from organizations in knowledge-intensive industries, Oh et al. (2004) and Cross and Cummings (2004) detected that individual and group performance is related to interaction frequency, network size, and network diversity.

Demonstrated through the studies mentioned above, social networks play a crucial role in improving performance in knowledge-intensive organizations. Furthermore, increased interest has been generated in the strategic development of social networks through supportive employment practices. Leana and Van Buren (1999) argued that human resource (HR) practices such as selection and compensation are the primary means by which organizations can manage the social relationships among their employees. For instance, while practices like downsizing and the regular use of temporary employees undermine meaningful relationships at work, compensation policies based on group performance encourage positive behavior and reinforce relationships within a group. Furthermore, investment in training, job security, and

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collaborative work and learning help develop relational contacts between employee and employer and among coworkers.

Cohen and Prusak (2001) maintained that organizations can develop larger and broader networks by providing their employees with the time and resources necessary for interaction with others. For example, firms can invest in extensive training programs and communication technologies that help their employees build networks and work together on content. Also, Cross and Parker (2004) asserted that the entire HR chain can have an influence on improving connectivity by altering "the kinds of people hired, the way they are developed, and the behaviors that are measured and rewarded (p.124)". In order to build and develop internal relationships, organizations can recruit for collaborative behaviors, conduct training in group settings, and introduce performance appraisals and reward systems that elicit and reinforce collaboration.

In addition, Collins and Clark (2003) conducted a field study among seventy-three high-technology firms and found that network-building HR practices are significantly related to the social networks of top management teams. This conclusion is consistent with the theoretical argument that HR practices can be an effective means for organizations to deliberately manipulate the networks of their employees. Yet, networkbuilding HR practices in the study are defined as overall HR activities, including training, performance assessment, and rewards, designed to encourage top managers to build relationships with internal and external people. This comprehensive inclusion hardly enables researchers to identify the extent to which a specific HR function/activity affects the development of personal networks.

Nevertheless, most researchers agree that training approaches are one of the most

effective ways to build and sustain social networks within organizations (Burt, 2004; Cohen & Prusak, 2001; Cross & Parker, 2004; Cross, 2006; Nebus, 2006). Unlike performance evaluation or reward systems, training approaches allow individuals to understand other's strengths and expertise and to gain easy access to the resources they need by providing opportunities for direct interaction with other people (Cohen & Prusak, 2001; Cross & Parker, 2004). For example, communities of practice (CoPs) help individuals develop a network of people that share similar interests. CoPs also connect individuals from outside the network to those who are already identified as community members (Lesser & Prusak, 1999). By doing so, CoPs enable individuals to extend the personal networks around and within groups to which they belong.

Furthermore, mentoring relationships and OJT sessions operate to strengthen social relationships among individuals. Both are learning as the process of identity formation that a mentee/trainee is socialized as a member of a community of practitioners (de Jong, Thijssen, & Versloot, 2001; Hezlett & Gibson, 2007; Leana & Van Buren, 1999). For OJT trainees, learning with peers and other experienced workers in an informal setting allows them to be aware of communal knowledge and to improve social relationships. In addition to mentoring and OJT sessions, action learning helps develop social networks by enabling individuals to interact and exchange ideas during conversations or group problem-solving sessions (Clarke et al., 2006).

As discussed, more and better social networks produce better communication and collaboration in a firm. If the assertion that training approaches help individuals improve social networks and connectivity within an organization is true, it is logically predicted that networks produced through training interventions contribute to the improvement of

individual performance. Although it seems proven that certain training activities play a crucial role in developing and supporting personal networks within firms, very little evidence exists to support the impact of these training approaches on building social networks within the organizational setting.

Thus, the purpose of this study is to examine the relationships among perceived effectiveness of network-building training approaches (NBTAs), extent of advice networks, and perceived job outcomes using a mixed method.

#### **Research Questions**

The research questions addressed in this study are as follows:

- 1. What is the perceived effectiveness of NBTAs in developing advice networks?
- 2. What is the relationship between the perceived effectiveness of NBTAs and respondent's advice networks?
- 3. What is the relationship between respondents' demographic characteristics and the nature of advice networks?
- 4. What is the relationship between respondents' advice networks and perceptions of job outcomes?
- 5. Does the nature of respondents' advice networks mediate between the perceived effectiveness of NBTAs and perceptions of job outcomes?
- 6. What are the processes through which respondents develop advice networks?
- 7. To what extent does involvement in training programs using NBTAs encourage the development of advice networks?

#### Definition of Terms

The terms of this study are operationally defined as follows:

#### Perceived Effectiveness of Network-Building Training Approaches (NBTAs)

NBTAs refer to processes that develop employee competence by providing opportunities to interact with coworkers in either a formal or informal setting. In this study, perceived effectiveness of NBTAs is operationally defined as the summated average of responses to items on perceptions of NBTAs. The responses are based on a five point summated rating scale ranging from very ineffective = 1 to very effective = 5.

#### Advice Networks

Advice networks refer to the relationships developed through NBTAs which allow individuals to share the resources needed to complete their work and solve their problems (Sparrowe, Liden, Wayne, & Kraimer, 2001). This construct includes the size, diversity, and interaction frequency of the advice networks developed through network-building training. These variables were measured using a name generator method (Campbell & Lee, 1991) which asks respondents to list five initials of individuals within their advice networks.

*Network size* indicates the total number of contacts in a network. In this study, the network size is operationally defined as the total number of network contacts that a respondent listed.

*Horizontal* refers to the total number of contacts from different business units in a network. In this study, the horizontal is operationally defined as the total number of

contacts working outside a respondent's business unit.

*Vertical* refers to the total number of contacts in superior positions in a network. The vertical is operationally defined as the total number of contacts at a higher job level than a respondent.

*Frequency of interaction* refers to the potency of the bond between members of a network (Granovetter, 1973). The interaction frequency this study is operationally defined as the self-reported average number of times per month that a respondent interacted with identified contacts.

#### Perceived Job Outcomes

Job outcomes refer to the quality expected from individual employees, which directly and indirectly affect an organization's profitability. This study measured the perception of individual job outcomes. The construct consists of three variables: perceived job performance, perceived job satisfaction, and turnover intention.

*Perceived job performance* in this study refers to the summated average of responses to items on perceived job quality; this includes efficiency, effectiveness, and promotion expectation. The responses are based on a five point summated rating scale ranging from strongly disagree = 1 to strongly agree = 5.

*Perceived job satisfaction* is operationally defined as the summated average of responses to items on job satisfaction. The responses are based on a five point summated rating scale ranging from strongly disagree = 1 to strongly agree = 5.

*Turnover intention* in this study refers to the summated average of responses to items on intention to turnover. The responses are based on a five point summated rating scale ranging from strongly disagree = 1 to strongly agree = 5.

#### Demographic Characteristics Variables

- *Gender*. This variable refers to the respondent's self-reported sex, male or female.
- *Education Level*. This variable refers to the respondent's highest educational level, including high school diploma, associate degree, bachelor's degree, or graduate degree.
- *Job Level*. This variable refers to the respondent's position in which he/she currently serves, including staff, assistant manager, manger, or senior manager or higher.
- *Years of Service at the Organization*. This variable refers to the respondent's total number of years of service at the organization.
- *Emotional instability.* This variable is operationally defined as the summated average of responses to items on emotional instability; the items were adapted from the International Personality Item Pool (IPIP) inventory (Goldberg, 1999). The responses are based on a five point summated rating scale ranging from strongly disagree = 1 to strongly agree = 5.

#### Limitations

The limitations of this study are as follows:

- The generalizability of the results is limited to the population of an organization studied in Korea.
- Individual performance measures are self-rated and advice network variables are based on respondent perceptions.
- The respondents may not have had sufficient knowledge to respond accurately.
- This study gathers information at a single point in time.
- Since the survey measures of network-building training approaches and advice networks are collected concurrently, causality between constructs is not able to be established.

#### Significance of the Study

The results of this study contribute to HRD theory and practice in several ways. First, this study explores the black box between training and learning approaches and firm performance by providing evidence that a set of network-building training approaches is related to individual performance through advice networks. There is no doubt that employee development offers learning opportunities to improve employee knowledge, in turn, heightened employee skills result in better performance outcomes (Jacobs & Washington, 2003). Despite this axiom, only ten percent of what employees learn during training is actually applied to their work (Cross, 2006). This means that, so far, ninety percent of the black box between employee development and firm performance has not been revealed. However, this study provides more explanation on the box by showing that training approaches produce social networks in addition to learning outcomes, and, thereby, improve individual performance.

Second, this study provides empirical evidence that certain training approaches help develop personal networks by testing the relationship between network-building training approaches and advice networks. Scholars argue that learning and training activities may aid in the development of social networks within an organization (Cohen & Prusak, 2001; Hezlett & Gibson, 2007; Leana & Van Buren, 1999). However, due to the lack of empirical research on social networks, this argument has not been verified by any research. Although a few qualitative studies on social networks and learning activities have been found (Clarke et al., 2006), no quantitative studies have been conducted so far. Thus, this study reinforces the weak relationship between theoretical and empirical work on social networks in the field of HRD by employing a primarily quantitative method.

Third, this study contributes to the understanding of important principles that help design and implement effective training programs to develop and support personal networks. Since few guidelines for network-building exist within an organization (Cross & Parker, 2004), HRD practitioners overlook designing the network-building components in training programs. This study uses qualitative data analysis to produce the key factors and distinctive characteristics of NBTA. The results of the qualitative study will provide principles that can be utilized when HRD professionals improve employee development programs. Furthermore, as Hatala and Fleming (2007) pointed out, HRD researchers may build theory regarding participation in and the design of learning activities based on the results of this study.

Finally, HRD professionals and organizational leaders can apply the findings of this study to improve employee development programs by emphasizing the benefits of networking. Although the importance of social networks within organizations is acknowledged, many executives and HRD managers barely attempt to support and develop connectivity (Cross & Parker, 2004). This issue arises due to insufficient knowledge of strategic ways to foster networks or an assumption that personal networks are just a product of interaction and communication. The findings of this study will provide leaders and HRD practitioners with insight on employee development through building social networks. In turn, they will be able to design and develop training programs, including network-building, to yield the greatest payoff for their organizations.

#### CHAPTER 2

#### **REVIEW OF LITERATURE**

This chapter consists of four main sections. The first section of the chapter reviews the definition and components of HRD. The second section discusses training approaches in the workplace. The third section introduces social network theory and explores an advice network and its development. This chapter concludes with a proposed conceptual framework based on the literature review.

#### Human Resource Development

This section contains two parts. The first part reviews the definition of HRD, and the second part describes what constitutes HRD.

#### Definition of HRD

HRD is a field of study and an area of professional practice (Jacobs, 1990). For the last decades, considerable effort has been devoted to defining the field of HRD to develop its identity as a profession. Many different definitions have emerged, which made it difficult for HRD to obtain a universally accepted definition. However, despite the lack of consensus on a precise definition of HRD, it is observed that the definitions have evolved including common themes of HRD. First, the early definitions presented in the literature have begun with a relatively narrow conception of organizational classroom-based training (Chalofsky, 1992). Yet, this focus has evolved to a broader conception of an integral process of human and organizational development. For instance, Nadler in 1970 first defined HRD as "a series of organized activities conducted within a specified time and designed to produce behavioral change" (p. 3). McLagan (1983) primarily focused on training and development and viewed HRD as training and development which "is identifying, assessing and –through planned learning- helping develop the key competencies which enable individuals to perform current or future jobs" (p. 25). Further, Chalofsky and Lincoln (1983) defined the discipline of HRD as "the study of how individuals and groups in organizations change through learning" (p. 20).

However, since the late 1980s, the emphasis has been placed on the concept of the process or systems of development. Swanson in 1987 defined HRD as "a process of improving an organization's performance through the capabilities of it's personnel. HRD includes activities dealing with work design, aptitude, expertise and motivation". Jacobs (1988) continued to emphasize human performance systems, and defined HRD as human performance technology which is "the development of human performance systems, and the management of the resulting systems, using a systems approach to achieve organizational and individual goals" (p. 5). McLagan modified the early definition in 1989, including the concept of HRD systems: "HRD is the integrated use of training and development, career development and organizational development to improve individual and organizational effectiveness" (p. 7).

Second, while the early definitions have focused on behavioral change of

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organizational members, the important change with more recent definition is the mention of performance improvement. Chalofsky and Lincoln's (1983) key focus was to achieve behavioral change of individuals through planned training and development. Yet, performance improvement has begun to be seen as an underlying component of HRD definition and as a primary result of HRD since the late 1980s. As a result, HRD has been redefined as reflecting a performance orientation to the profession. For example, Nadler (1989) revised his early definition of HRD as "organized learning experiences provided by employees within a specified period of time to bring about the possibility of performance improvement and/or personal growth" (p.6). Swanson (1995) redefined HRD as "a process of developing and/or unleashing human expertise through organization development and personal training and development for the purpose of improving performance" (p.208).

Like this, although these definitions lack consensus on a precise definition of HRD, it is seen that there are two continuing themes: systems approach and performance improvement. That is, HRD as an integral process of development aims to improving performance of an organization. Therefore, including these common themes, this study refers to 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" (Jacobs, 2006, p. 21).

#### Components of HRD

Although there is no definitive view of what constitutes HRD, there is wide agreement that HRD consists of three fundamental components such as employee development, organization development, and career development (Gilley & Eggland, 1989; McLagan, 1989; Swanson & Holton, 2001; Jacobs, 2006). Each component contributes to organization in different ways, yet all three have one focus, performance improvement (Gilley & Eggland, 1989).

Employee development, or individual development, focuses on personal development and performance improvement through training and education programs. Especially, many practitioners and researchers refer to employee development as structured training. According to McLagan (1989), individual development is a process of "identifying, assessing, and helping develop, through planned learning, the key competencies that enable individuals to perform current or future jobs" (p.52). And Jacobs and Washington (2003) defined employee development as "an integrated set of planned programs, provided over a period of time, to help assure that all individuals have the competence necessary to perform to their fullest potential in support of the organization's goals" (p. 344). As shown in the definitions, as a process, employee development has been considered to be delivered through planned programs including off-the-job and on-the-job training programs, seminars, self-study materials, mentoring programs, and so on.

However, it is noteworthy that learning occurs in both formal and informal settings and majority of people actually learn related to their work performance through unstructured, on-the-job learning activities (Leslie, Aring, & Brand, 1998), while training usually occurs off the job. The difference between learning in informal settings and training is whether or not learning is planned by an organization, but both have the same purpose that unleashes employee expertise and improves performance. In this sense, employee development can be identified as the process of developing employee competence and knowledge and thereby improving organizations through all types of training programs and learning activities (Gilley & Eggland, 1989). Regarding this, what methods of training, including formal and informal approaches, exist in the workplace and what each characteristic is are discussed in detail in the next section.

Organization development is directed at improvements at the organization, process, work group, and individual levels through organizational change in terms of efficiency, effectiveness, and health, while employee development is mainly oriented to individual development and improvement (Swanson & Holton, 2001). As much effort within organization development practice is focused on long-range performance improvements or holistic changes in the culture, the interventions deal with the change process, rather than a fix-it strategy (Gilley & Eggland, 1989). Therefore, organization development can be defined as "a system-wide application of behavioral science knowledge to the planned development and reinforcement of organizational strategies, structures, and processes for improving an organization's effectiveness" (Cummings & Worley, 2001, p. 2).

Successful change is guided by a change agent, usually an HRD practitioner, who plays a role in facilitating the dynamic process of organization development. And the process is based on an action-research orientation in which the scientific method is applied to practical organizational problems (Gilley & Eggland, 1989). Cummings and Worley (2001) portrayed the action research process in eight steps: 1) problem identification, 2) consultation with a behavioral science expert, 3) data gathering and preliminary diagnosis, 4) feedback to a key client or group, 5) joint diagnosis of the problem, 6) joint action planning, 7) action, and 8) data gathering after action.

Career development focuses on allowing employees to examine future career paths and, further, analyze their abilities and interests in order to better match their personal needs for growth and development with the needs of the organization. In this sense, Gilley and Eggland (1989) defined career development as "an organized, planned effort comprised of structured activities or processes that result in a mutual career plotting effort between employees and the organization" (p. 48). Within this effort, individual activities include career planning and utilizing career resource centers, while organizational activities include such career management as mentoring systems, career resource center development and maintenance, performance appraisal, and job posting systems.

However, as a recent study (Johansen, Kusy, & Rouda, 1996) indicates, career development is now the primary responsibility of individuals in organizations and tends to be considered as the least important function of HRD. Nonetheless, organizations implement career development programs for the purpose of improving their performance by promoting the employees from within and reducing turnover (Gilley & Eggland, 1989). Additionally, effective career development programs enhance employee attitudes toward work and increase worker satisfaction and motivation, which in turn improve employee productivity and efficiency.

#### Training Approaches in the Workplace

This section consists of three parts. The first part identifies types of training approaches and describes characteristics of each type. Next, the study reviews the

literature on the impact of training approaches on network-building. Lastly, the third part discusses learning theories that underlie network-building training approaches.

#### Types of Training Approaches

There are a number of dimensions on which training can be characterized. Among those, two important dimensions are the extent to which others are involved during the learning process (Danziger & Dunkle, 2005; Jacobs & Park, 2009; Mondy & Noe, 1996) and the location of the training (Danziger & Dunkle, 2005; Jacobs & Park, 2009; Noe, 2007; Swanson & Holton, 2001). As shown in Figure 2.1, this study uses these dimensions to identify types of training approaches. The notion of these two dimensions was borrowed from those of Jacobs and Park's (2009) conceptual framework of workplace learning which represents a synthesis of the workplace learning literature and the realities of HRD practices in organizations.

The vertical axis distinguishes training approaches that require little interaction with a trainer and facilitator from those that require the direct, frequent involvement of a trainer or facilitator, which the study terms the role of trainer/facilitator of the learning to engage the trainee. Passive role indicates training in which the trainer or facilitator only plays a limited role, such as providing feedback on assignment or questions, in the learning process. On the other hand, the training characterized by the active trainer or facilitator means approaches in which the role of trainer/facilitator is distinctive as an instructor, mentor, or coach and a high degree of interaction between trainer/facilitator and trainees exists throughout the learning process.

The horizontal axis distinguishes training that occurs on the job from training that

takes place off the job, which is termed as the location of the learning. Off the job training takes place away from normal work situation, while on the job training occurs near or in the actual workplace (Jacobs, 2003). Training that occurs at the worksite tends to be described as informal learning (Cofer, 2000; Cross, 2006; Danziger & Dunkle, 2005). Yet, in that such planned training programs as structured On-the-Job Training (OJT), formal mentoring relationship, or action learning are provided to workers on the job, on the job learning can be either formal or informal.

				-
		Off the Job		On the Job
rning		Self-directed learning, Simulation, Text-based online training		Casual coaching/mentoring, Action learning, CoPs
itator of Lea Trainee	Passive	Passive/Off the Job		Passive/On the Job
acil the '		Ι	II	
er/F ige		III	IV	
of the Traine to Enge	Active	Active/Off the Job		Active/On the Job
Role		Group-based classroom, Corporate university		OJT, Apprenticeship, Formal mentoring/coaching

Location of the Learning

Figure 2.1: A Typology of Training Approaches in Organizations

Figure 2.1 presents four types of training approaches and each quadrant contains examples of the training approaches. For example, passive/off the job in the first quadrant generally represents self-study that takes place away from the work setting. In most cases

of this type of training, an individual take responsibility for all aspects of learning. The learning process is mostly conducted and controlled by a trainee without an instructor or with limited involvement of a trainer or facilitator (Noe, 2007). The examples of this training are self-directed learning, simulation, or text-based online learning.

Quadrant II, passive/on the job, refers to training approaches that occur at the actual work setting with limited involvement of a trainer or facilitator. This form of learning and training includes casual coaching, ad hoc mentoring, learning while doing, communities of practice (CoPs), action learning, and reflection-in-action. Learning in this case usually occurs while individuals talk with others about how to get work done or to solve a particular problem, collaborate with others to complete a project, share practices and information within a community, and so on (Lohman & Woolf, 2001).

Active/off the job in Quadrant III represents that training takes place a site away from the actual work environment through direct interaction with a trainer or facilitator. Such approaches as group-based classroom training, distance learning using synchronous and asynchronous technology, and corporate university are examples of this form of training. In general, training programs in this case are designed and developed by HRD professionals and a designated instructor or facilitator plays an important role in delivering the courses to trainees away from their place of work (Mondy & Noe, 1996).

The last quadrant is termed as active/on the job. This reflects training approaches that occurs near or at the actual work setting with direct involvement of a trainer or facilitator. The instances of those approaches are unstructured and structured OJT, planned mentoring relationship, and formal coaching. Most of these learning activities might be called unstructured on-the-job training, or "follow Joe" training (Jacobs & Park,
2009). Individuals in these approaches learn through the opportunities for exploration and discovery.

#### Training and Network Building

While there is wide consensus among researchers that personal networks have a significant impact on learning, innovation, and firm performance, understanding on how this organizational resource may be supported and developed is barely known. Research on strategic human resource management suggests that organizations can support and build social networks through human resource (HR) practices. Leana and Van Buren (1999) argued that HR practices are the primary means by which firms can manage the set of social relationships held by organizational employees. Collins and Clark (2003) further demonstrated that top management team members are more likely to build large and diverse internal and external networks if their HR practices are explicitly tied to the development of social relationships with other actors.

Especially, some scholars including Cohen and Prusak (2001) and Cross and Parker (2004) argue that training approaches and strategies may serve as a crucial means to promote personal networks within firms. According to Cross and Parker (2004), the direct interaction and contact between members are effective to develop social relations and networks. In this sense, they stressed the importance of employment practices which help people within the firm integrate more smoothly by providing them with opportunities to access physically. In particular, such training interventions as mentoring relationships, new employee orientation programs, and communication forums were suggested as representative approaches to improve networks. That is to say, training approaches like a seminar or mentoring offer opportunities of periodic face-to-face meeting, which allows individuals to understand others' strengths and expertise and to have easy access to social resources they need within organizations.

Communities of practice can be also regarded as an important inspiration for cultivating networks. Communities of practice help individuals develop a network of people who have similar interests and connect individuals from outside the network to those who are already identified as community members (Lesser & Prusak, 1999). By doing so, it allows employees to extend their networks around and within groups to which they belong. According to Cohen and Prusak (2001), for this function in particular, the communities are more critical for new comers who are looking to identify one who hold the firm-specific knowledge needed to grasp their new roles and skills.

Further, the literature showed that the social relations can be built and cultivated by On-the-Job Training (OJT) and mentoring program (Cohen & Prusak, 2001). New workers tend to face two challenges in a new work setting: learning and understanding their future jobs and adapting to new environments. OJT and mentoring programs help new hires not only build social networks and trust, but also learn how works really get done around the workplace. Experienced workers and trainers provide new comers, who do not yet connect with colleagues, with opportunities to form personal networks by introducing those who have knowledge they need to know. Furthermore, by communicating with various different people in the workplace, new employees who lack knowledge of the organization norms and values can understand and assimilate into the company culture. Through this process becoming a member of the community, new hires can build trust and feel identification and further acquire work-related knowledge and

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skills (Lave and Wenger, 1991).

Cross and Parker (2004) found that energizing interaction and relationships reinforce performance of the firm and the interaction exists in conversations or group problem-solving sessions. In this sense, action learning provides a means developing energizing relationships in that its focus is on real world issues and solves the problems to improve performance of an organization in real work settings (Clarke et al., 2006). Especially, when the results of action learning are directly reflected by the firm, individuals can ensure that their engagement and ideas contribute to the success of the organization. This forms energizing relationships both between employee and employer and among coworkers within an organization, which eventually fosters organizational social capital.

Like this, it appears that a particular set of training approaches play a vital role in forming networks within an organization in some ways. Especially, in most case, such training approaches are characterized by learning through relationships with peers or a supervisor at work, which are included in Quadrant II and IV of the Figure 2.1. That is, these approaches develop employee competence by providing participants with opportunities to interact with and learn with and from each other throughout learning processes in either a formal or informal way, which are defined as network-building training approaches in this study.

## Underlying Learning Theory of Network-Building Training

Learning theory is a discipline of psychology that attempts to explain how an individual learns (Driscoll, 1999), which helps gain a better understanding of training

approaches and strategies. Although there are several learning theories that relate to the process of learning, the underlying theory of network-building training approaches are mainly considered as social learning theory and social development theory. Both theories focus on the learning that occurs within a social context.

*Social Learning Theory.* Social learning theory proposed by Bandura (1977) is to describe and predict how people learn from observation of models, which is also known as observational learning. Observational learning is shown to be more efficient than trial and error learning under many conditions. For this reason, people learn by observing and modeling other persons whom they believe are credible and knowledge in a workplace. According to social learning theory, the processes underlying observational learning include attention, reproduction, and motivation.

First, attention refers to various factors increase or decrease the amount of attention paid. Individuals must perceive and attend to the significant features of the model's performance in order to learn much through observation. Learners also need be aware of the skills or behavior they are supposed to observe (Noe, 2007). A learner who has successfully learned other skills or behavior by observing the model is more likely to attend to the model.

Second, retention is to remember what learners paid attention to. Learners cannot learn properly by observation, unless they are able to remember the behaviors and skills that they observe. Learners have to code the observed behavior and skills in memory in an organized manner, so they can reproduce the modeled cues for the appropriate situation. Retention of the modeled behaviors or skills can be coded as visual images or verbal statements. Third, reproduction indicates the ability to replicate the behaviors and skills that the model demonstrated. The learner's success in reproducing the modeled performance depends on the extent to which he/she can recall the skill or behavior and the extent to which he/she has the physical capability to perform the behavior or exhibit the skill. Learners must have the opportunity to practice and receive feedback to modify their behavior to be similar to the model's behavior, because performance of behavior is usually not perfect on the first attempt.

The final condition for observational learning to occur is motivation or reinforcements. Learners are more likely to adopt a modeled behavior when they have a good reason to imitate. Therefore, social learning theory emphasizes that behaviors that are reinforced will be repeated in the future. There are three different ways to administer rewards which affect performance of the modeled behavior. The learner may be rewarded; directly for certain behavior; by seeing a model rewarded; and for carrying out a particular way by him/herself.

This observational learning process is the primary basis for mentoring and coaching and has influenced the development of structured OJT (Jacobs, 2003). For example, a mentor acts as a model for the acquisition of complex social and personal skills and an OJT trainer demonstrates safe and confident behavior in a situation which mistakes could be costly and dangerous. Further, a lot of informal learning activities that take place at the worksite are based on learning through modeling. Such modeling or imitation results from the whole integrated behavior and action of a model rather than his/her words. That is, without the relationship and interaction between observer and model in a social context, learning cannot occur effectively.

Social Development Theory. Social development theory proposed by Vygotsky was introduced to the West in 1960s (Driscoll, 1999). The major theme of the theory is that social interaction precedes development and that consciousness and cognition are the end product of socialization and social behavior. That is, social interaction plays a fundamental role in the process of cognitive development and learning takes place by means of social experiences. This notion of social development theory later becomes the foundation for what has become known as situated learning invented by Lave and Wenger (1991). Vygotsky (1978) focused on the connections between people and the socio-cultural context in which they act and interact in shared experiences (Crawford, 1996). Social development theory basically rests on two major principles (Driscoll, 1999): the More Knowledgeable Other (MKO) and Zone of Proximal Development (ZPD).

The MKO refers to someone who has a better understanding or a higher ability level than the learner, with respect to a particular task, process, or concept. The MKO is normally thought of as being an instructor, trainer, or experienced worker, but the MKO could also be peers, a younger person, or even computers. The key to MKO is that they must have more knowledge and experience about the topic being learned than the learner does. Thus, a social context wherein a more competent learner would be paired with a less competent one is recommended, because the former can elevate the latter's competence. Accordingly, learners need to work together to construct their learning, teach each other so to speak, in a socio-cultural environment. Training opportunities for collaboration on difficult problem-solving tasks will offer support to learners who are struggling with the material. The ZPD is a central concept of social development theory on how learning takes place. The ZPD refers to the distance between a learner's ability to perform a task under adult guidance or in collaboration with more capable peers and the learner's ability solving the problem independently. Learning occurs in this zone. That is, learning takes place just above the learner's current level of competence and the copying learner will have a higher performance when working with a MKO. The ZPD works in conjunction with the use of scaffolding. Scaffolding is a process through which a trainer or more competent peer provides aid to the learner in his/her ZDP as necessary, and gradually tapers off this aid as it becomes unnecessary. Scaffolding is characterized by three features; 1) the essentially dialogic nature of the discourse in which knowledge is coconstructed; 2) the significance of the kind of activity in which knowing is embedded; and 3) the role of artifacts that mediate knowing.

While the focus of observational learning is more toward the cognitive processes involved in the observation, Vygotsky's theory promotes learning contexts in which learners play an active role in learning. Role of an instructor is therefore shifted into a facilitator, as an instructor should collaborate with his or her learners in order to help facilitate meaning construction in learners. The facilitator's role is even sometimes ambiguous when learners interact with and learn from their peers. Learning becomes a reciprocal experience for the learners and facilitator.

#### Social Network Theory

This section consists of four parts that discusses social network theory and an advice network which is one of the social network types. Specifically, the first part introduces social network theory and describes types and characteristics of social networks. The second part reviews social network measures typically used in network research in organizations. The third part describes advice networks, and the last part explains how to develop advice networks within organizations in detail.

## Overview of Social Network Theory

Social network theory is a branch of social science that discusses the connection and relationship in a social structure. A network refers to a set of the relationship between objects or nodes (Kadushin, 2004). In social networks, the objects are actors that are represented by individuals or groups of people. A social network thus is defined as a set of actors that are connected by a set of relationships, ties, or a specified type of ties (Kilduff & Tsai, 2003). These actors could be individual persons, groups or organizational units, organizations, or industries, or even nation states. Yet, this study focuses on a personal network in which actors are individual persons and is conducted at the interpersonal level of analysis. The term personal networks is used interchangeably with social networks in this study.

*Social Network Types.* As mentioned, social network is made of nodes that are the individual actors within the networks and ties that show the relationships between the actors. The ties are conduits through which various contents, such as an advice, information, friendship, career or emotional support, idea, cooperation, and so on, are

exchanged or flow. Thus, the type of social networks can be categorized in terms of the content conveyed through ties (Podolny & Baron, 1997). For example, advice network is considered the type of network tie through which information, task advice, and aid necessary to do work, while friendship network generally shares friendship and affection with the actors of the network through its ties. This categorization is based on the assumption that social networks convey only one type of resource.

However, in practice, the structure of social relationships is much more complex, and social networks can access to multiple types of resources (Oh et al., 2004). This is because, as relationships develop, personal networks also evolve in the way that they tend to broaden from being very specific to including more foci and resources (Nebus, 2006). Nonetheless, the general research emphasis in organizations has often been on investigating single-resource ties, because it allows researchers to examine how the value or attributes of specific network ties change over time (Podolny & Baron, 1997). Therefore, this study also focuses on single-resource ties, work-related advice networks, and looks at how the attributes of the advice networks are influenced by certain training approaches. Advice networks are discussed in detail in the next part.

*Social Network Attributes.* Social network research in management is an attempt to understand organizations through patterns and linkages among people. Although many different attributes of social capital have been offered by scholars (Burt, 2004; Coleman, 1988; Lin, 2001; Nahapiet & Ghoshal, 1998; Putnam, 2000), in a broad sense, there are two social network attributes which are used to study and analyze the dynamics of relationships and phenomena in organizations: strong ties and weak ties. The literature on social networks and social capital distinguishes one from the other in terms of density and

strength of ties.

Density refers to the extensiveness of ties between actors, and is measured by comparing the number of existing connections in a network to the maximum number of connections that are possible (Kilduff & Tsai, 2003). The higher the proportion of ties, the denser the network is. Figure 2.2 shows examples of a sparse and dense network. In Network A, B, and C, there are the same number of actors and the total number of possible connections is the same. However, compared to network A and C, network B shows a dense network in which every actor is connected to every other actor. Network C has the least dense network among the three networks.



Figure 2.2: Strength of Ties Diagram

Strong ties (Granovetter, 1982), or social closure (Burt, 2004), indicate network density that is connections between actors inside a group or network. In Figure 2.2, for

example, relationships between parties in group A, B, and C represent strong ties. Strong ties tend to be relationships between people who work, live, or play together. People with strong ties also tend to share norms or their ideas and further think alike. Thus, strong ties are characterized by frequent interaction, extended history, intimacy and sharing, reciprocity in exchanges that allow for mutual confiding, and trust-based interactions (Granovetter, 1982).

These characteristics foster identification with the group and a level of mutual trust, which in turn facilitate the flow of richer and detailed information and knowledge resources between individuals within the group (Coleman, 1988). Therefore, strong ties tend to promote the transfer of tacit and complex knowledge in organizations (Nahapiet & Ghoshal, 1998; Reagans & Zuckerman, 2001). However, since group members tend to know the same people, strong ties tend to provide redundant information (Granovetter, 1982; Portes, 1998).

On the other hand, weak ties (Granovetter, 1982) refer to relationships between actors across different groups or networks. Burt (2004) coined the term 'structural holes' to describe the same phenomena as weak ties: that is, structural holes indicate the social gap between different groups. In figure 2.2, weak-tie relationships are shown as a dotted line. Unlike strong ties, network of weak ties are characterized by less frequent social interaction and less dense networks that consist of individuals who have few contacts in common (Kilduff & Tsai, 2003).

These characteristics help individuals bridge structural holes and broker information exchange between otherwise disconnected or weakly connected groups, which further allow them to gain access to a broader array of resources and nonredundant information (Burt, 2004; Granovetter, 1982). That is, weak ties are crucial for an efficient information screening and distribution for members of those networks (Nahapiet & Ghoshal, 1998). In this way, links between people with different skills, information, and experience in organizations have a substantial impact on their capacity for creative action and innovation (Cross & Parker, 2004; Hansen, 1999; Reagans & Zuckerman, 2001)

#### Social Network Measures

Network ties between actors possess many properties including frequency, strength, stability, and closeness (Monge & Contractor, 2003). There is a considerable literature that describes various network measures to analyze these properties. These properties can be computed at such various levels of analysis as interpersonal, intergroup, and interorganizational levels of analysis (Brass, Galaskiewicz, Greve, & Tsai, 2004). The interpersonal level focuses on individual people as actors, whereas the intergroup and interorganizational levels focus on groups and organizations respectively. This study focuses on social network measures at the interpersonal level of analysis, since a major concern here is with advice network that individuals possess and access.

Table 2.1 summarizes major network measures used to describe network properties in studies of social network in organizations. Those studies largely examine the relationships networks, such as advice network, friendship network, informal network, and performance or knowledge transfer at the interpersonal level of analysis. Table 2.1 shows that there are five measures frequently used to analyze network patterns of relationships: size, density, range, strength, and centrality.

Definition	Measure	Study
Number of actors in the network	Size	Collins & Clark (2003); Podolny & Baron (1997); Rhee (2004)
Ratio of the number of actual connections to the number of possible connections in the network	Density (Closure)	Athanassiou & Nigh (1999); Oh et al. (2004); Podolny & Baron (1997); Reagans & Zuckerman (2001); Rhee (2004); Sparrowe et al. (2001)
Number of connections to different others (Diversity of connections in a network)	Range (Diversity)	Collins & Clark (2003); Oh et al. (2004); Reagans & Zuckerman (2001)
Intensity of the relationship between actors (Measures including interaction frequency, amount of time, emotional intensity, or closeness of a bond)	Strength	Collins & Clark (2003); Levin & Cross (2004); Podolny & Baron (1997); Gibbons (2004);
Extent to which an actor is central to a network (Measures including degree, closeness, and betweenness)	Centrality	Sparrowe et al. (2001)

Table 2.1: Major Social Network Measures Used to Describe Networks

Network size, density, and range are basic network measures that have been frequently employed to describe the structure and pattern of social relations. Network size refers to the number of people in a particular network, which is measured as the total number of direct ties in the network. Network density, as discussed, refers to the degree that network members are interconnected, and is measured as ratio of the number of actual connections to the number of possible connections in the network. Network range refers to the diversity of connections in a particular social network, which is measured as the number of different actor categories, such as a department, position, or tenure, that a network accesses.

Centrality and tie strength are the two network measures that have been used most often to predict individuals' attitudes and behaviors (Mayo, Meindl, & Pastor, 2003). Strength of ties refers to the intensity of the relationship between actors in the network (Granovetter, 1982). Interaction frequency, amount of time, the emotional intensity, or closeness of a bond is often used as measure of strength of tie. Network centrality refers to how central an individual is relative to others in a network. In general, individuals with more access have more centrality. Centrality is measured by the three most common indicators of centrality: degree, closeness, and betweenness (Brass, 1995).

Network data analyzed by these measures are obtained using the standard method called as the name generator. The name generator first introduced in 1960s (Laumann, 1966, as cited in Marin & Hampton, 2007) is administered through surveys or interviews. Respondents are given one or a series of questions that elicit a list of the people with whom they discuss important matters (Burt, 2004), from whom they seek work-related information and advice (Rhee, 2004), and with whom they do social activities outside of work (Oh et al., 2004). The data collected through name generators provide individual profiles of respondents' personal network members that can be aggregated into measures of network attributes or structure, such as average tie strength, network range, and density (Marin & Hampton, 2007).

#### Advice Networks

Despite of advances in technology, majority of people still go to other people for important information and knowledge, as opposed to accessing online documents or using a manual (Cross, Borgatti, & Parker, 2001), for some reasons: 1) tacit, complex knowledge is not easily codifiable, 2) changes in context and situation often preclude the existing knowledge from being used in a new context without adaptation, and 3) some people prefer to oral information to written (Nebus, 2006). When an individual contacts others for work-related advice or information, an advice network originates.

An advice network generally refers to a task-related type of network tie through which information, advice, and aid necessary to perform a job flow. Following Sparrowe et al. (2001), this study defines advice networks as "relations through which individuals share resources such as information, assistance, and guidance that are related to the completion of their work" (p. 317). Advice networks in the organizational context serve as conduits for resources that are instrumental in facilitating individual job performance (Sparrowe et al., 2001).

The key characteristic of work-related advice networkers is that advice ties are generally weaker than other social-oriented ties such as friendship ties (Hansen, 1999; Podolny & Baron, 1997; Rhee, 2004). Because advice networks are closely linked to individual's job and role within organizations, the advice relations naturally develop and are updated over time as people seek information and advice that are associated with organizational roles (Gibbons, 2004). The value of advice networks changes over time (Podolny & Baron, 1997). For example, the value of the existing advice networks declines and the network ties are unlikely to be maintained, after individual's organizational roles or positions change. Thus, advice networks tend to be characterized by weak ties.

As mentioned above, weak ties are more efficient for obtaining new information

because they bridge local cliques, unlike strong ties that bind cliques of individuals and primarily convey redundant, within group information (Granovetter, 1973). This implies that individuals with more weak ties have greater opportunities for access to more source of valuable information. This implication of weak ties is applied to advice networks as well. For example, an individual seeks advice or information when encountering a problem or opportunity that he or she does not have sufficient confidence or knowledge to solve alone (Nebus, 2006). In that case, if the individual has larger advice networks, he or she can have access to diverse and important advice and information from the networks. Thus, the larger advice networks have a positive effect on individual job outcomes.

Burt (2004) further elaborated on the benefits of weak ties with his theory of structural holes. The term *structural holes* indicates the absence of connections among those in the network. Burt argued that an individual bridges structural holes by cultivating relationships those who are disconnected from others in ego's network. These relationships provide an individual with a rich source of novel, nonredundant information. Further, being tied to others who are less connected provides advantages in the form of access, timing, and referrals to information (Rhee, 2004). Thus, the more structural holes in individual's network, the more valuable the network is as a source of information. In particular, in that an actor's advice seeking is associated with the timing and referral benefits (Nebus, 2006), it is anticipated that the less redundant networks an employee has in his or her advice network, the more likely he or she is to obtain work-related resources and to perform better.

In addition, another value derived from bridging structural holes is to obtain

diverse information. According to Burt, networks that contain links to many different types of actors potentially contain more diverse information. For instance, actors who develop links between people with different skills, information, and experience gain access to a broader array of information and opportunities than those who tie to others with a similar background. Thus, networks that are large and diverse in range contribute to enhancing actor's capacity for creative action and further are positively related to actor's performance (Reagans & Zuckerman, 2001). As individuals increasingly seek work-related advice from diverse areas and experts (Nebus, 2006), range of advice networks are a correlate of the amount of valuable, diverse information. Therefore, it is predicted that diversity of an actor's internal advice networks facilitate his or her job performance.

#### Advice Network Development

Individuals largely accumulate advice relations and thereby generate advice networks through social interactions that may be fostered by workflows, similarity between tasks, or formal lines of communication (Gibbons, 2004). It appears that advice networks naturally develop to provide and obtain work-related information and resources. However, studies of advice networks (Borgatti & Cross, 2003; Cross & Borgatti, 2000; Nebus, 2006) argue that forming advice networks are understood as the process in which actors select persons to contact for information and retain them as a preferred future source of advice. In particular, such process is explained in Nebus's theory of advice network generation. *Choosing Advice Contacts.* According to Nebus, advice contacts are chosen by considering two baseline conditions: the potential contact's task-related expertise and non-task-related attributes of the potential contact such as willingness to share advice. An individual is inclined to contact someone for information in the face of a new problem or opportunity, if the potential knowledge that that person can provide is perceived as valuable in light of a current problem or opportunity. To decide whether one can be a valuable source of advice, an individual has to have some understanding of another's knowledge and skills of the task beforehand. Knowledge of another person's expertise is largely transmitted through information and communication technologies within an organization (Borgatti & Cross, 2003).

However, scholars assert that a particular set of employment practices can be an effective means for people to share others' work-related expertise and interest (Cohen & Prusak, 2001; Collins & Clark, 2003; Cross & Parker, 2004; Leana & Van Buren, 1999). That is, individuals may participate in employee development programs and accumulate knowledge of others' expertise and work experiences while interacting with other participants during the programs (Cohen & Prusak, 2001). Especially, such interaction based training approaches as mentoring, communities of practice, and action learning require close contact between participants, which in turn provides them with opportunities to be aware of others' expertise and to collect contact information for work-related advice.

Although an individual knows potential candidates who could offer valuable taskrelated advice, their knowledge is not really helpful if they are unwilling to share the knowledge or unlikely to respond in timely fashion. For some reasons, such as lack of motivation or time to help, people are reluctant to share information with and provide advice for a person contacted (Borgatti & Cross, 2003; Nebus, 2006). One turns to another person for advice when he or she perceives that no response is expected from the person contacted. Thus, no advice relationship is generated between the searcher and the person first contacted.

Researchers (Borgatti & Cross, 2003; Nebus, 2006; Szulanski, 1996) argue that a contact's willingness to share knowledge depends on the ease of communication and intimacy between actors. Nahapiet and Ghoshal (1998) and Cohen and Prusak (2001) posited that the relational dimension of social capital, including trust, obligation, and identification, functions as an actor's motivation to exchange knowledge. Similarly, Szulanski (1996) found that sharing best practices among employees is positively affected by trust among them. Additionally, one's trust in another encourages him or her to ask for help, despite the possibility that the one will taint his or her reputation as an expert (Borgatti & Cross, 2003) Therefore, knowledge sharing may not occur in the absence of intimacy or trust between a searcher and contact.

The close relationship between the advice requestor and contact can be built or reinforced by decreasing physical distance between them and increasing the frequency of contact between them (Cohen & Prusak, 2001; Nebus, 2006). For example, attending a meeting or conference with the person one desires to contact may increase the opportunity to interact with and form an intimacy with that person. Particular training approaches play an effective role in fostering trust between potential advice requestors and advisors. One-on-one training activities, such as OJT and mentoring, help actors build affective relationship with a potential advisor (de Jong, Thijssen & Versloot, 2001).

In addition, such training approaches as communities or practice and action learning reinforce the trust and relationship among participants through interaction and communication within the practice community (Cohen & Prusak, 2001; Lave & Wenger, 1991; Stein, 2001).

*Retaining Advice Relations.* One's interaction with the person to contact for information may only last for the duration of the advice transfer. In the case that the advice contact is not persisted beyond the last interaction, no advice network is generated. In order to form an advice relationship, an individual has to retain the person selected as a preferred future source of advice (Nebus, 2006). An actor's retention of advice contacts is affected by several factors. Yet, in general, a positive experience during the initial interaction and social attachment between advice seeker and contact are the most critical factors that contribute to the retention (Borgatti & Cross, 2003; Nebus, 2006).

After selection, an individual evaluates not only the selected contact's knowledge and skills, but also this person's willingness to help or availability to help (Nebus, 2006). If actor A knows that actor B is a poor source of information regarding a certain topic during their initial interaction, then the A's probability of contacting B for information on that topic in the future is decreased. Even though B has expertise that A needs, if A has a previous experience that B did not provide A with the response required at all or in a timely fashion, A would be unlikely to contact B for advice next time.

According to Nebus (2006), social attachment between actors is an important factor to retain advice relationships. This is because attachment allows the commitment of one party to another, which in turn enables to repeat request-response exchanges. McGrath, Vance, & Gray (2003) provided the evidence of Nebus' this argument. In the study that examined patterns and content of advice sharing networks among 20 software executives, McGrath et al. found that advice relationships were formed from strong ties relationships.

#### **Rival Independent Variables and Dependent Variables**

A significant and growing body of literature addressing the topic of social networks has appeared over the past three decades. Network studies have contributed to the investigation of a wide range of organizational topics, including organizational culture, innovation, or firm performance. Such studies have produced several antecedents and consequences of networks. This section reviews the antecedents and consequences of networks at the interpersonal level of analysis and identifies presumed rival independent and dependent variables of this study, as shown in Figure 2.3.



Figure 2.3: Antecedents and Consequences of Networks

## **Rival Independent Variables**

There are three variables that predict network behavior: actor similarity, organizational structure, and personality, shown in Figure 2.3 (Brass et al., 2004). Yet, actor similarity and organizational structure tend to be measured by the demographics such as gender, age, educational level, hierarchical position, and so on. Therefore, in this study, the first two antecedents of networks are included in demographic variables.

*Demographic Variables.* social interactions tend to take place among individual with similar social demographic and behavioral characteristics. This homophily principle is well explained by the old adage, "birds of a feather flock together." Actor similarity fosters identification with the group and a level of mutual trust, thereby making easy to communicate and socially integrate. Considerable research supports this proposition (Brass et al., 2004; Granovetter, 1973; Klein, Lim, Salts, & Mayer, 2004; Ibarra, 1992; Mehra, Kilduff, & Brass, 1998; Reagans & Zuckerman, 2001). For example, Ibarra (1992) observed two largely segregated networks based on gender in different organizational settings. In general, similarity in the network research is operationally defined on such dimensions as gender, education, race, tenure, and occupation. Actor similarity in this study is measured by respondents' gender, educational level, and years of experience at the organization.

In addition to actor similarity, organizational structure forms social networks in organizations. Network researchers including Cross, Parker, Borgatti argue that physical proximity and an organization's work flow and hierarchy of authority restrict or facilitate interaction with others, thereby influencing network patterns. For instance, formally differentiated positions locate individuals and groups in physical space at particular

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points in an organizations' hierarchy, which may in turn constrain their opportunity to interact with some others (Cross & Parker, 2004; Nebus, 2006). Although the use of telephones and email may moderate the relationship between geographic distance and interaction, proximate ties are easier to maintain and more likely to be strong (Monge & Contractor, 2003). Organizational structure factors are measured by respondents' hierarchical position and department in this study.

*Personality Variable.* The studies show that individual personality also affects personal network patterns (Brass et al., 2004). In particular, it appears that emotional instability is strongly related to network behavior, compared to other personality characteristics (Johnson et al., 2003; Klein et al., 2004; Mehra et al., 1998). For example, Klein et al. (2004) found that only emotional instability among several personality characteristics influenced the acquisition of central positions in a team' social network. Mehra et al. (2001) also found that a stable personality characteristics predicted centrality in various networks. Therefore, this study measures emotional instability as the personality variable and examine its relationship with advice networks.

#### Dependent Variables

Individual and organizational factors shape networks, whereas attitudes and behaviors change as a result of networks. Several consequences of interpersonal networks, including performance, leadership, power, get a job, and so on, have been reported. However, as shown in Figure 2.3, this study discusses three variables such as performance, job satisfaction, and turnover, which are related to individual performance outcomes of this study. *Performance*. Relationships with others have a significant impact on performance when these relationships involve the ability to acquire necessary information and expertise (Brass et al., 2004). Networks serve as important conduits that carry information and resources required for a job, which enable to perform better. A good deal of research has found a link between networks and performance in complex jobs (Collins & Clark, 2003; Cross & Cummings, 2004; Cross & Parker, 2004; Oh et al, 2004; Reagans & Zuckerman, 2001). Cross and Parker's (2004) studies conducted in consulting firms showed that well managed-networks are positively associated with firm performance. Oh et al. (2004) examined the relationship between informal socializing ties and group effectiveness in Korean companies including high-technology firms and found that intragroup closure and bridging relationships are related to group performance.

*Job Satisfaction.* Job satisfaction appears to be related to network patterns, yet there is no consensus on the relationship between interaction and job satisfaction. Leana and Van Buren (1999) argued that organizational integration promotes mutual trust and collaboration, which in turn influences organizational commitment and satisfaction. Morrison (2002) found the evidence to support this assertion in the study of the closeness of friendship ties for organizational new comers. And Roberts and O'Reilly (1979) also observed that relative isolates in an organization's communication network were less satisfied than participants. However, Brass (1981) found no relationships between network centrality and employee satisfaction. Brass et al. (2004) assumes that there may be an inverted U-shaped relationship between networks and job satisfaction, because isolation is probably negatively associated with satisfaction, while a frequent interaction with others may lead to conflicting expectations and stress. *Turnover Intention.* Turnover is also predicted by network patterns, especially when strong ties exist within a group. According to Leana and Van Buren (1999), voluntary turnover tends to occur when individuals pursue their private benefits rather than group or collective goods. A bond in a relationship fosters trust and reciprocity, which in turn leads employees to the willingness to subordinate individual desires to group objectives. A few studies support this argument. Krackhardt and Porter (1986) found that those who have a closure relationship with others were more likely to satisfy and less likely to leave in a study of fast-food restaurants. And McPherson, Popielarz, and Drobnic (1992) found that network ties within a group were associated with reduced turnover, while ties outside the group increased turnover.

#### Conceptual Framework of the Study

While there is a growing body of work on how social networks affect organizational culture or performance, there are few studies exploring how firms can support and built networks using HR practices. Especially, research on the role of training approaches on developing personal networks is rarely known. Some social capital and network researchers in corporate research argue that, since training practices provide individuals with opportunities not only to interact with others but also to become aware of others' expertise or interest, training approaches may be the primary means to support and create social networks within organizations (Borgatti & Cross, 2003; Cohen & Prusak, 2001; Cross & Parker, 2004). Yet, very littler empirical evidence supporting the claim has been provided. In this sense, to explore the relationships among training, advice networks, and performance may provide greater insight into the training design as well as behaviors organizations.

As shown in figure 2.4, this conceptual framework outlines the relationships among perceived effectiveness of network-building training approaches, the extent of advice networks, and perceived individual performance. Training approaches as discussed provide individuals with opportunities to communicate others and to build advice networks. Especially, particular training approaches, called as network-building training approaches in this study, allow people to meet those who have various background and expertise within organizations and to generate new networks. Thus, network-building training approaches perceived as effective in building networks may help individuals build large and diverse advice networks.

Since advice networks are utilized to ask help for work-related information or resource to complete work, forming larger and more diverse advice networks means that the individual is more likely to obtain resources he/she needs in a timely fashion than those who have a relatively narrow and redundant advice networks. Therefore, advice networks created through participation in network-building training may be positively associated with the improvement of perceived individual performance.

In addition to training, as reviewed, actor similarity such as gender, educational level, and so on and personal characteristics also affect forming personal networks. In order to identify the influence of network-building training approaches on the development of advice networks, the study needs to understand whether there are any other factors that may have an influence on building advice networks. In this sense, the framework includes personality and demographic characteristics variables as rival independent variables, in additional to perceived effectiveness of network-building

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training approaches.

Based on the analysis of these relationships of the variables, qualitative data collection and analysis is conducted in order to better understand the relationships among three variables and identify the key characteristics of network-building training approaches.



Figure 2.4: Conceptual Framework of the Study

# CHAPTER 3

## **METHODS**

This chapter describes the methods employed to answer the research questions of the study. The first section discusses research design. The second section describes the research setting. The third section delineates the respondent selection for the quantitative and qualitative study. The fourth explains the operationalization of variables for the quantitative approach. The fifth section discusses instrument design for both quantitative and qualitative approaches. Finally, data collection procedures and data analysis are illustrated.

### **Research Design**

A mixed method design using a primarily quantitative approach was utilized. In particular, this study selected a sequential explanatory design characterized by the collection and analysis of quantitative data followed by the collection and analysis of qualitative data (Creswell, 2003). As shown in Figure 3.1, the weight is given to the quantitative phase and qualitative results are used to explain and interpret the findings of a primarily quantitative study (Ivankova, Creswell, & Stick, 2006). Thus, the sequential explanatory design is appropriate to use when unexpected results arise from a quantitative study, or quantitative results are needed to gain a profound understanding of the findings (Morse, 1991).

Use of this design was dictated by the identified purpose of the study. The main purpose of the study was to examine the relationships among the perceived effectiveness of NBTAs, advice networks, and perceived individual job outcomes. Additionally, the study explored how the relationships are formed and their influence on job outcomes. The study used a quantitative method to identify the relationships among variables, and also a qualitative data collection and analysis to gain an understanding of the results. Thus, the sequential explanatory strategy was the most suitable method for achieving the proposed purpose of the study. Finally, an ex post facto design was used as the quantitative method, and content analysis was employed as the qualitative method.



Figure 3.1: Sequential Explanatory Design

## Ex Post Facto

Ex post facto research was used to investigate the perceived effectiveness of NBTAs on developing advice networks and to predict whether the advice networks mediate the relationship between the effectiveness of training approaches and individual job performance. Unlike an experimental study, the ex post facto method does not control the independent variables. An ex post facto study makes observations under normal field conditions to explain and predict differences that already exist between or among groups of variables. On the other hand, experimental research discovers the direct causal relationship between independent variables and dependent variables (Ary, Jacobs, & Razavieh, 2002). Thus, when experiments cannot be utilized to establish causation, the ex post facto research design must be employed.

In fact, employing the experimental method is impractical and too costly to use when examining the relationships among variables. Additionally, this study does not manipulate the independent variables, in that they occur naturally and are observed before the dependent variables are observed. The researcher needed to gain a measure of control by testing and ruling out as many rival hypotheses as possible (Miller, 2005). Likewise, an ex post facto design is able to predict dependent variables while controlling potential extraneous variables (Hair, Black, Babin, Anderson, & Tatham, 1998). After reviewing the advantages described above, the researcher decided that an ex post facto method was most appropriate for addressing the research questions identified in this study.

## Content Analysis

In this study, the source of qualitative data was derived from interviews. In order to analyze the interviews, qualitative content analysis was utilized to gather descriptive information and provide a better understanding of how training approaches support the development of advice networks within a company. Qualitative content analysis is a widely used qualitative research technique for analyzing text data (Hsieh & Shannon, 2005). This technique analyzes and interprets the content of text data through the systematic classification process of coding and identifying themes or patterns (Mayring, 2000). Content analysis examines text data in verbal, print, or electronic form, as well as recorded communication such as, interview transcripts, observation protocol, video tapes, and so on. The analytic technique encourages for a detailed review of the data in this study, and allows a researcher to interpret the content and contextual meaning of the data.

### **Research Setting**

Three criteria were used to determine a suitable research setting in this study as follows:

- A company should include individuals who are physically apart from each other, but who need group collaboration to solve a common problem or to work on the same process. Thus, forming advice relationships with others should be essential to completing their work.
- 2) A company should be involved in cutting-edge technology. This requires employees to gain knowledge and skills aside from formal training. Advice networks should provide employees the opportunity to gather the information they need to face the daily challenges that they encounter at the workplace.
- Employees should have access to the Internet and possess the proper computer skills to respond to the survey questionnaires that will be fully administered online.

With these criteria, this study was conducted in Hynix Semiconductor, Inc. of South Korea, the sixth largest semiconductor company in the world in 2008 (Suppli Website, 2009). Hynix headquarter is in Icheon, and it has a branch office in Seoul, Korea. Production facilities of the company are located in Icheon and Cheongju, Korea, the city of Eugene in the U.S., and Wuxi, China. The company also operates a global sales support network that includes twenty-six direct sales offices spread over sixteen countries. As of December 31, 2008, about 21,500 employees work for the organization. Hynix mainly produces semiconductor memory such as Dynamic Random Access Memory (DRAM) and NAND Flash memory. This company is the world's second-largest maker of memory chips in terms of market share (Hynix Annual Report, 2009).

Since semiconductor production requires large, sophisticated facilities, the firm operates several fabrication plants and business units within a manufacturing site. The business units are independent of one another, yet the employees must work together to produce the semiconductor memory. Furthermore, because product-related technology is constantly and rapidly updated, the workers are required to collaborate and communicate with groups of people who belong to other business units in order to solve problems faced at work.

The semiconductor industry is considered as one of the most dynamic and competitive industries (Velosa, 2005). While semiconductors are the basis for the electronics and IT industries, the majority of these products are sold for a few cents or a few dollars each in the global market. Since the semiconductor industry is capital intensive business, the company must continue to develop the core competency, in order to produce high margin products. Additionally, the semiconductor industry is under continual pressure to keep pace with technology. In order to sustain a competitive advantage and lead the main memory market, the firm also needs to bring cutting-edge technology to market ahead of competition.

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Facing these challenges, Hynix keeps investing in developing employee competency and knowledge through formal training approaches. Those training programs enable workers to respond to the unpredictable needs of technology and the global market. Hynix's employees also gain information about rapidly changing technology through informal learning opportunities, such as OJT. In addition to formal and informal training, the employees engage in constant dialogue and network building with others in order to develop the knowledge and skills required to cope with the daily challenges they encounter at the workplace.

The company is equipped with the Intranet software. Therefore, the online survey questionnaires were delivered to respondents via the Intranet email, allowing them to respond to the questions at their convenience. Since Hynix's employees are required to utilize a computer to do their job, it is assumed that they have above average computer skills. Furthermore, the company occasionally conducts training evaluations through a web-based survey, which, in turn, shows that the workers understand how to answer to an online survey.

Therefore, meeting these three criteria, Hynix Semiconductor Inc. was selected as a research setting for this study.

#### **Respondent Selection**

Two data sets were utilized for this study. This section explains the target population, sample size, and sampling procedure for the quantitative study, and describes the interview participants used for the qualitative study.

## Survey Participants

*Target Population.* The population in this study was Hynix's employees who have had more than one year of experience in the production facilities of the company or branch offices in Korea. Most of the employees have at minimum two years of work experience in the organization as the ongoing economic crisis results in low turnover and hiring rates. The employees constantly participate in various individual and collective training activities, which are either formal or informal in nature. Therefore, the workers are able to understand and competently respond to questions on network-building NBTAs.

*Sample size.* Hynix has approximately 16,000 employees in Korea and about 15,000 have been working for more than one year at the company. Krejcie and Morgan (1970) argued that the size of the population and amount of error determines the size of a randomly selected sample. Thus, they suggest that an optimal sample size relates to population size, specific margin of error, and a desired confidence interval. In order to represent a population of 15,000, a sample size of 375 is necessary. This study specifies a five percent margin of error with a confidence level of ninety-five percent. As a result, 375 people were randomly selected from those who were working in Korea. They were chosen from an updated employee list provided by the Hynix HRD Center.

*Sampling Procedure*. Simple random sampling was used. This means that each employee in Hynix had an equal opportunity to be selected regardless of his or her job title, age, gender, working experience, or level of education. Although certainty of representing the population is not guaranteed, the likelihood of representativeness is greater if random sampling is employed (Fraenkel & Wallen, 1996). Thus, random sampling was used to control sampling error, which occurs when the selected sample

does not represent the studied population.

In addition to sampling error, the following errors of survey research should be considered: frame error, selection error, and non-response error (Miller, 2005). First, frame error exists when there is a discrepancy between the target population and actual population from which the researcher draws the sample. In this study, frame error was controlled by using the most current employee list provided by the Hynix HRD Center.

Second, selection error occurs when certain sampling units in the population have a greater or lesser possibility of falling into the sample than other sampling units. Since all respondents in this study were employees working in the organization, selection error was controlled by checking the population list for duplicates.

Finally, non-response error is one of the major threats to web-based surveys (Miller, 2007). The threat becomes an issue when respondents cannot access the Internet, refuse to take the survey, or abandon the survey part way through. In order to reduce this threat, the study designed and administered the instruments with consideration to the factors that enhance response rate: (1) length of the questionnaire, (2) cover letter, (3) sponsorship of the questionnaire, (4) attractiveness of the questionnaire, (5) ease of completion and return, (6) interest aroused by the content, and (7) the follow-up procedures used (Ary et al., 2002).

Non-response error can also be an issue when the results from the respondents differ from the sampled people who did not respond. This type of non-response error in the study was controlled by comparing early to late respondents, since late respondents are assumed to be typical of non-respondents (Miller, 2007). This study divided the respondents into two groups. Early respondents were those who responded to the first and
second email encouraging them to participate in the online survey. Late respondents were defined as those who responded as a result of the third email. Two groups were compared with the dependent variables. T-tests indicated no statistical difference between early respondents and late respondents on perceived individual job performance (t = -.300, df = 183, p > .05), perceived job satisfaction (t = -1.591, df = 183, p > .05), turnover intention (t = 3.004, df = 183, p > .05).

# Interview Participants

As previously stated, the study employed the interview method to obtain an indepth analytical description of past network-building processes developed by training approaches. The purpose of the interview was to gather information on the interviewees' experiences, feelings, opinions, and thoughts on network behavior during and after training approaches. In order to achieve this purpose, the study interviewed individuals who have actively participated in formal and informal training approaches within the past twelve months. Therefore, eight participants who fit the following criteria were purposefully selected for the interviews:

- 1) Respondents from the quantitative sample
- Exemplary trainees recommended by the manager of the HRD center, on the basis of their participation in training programs
- Those who have participated in at least two different, formal training programs within the past twelve months

Characteristics of the qualitative sample are shown in Table 3.1. Out of the eight interview participants, seven were male, and one was female. Three were from the

research and development (R&D) unit, three from the development and manufacturing unit, and two from the marketing and sales unit. Since the average years of service in the organization was 12.8, most respondents were managers or senior managers. All participants had a Bachelor's degree or higher.

Participant	Gender	Job Level	Years of service	Education level	
R & D					
James	М	Director	14 yrs	Graduate degree	
Robert	М	Senior manager	15 yrs	Graduate degree	
Emily	F	Assistant manager	10 yrs	Bachelor's	
Development & Manufacturing					
Mike	М	Senior manager	15 yrs	Graduate degree	
Kevin	М	Manager	14 yrs	Bachelor's	
Daniel	М	Manager	10 yrs	Bachelor's	
Marketing & S	ales				
John	М	Manager	12 yrs	Bachelor's	
Tom	М	Manager	12 yrs	Bachelor's	

Table 3.1: Characteristics of Interview Participants

# Operationalization of Variables

This section describes independent, dependent, and rival independent variables designated for the quantitative research in this study. The scale of measurement and level of each variable are shown in Table 3.3. Each variable was operationalized as follows:

# Perceived Effectiveness of Network-Building Training Approaches (NBTAs)

The literature review identified a set of NBTAs designed to develop employee competency by providing participants with opportunities to interact with others during and after the training approaches. For example, the training approaches included a groupbased training session, structured or unstructured OJT program, mentoring relationship, and action learning session.

In this study, this variable referred to respondents' perception on whether NBTAs effectively provided opportunities to build advice networks. A five-point summated rating scale ranging from 1 = very ineffective to 5 = very effective was utilized to measure this variable. For the purpose of this study, respondents were asked to rate each training approach in terms of its perceived effectiveness in developing advice networks. This variable was operationally defined as the average score comprised of ten items regarding the respondents' perception of the effectiveness of NBTAs.

Additionally, principal component factor analysis, with varimax rotation, was utilized to reveal the potential component structure of the perceived effectiveness of NBTAs (Hair et al., 1998). Three factors with eigenvalues greater than 1.0 were found. As shown in Table 3.2, the factors explained 56.8% of the variance after rotation: common training approaches (CTA), training approaches within a business unit (TAB), and on-the-job training approaches (OTA). The first factor included common training approaches such as action learning, group-based training approaches, and a knowledge management system (KMS). The second factor loaded on the training approaches within a business unit (BU): technical training approaches, and informal and formal training approaches. The last factor contained on-the-job training approaches such as mentoring relationships and on-the-job training sessions.

	Factors				
	CTA	TAB	OTA		
Common Training Approaches					
5	0.84	-0.04	0.01		
6	0.77	0.13	-0.21		
4	0.66	0.03	0.29		
11	0.63	0.13	0.26		
Training Approaches within a Busin	ness Unit				
9	-0.17	0.85	0.08		
10	0.24	0.77	0.10		
8	0.39	0.41	0.06		
On-the-job Training Approaches					
2	0.10	0.03	0.76		
1	0.03	0.09	0.76		
3	0.10	0.42	0.48		
Eigenvalue	2.37	1.70	1.61		
Variance Explained	23.71	16.98	16.10		
Cronbach Alpha	0.68	0.51	0.54		

Note. GTA = common training approaches, TAD = training approaches within a business unit, OTA = on-the-job training approaches.

Table 3.2: Factor Loadings of the Perceived Effectiveness of NBTAs

# Advice Networks

In this study, advice networks referred to the relationships developed through NBTAs, which allow individuals to share the resources such as information, assistance, and guidance necessary to complete work and solve problems (Sparrowe et al., 2001). The construct included four variables: network size, horizontal range, vertical range, and frequency of interaction. To measure each variable, this study employed a name generator method (Campbell & Lee, 1991) that asked respondents to list up to five initials of individuals within their advice networks developed through training approaches in the past.

*Network Size*. This variable referred to the total number of contacts in a network (Collins & Clark, 2003). In this study, the network size was operationally defined as the total number of network contacts that a respondent lists. Since a respondent was asked to list up to five contacts, the network size ranged from 0 to 5: 0 = no contact identified on the list and 5 = five contacts identified on the list.

*Horizontal Range*. This variable referred to the total number of contacts from different business units in a network. In this study, the horizontal range was operationally defined as the total number of contacts working outside a respondent's business unit. Since a respondent was asked to list up to five contacts, this variable ranged from 0 to 5: 0 = no contact from a different department, and 5 = all five contacts from different department.

*Vertical Range*. This variable referred to the total number of contacts in superior positions in a network. In this study, the vertical range was operationally defined as the total number of contacts with a higher job level than a respondent. Respondents were

asked to select the job level of a contact using response options that ranged from 0 = lower than me, 1 = same as me, or 2 = higher than me. Since a respondent was asked to list up to five contacts, and this variable ranged from 0 to 10: 0 = all contacts with lower job level than respondent, and 10 = all five contacts with higher job level.

*Frequency of Interaction.* This variable referred to the strength of the bond between members within a network (Granovetter 1973). Respondents were asked to rate frequency of interaction with a contact using response options that ranged from 1 = a daily interaction, 2 = a weekly interaction, 3 = a bi-weekly interaction, 4 = a monthly interaction, and 5 = a quarterly interaction. The interaction frequency in this study was defined as the average number of times per month that a respondent interacted with identified contacts ranging from 0.3 to 30: 0.3 = once a quarter, and 30 =once a day.

# Perceived Job Outcomes

Perceived job outcomes referred to a respondent's perception of job outcomes in terms of the quality of work expected from individual employees, this, in turn, directly and indirectly affects an organization's profitability. This study measured perceived job outcomes using three variables: perceived job performance, perceived job satisfaction, and turnover intention.

*Perceived Job Performance*. This variable referred to a respondent's perception of his or her job performance. Tsui, Pearce, Porter, and Tripoli's (1997) items were adapted to measure the perception of individual task performance. In addition to Tsui et al.'s items, two items were added. On these questions, respondents were asked to self-rate the quantity, quality, efficiency of their work, and their expectation of promotion, when compared to other employees in a similar job. This variable was measured using a fivepoint summated rating scale ranging from 1 = strongly disagree to 5 = strongly agree. In this study, perceived job performance was operationally defined as the average score of those six items.

*Perceived Job Satisfaction.* This variable indicated the degree to which an employee is satisfied with their current job. This study adapted two items from Prince (1977) to measure employee satisfaction. Perceived job satisfaction was defined as the average score on these two items. This variable was measured using a five-point summated rating scale ranging from 1= strongly disagree to 5 = strongly agree.

*Turnover Intention*. This variable referred to an employee's intention to voluntarily leave the organization. This study adapted two items from Hom and Griffeth (1991) to measure turnover intention. The turnover intention variable was defined as the average score on these two items. The variable used a five-point summated rating scale ranging from 1 = strongly disagree to 5 = strongly agree.

	Scale of	Loval of
Variable	Measurement	Variable
DEPENDENT VARIABLES		
Perceived Job Outcomes		
Perceived Job Performance	Ordinal	1-5
Perceived Job Satisfaction	Ordinal	1-5
Turnover Intention	Ordinal	1-5
INDEPENDENT VARIABLES		
Perceived Effectiveness of NBTAs		
Common Training Approaches	Ordinal	1-5
Training Approaches within a BU	Ordinal	1-5
On-the-job Training Approaches	Ordinal	1-5
Advice Networks		
Network Size	Interval	0-5
Horizontal Range	Interval	0-5
Vertical Range	Interval	0-10
Frequency of Interaction	Interval	0.3-30

Table 3.3: Scale of Measurement and Level of Variable

## Instrument Development

Instruments for the survey and interview protocols were designed and developed by the researcher, with assistance from the academic advisor and committee members at The Ohio State University. This section describes the instruments used in the quantitative and qualitative studies and, in particular, explains how the study establishes instrument validity and reliability to control measurement error in a quantitative study.

### Survey Instruments

*Design of the Instruments*. The questionnaire used in this study consisted of five parts. The first part focused on NBTAs and contained questions regarding the perceived effectiveness of the NBTAs. The next part measured patterns of advice networks using the name generator method. The third part dealt with emotional instability, and the fourth part asked respondents to rate their perceptions of their job performance, job satisfaction, and turnover intention. And, finally, the fifth part of the questionnaire contained questions on demographics such as gender, level of education, years of service in the organization, and job level.

*Validity*. Validity refers to whether an instrument measures what it claims to measure. To establish instrument validity, the instruments were developed based on an extensive literature review of the following areas: HRD, business management, social networks, and measurements (Ary et al., 2002). Content validity was also conducted in this study.

Content validity tests the representativeness of items on the instrument as they relate to the entire domain being measured. A panel of experts reviewed the

questionnaires for content validity. The panel of experts consisted of professors, practitioners, and doctoral students. More specifically, the panel included one research method professor, one HRD professor, one Workforce Development and Education professor, two practitioners in the industry, and three HRD doctoral students. The experts were asked to review the format of the instrument, including clarity of printing, appropriateness of language, clarity of directions, as well as the appropriateness of items. Additionally, the experts were requested to provide any suggestions for improving the questionnaire's content validity.

*Reliability*. The reliability of an instrument refers to its ability to yield consistent estimates of what is assumed to be measured (Gay, Mills, & Airasian, 2005). This study conducted a test retest analysis to ensure the reliability of the instruments. The test retest reliability in the study was established by administering the same instrument to the same respondents on two different occasions. The reliability test was administered to twelve people who were not in the sample, but who were working at Hynix Semiconductor twice, two weeks apart, in order to assess the consistency of the measure. The correlation coefficient between two sets of responses was used to evaluate the test retest reliability. Table 3.4 presents the correlation coefficient results for the test retest. The test retest reliability ranged from .74 to .98. These values excel the .6 mimimum cutoff point recommended by Nunnally and Bernstein (1994).

Variable	Correlation Coefficient
Perceived Effectiveness of NBTAs	.93
Network Size	.98
Horizontal Range	.96
Vertical Range	.95
Frequency of Interaction	.96
Perceived Job Performance	.78
Perceived Job Satisfaction	.75
Turnover Intention	.92

Table 3.4: Correlation Coefficients for Test Retest of the Survey Instruments

*Translation of Instrument to Korean.* Originally written in English the questionnaires was translated into Korean by the researcher. Then, the Korean version was reviewed by three Korean Ph.D. students in the field of HRD and two Korean HRD senior managers from Hynix. They were asked to note any words or phrases in the Korean translation that were inappropriate or unclear when compared to the English version. Next, they were requested to rewrite the phrases, staying as faithful to the original version as possible. After gaining their consensus on the revisions, the Korean version of the questionnaire was refined. The revised version was translated back into English and compared to the original to determine whether any discrepancies existed between the two questionnaires.

# Interview Protocol

*Design of the Instruments.* In the interviews, semi-structured protocols were used to facilitate the interviewees' recall of experiences or thoughts on selected topics. The interview protocol was organized into three parts. The first part was comprised of questions about the interviewee's background. The second section probed the respondent's on whether training approaches were effective in developing advice networks and whether the networks helped them improve their job performance. Also, they were asked questions on when and how they could build networks during or after training approaches. The third part included questions on what would influence interviewees to build new advice relationships through training approaches. Respondents were also asked to list specific training programs that they thought would benefit from network building approaches. In addition, some questions were added or revised later, based on the quantitative findings.

*Reliability*. Reliability in qualitative research is the degree to which the research findings are independent of accidental circumstances within the research (Patton, 2001). Lincoln and Guba (1985) use the term dependability, rather than reliability, since it focuses on whether the findings are consistent. Thus, in general, reliability and dependability are interchangeable terms. To ensure reliability in qualitative research, triangulation, the use of several data sources or different methods, is crucial. The more agreement between data from different sources, the more reliable the interpretation of the data. Thus, the reliability of this qualitative approach was increased by using both quantitative and qualitative approaches (Patton, 2001).

*Validity*. Validity in qualitative research is the degree to which the finding is interpreted in a correct way (Patton, 2001). Since all interpretations are subjective, a researcher needs to address the validity of his or her interpretation of data. First, validity in qualitative research can be maximized by addressing whether the method is appropriate to the research question (Mason, 1996). Second, the validity is increased through justifying one's interpretation and through internal evaluation of one's motives for interpreting in a particular way (Miles & Huberman, 1994). In this study, these validity procedures included member checking, rich and thick descriptions of the cases, and committee auditing.

# Data Collection

An online self report questionnaire was used to collect the quantitative data, while interviews were conducted to gather the qualitative data. The data were analyzed using quantitative and qualitative techniques approaches. This section provides information on the data collection for this study.

#### Survey Data

To ensure that the rights of the respondents were protected, the quantitative study was first approved by the Human Subjects Review Committee at the Ohio State University in October of 2009. Then, in November of 2009, the senior HRD manager distributed the web-based questionnaire (Appendix A) to 375 randomly selected Hynix employees. One week after the first distribution date, the researcher asked the senior HRD manager to encourage respondents to complete the survey and to remind those who had yet to respond. Several additional phone calls were made two week and four week past distribution date. Likewise, emails were sent to the senior HRD manager to encourage him to promote to contact survey participation. The respondents could participate in the survey by clicking on the link address that led to the survey questionnaire website. After the respondents completed and submitted the questionnaire, their responses were automatically sent to the researcher's database.

# Interview Data

In October of 2009, the qualitative study was approved by the Human Subjects Review Committee at the Ohio State University. This ensured that the rights and welfare of the interviewees were protected. While data collection and analysis were being conducted, group interviews were performed in person. Two to three designated respondents participated together in each interview. The interview questions were provided in advance participants, which allowed them to prepare their responses (Lambrecht et al., 1997). Interviewees were also informed about having their interview taped. The interview conversations were recorded onto a digital recorder and transcribed for further analysis by the researcher. All interviewees were compensated with a twenty dollar gift card as a token of appreciation.

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### Data Analysis

This section discusses how the data collected from the online survey and interviews were analyzed in order to fully answer the identified research questions. After collection, the quantitative data was encoded and analyzed using STATA version 10 and SPSS version 17.0. The encoded data was checked for entry accuracy by the researcher. No encoding error was detected. Both the descriptive and correlational statistics were used according to the nature of the research questions. For the qualitative study, content analysis was utilized to analyze and interpret the interview data. Each research question was analyzed as follows:

Research Question One: What is the perceived effectiveness of NBTAs in developing advice networks?

Descriptive statistics were used to summarize the data for the perceived effectiveness of network-building training approaches. Specifically, the frequencies, means, and measures of variability (range and standard deviations) were calculated to be appropriate for the scale of measurement.

Research Question Two: What is the relationship between the perceived effectiveness of NBTAs and respondents' advice networks?

To answer the above research question, a canonical correlation analysis was employed. Although no assumptions are strictly required in canonical correlation analysis, interpretability of the canonical solution is enhanced if two assumptions are met. Hair et al. (1998) noted that these assumptions are normality (normal distribution of the noncategorical observed variables) and multicollinearity (high degree of correlation among either dependent or independent variable set). All variables were evaluated for normality and transformed if possible. Multicollinearity was tested by examining the correlation coefficients, and the variables were remedied if necessary.

After variables were assessed with regard to the assumptions, a canonical correlation analysis was conducted using the perceived effectiveness of NBTAs variables as predictors of advice networks variables. More specifically, the set of dependent variables was defined by four variables, including network size, horizontal range, vertical range, and frequency of interaction. The perceived effectiveness of NBTAs, including common training approaches, on-the-job training approaches, and training approaches within a business unit, were designated as the set of independent variables.

The derived canonical functions were examined to determine the number of canonical functions related to the interpretation stage. Next, with a set number of canonical functions deemed statistically significant and the magnitude of the canonical roots (squared canonical correlation coefficients), the researcher proceeded to make substantive interpretations on the pattern of relationships within and between sets of variables. These interpretations involved examining three methods: 1) standardized canonical coefficient, 2) structure coefficient, and 3) squared structure coefficient. Lambert and Durand (1975) suggested using items with loading values of .30 or higher in order to draw inferences about the relationships among variables in the sets. Thus, items with canonical loadings of .30 and higher were considered when interpreting relationships.

*Research Question Three: What is the relationship between respondents' demographic characteristics and the nature of advice networks?* 

In this research question, the dependent variables were the set of advice networks

variables, including network size, horizontal range, vertical range, and frequency of interactions. And the independent variables were the set of demographic characteristics including gender, level of education, job level, years of service in the organization, and emotional instability. Therefore, a canonical correlation analysis was also conducted to evaluate the relationships between two variable sets.

Normality and multicollinearity were first assessed with regard to meeting the assumptions on canonical correlation analysis, and remedies were executed if necessary. Then, a canonical correlation analysis was conducted using the demographic characteristics as predictors of the advice networks variables. With the canonical functions deemed statistically significant and the magnitude of the canonical roots (squared canonical correlation coefficients), the researcher proceeded to make substantive interpretations on the pattern of relationships within and between sets of variables. Items with canonical loadings of .30 and higher were considered when interpreting relationships.

Research Question Four: What is the relationship between respondents' advice networks and perceptions of job performance?

Since there was more than one dependent variable, a canonical correlation analysis was employed to answer this research question. The set of dependent variables was defined as follows: perceived job performance, perceived job satisfaction, and turnover intention. Advice networks were the set of independent variables. After the variables met the assumptions on canonical correlation analysis, the researcher conducted a canonical correlation analysis using advice networks as predictors of the set of perceived job outcomes. With the canonical functions deemed statistically significant and the magnitude of the canonical roots (squared canonical correlation coefficients), the researcher proceeded to make substantive interpretations on the pattern of relationships within and between sets of variables. Items with canonical loadings of .30 and higher were considered when interpreting relationships.

Research Question Five: Does the nature of respondents' advice networks mediate between the perceived effectiveness of NBTAs and perceptions of job performance?

This study tested for mediation by following the four-step procedure outlined by Baron and Kenny (1986). In step one, a hierarchical multiple regression analysis was used to determine to what extent perceived job outcomes could be predicted from the perceived effectiveness of NBTAs. The dependent and main independent variables were at the interval scale of measurement, measured by a Likert-type scale. In the multiple regression, independent variables were entered cumulatively, according to the order of rival demographic variables and the main independent variables. In doing so, a unique partitioning of the total variance in the dependent variable can be explained by the independent variable(s) added each time by R-square change (Pedhazur, 1997).

Thus, demographic characteristics were added in the first model. Dummy coding was assigned for job level. Next, all variables under the perceived effectiveness of NBTAs were introduced into the second model. The researcher determined whether each model had significant F-value and analyzed its probability. Additionally, the R-square change was examined to assess the percentage of variance accounted for by the perceived effectiveness of NBTAs controlling for demographic characteristics. Since there are three dependent variables, a separate hierarchical regression analysis was conducted for each dependent variable. In step two, a hierarchical multiple regression analysis was conducted to determine to what extent the size, range, and interaction frequency of advice networks could be predicted from the perceived effectiveness of NBTAs. The dependent variables were at the interval scale of measurement. Demographic characteristics were added in the first model. Next, all variables under the perceived effectiveness of NBTAs were added into the second model. The researcher determined whether each model had significant Fvalue and analyzed its probability. Additionally, the R-square change was examined to assess the percentage of variance accounted for by the perceived effectiveness of NBTAs controlling for demographic characteristics. Since the advice networks include four dependent variables, a separate hierarchical regression analysis was conducted for each dependent variable.

In step three, a hierarchical multiple regression analysis was conducted to determine to what extent the size, range, and interaction frequency of advice networks could predict perceived job outcomes. Both dependent and independent variables were at the interval scale of measurement. Demographic characteristics were added in the first model. Next, all the variables under advice networks were added into the second model. The researcher determined whether each model had significant F-value and assessed its probability. Additionally, the R-square change was examined to assess the percentage of variance accounted for by the size, range, and interaction frequency of advice networks controlling for demographic characteristics. Since the dependent variables include perceived job performance, perceived job satisfaction, and turnover intention, a separate hierarchical regression analysis was conducted for each dependent variable.

In the final step, a hierarchical multiple regression analysis was utilized to

examine whether the perceived effectiveness of NBTAs is significantly related to perceived job outcomes, in the presence of advice networks, and to test for mediation. Demographic characteristics were added to the first model. Next, all variables under the perceived effectiveness of NBTAs were added into the second model. Then, all variables under advice networks were introduced into the third model. The researcher determined whether each model had significant F-value and evaluated its probability. Additionally, the R-square change was examined to assess the percentage of variance accounted for by perceived effectiveness of NBTAs and advice networks controlling for demographic characteristics. Since there are three dependent variables, a separate hierarchical regression analysis was conducted for each dependent variable.

According to Baron and Kenny (1986), in order to test mediation, a researcher need to compare the relationship between the independent and dependent variables and between the independent and mediator variables. If a significant relationship between the independent and dependent variables is found, yet the dependent variable is not significantly related to the independent variable in the presence of the mediator variable in the multiple regression analysis, then it would be concluded that complete mediation has occurred. The researcher analyzed the results from steps one through four and tested for mediation.

When multiple regression analysis was used, the following assumptions were checked (Hair et al, 1998). The relationships between the independent variables and the dependent variable should be linear. Additionally, in order to meet the assumptions underlying multiple regression analysis, residuals should: (1) be independent; (2) have a mean of zero; (3) be normally distributed; (4) have constant variance; and (5) not be

correlated with the independent variables (Warmbrod, 2003).

Research Question Six: What are the processes through which respondents develop advice networks?

To answer this research question, this study followed a four-step interpretivist approach (Miles & Huberman, 1994). In the first step, the researcher read through all the interviews once and determined patterns and themes that would eventually become codes used to identify phrases or ideas. She allowed the codes to emerge while reading the interviews and kept a record of all possible codes. Sample codes included "networks based on similarity between tasks" and "forming a common interest." Then, the interviews were read, and the researcher marked the places in the interviews that reflected the codes. The third step involved organizing the coded text into categories, some texts were expended and others were combined. Finally, the study organized findings around the research question by interpreting and reanalyzing the data (Miles & Huberman, 1994). *Research Question Seven: To what extent does involvement in training programs using NBTAs encourage the development of advice networks*?

The researcher followed a four-step interpretivist approach to address research question seven. In particular, this research question was analyzed and interpreted based on three sub-categories of the NBTAs introduced in the quantitative analysis. The analysis focused on how involvement in each category of NBTAs encourages or disencourages the development of advice networks.

Thus, the researcher read through all the interviews once and identified phrases that represented three categories of NBTAs, on-the-job training approaches, common training approaches, and training approaches within a business unit. She read the interviews and marked the places in the interviews that reflected the identified patterns. Then, phrases in each category were organized by either removing them or combining them. Finally, findings were organized around the research question.

# CHAPTER 4

# **RESULTS: RESEARCH QUESTION 1-6**

This chapter presents on analysis of the data and reports the results of research question one through six. The first section describes the demographic information of the respondents. The second section continues to show the descriptive statistics for the dependent and independent variables. The third section lastly describes the survey results of five research questions.

# **Demographic Information**

The total number of respondents was 188 (50.1%) out of 375 randomly selected employees who were working in production facilities or branch offices of Hynix Semiconductor Inc. in Korea. Demographic information collected for analysis includes data on the respondents' gender, level of education, job level, years of service in the organization, and emotional instability. All respondents did not complete every item of the demographic information. Five respondents, who did not enter demographic information at all, were excluded from the analysis. Table 4.1 shows the descriptive characteristics of the respondents.

Of those who responded, 12.2 % (*n*=22) were female and 87.8% (*n*=158) were male. The majority (67.2%, *n*=121) of respondents reported having a bachelor's degree

and about 23% (n=41) identified themselves as having a graduate degree, while only about 1% (n=2) completed high school and less than 9% (n=16) reported having an associate degree. The respondents work in the high-tech industry, and such distribution of education is not extraordinary. In terms of job level, staff accounted for 13.3 % (n=24) of the respondents, assistant manager 20.4% (n=37), manager 38.7% (n=70), senior manager or higher 27.6% (n=50). The average years that the respondents have worked for Hynix was 10.9 (SD=5.95). Finally, respondents' average score on emotional instability was 2.76 (SD=0.46) that is considered lower than average score (3.7).

	Ν	Freq.	%
Gender	180		
Female		22	12.22
Male		158	87.78
Educational Level	180		
High school		2	1.11
Associate degree		16	8.89
Bachelor's		121	67.22
Graduate degree		41	22.78
Job Level	181		
Staff		24	13.26
Assistant manager		37	20.44
Manager		70	38.67
Senior manager or higher		50	27.62
	п	М	SD
Years of Service in the Org.	180	10.9	5.95
Emotional Instability	182	2.76	0.46

Table 4.1: Demographic Information of the Respondents

#### **Descriptive Statistics**

The perceived effectiveness of NBTAs and perceived job outcomes, these variables used five-item Likert scales. The study measured the nature of advice networks including network size, horizontal range, vertical range, and frequency of interaction by employing a name generator method. Table 4.2 presents the descriptive statistics for each item of the independent and dependent variables.

The respondents perceived that on-the-job training approaches (M=3.99, SD=.59) and training approaches occurring within a business unit (M=3.91, SD=.59) were more effective than common training approaches (M=3.68, SD=.61) to develop advice networks within the company. The perceived effectiveness of NBTAs are discussed in detail in the next section.

The average size of the advice network built through NBTAs was 3.27 (SD=2.02), given that the network size ranged from 0 to 5. The average range of the horizontal advice network was 2.72 (SD=1.56), given that the horizontal range ranged from 0 to 5. The average vertical range of the advice network was 4.60 (SD=2.85), given that the vertical range ranged from 0 to 10. Also, the respondents reported that they interact with the identified contacts about twice a week on average (M=7.73, SD=7.94).

In terms of individual job performance, the respondents tended to perceive that they perform their jobs slightly above average (M=3.44, SD=.47). While the respondent's perception about job satisfaction was not high (M=3.41, SD=.79), their intention to voluntarily leave the firm was low (M=2.60, SD=.97).

Variable	n	М	SD	Md	R
Independent Variables					
Perceived Effectiveness of NBTAs					
On-the-job Training Approaches	178	3.99	0.59	4	2-5
Common Training Approaches	182	3.68	0.61	3.75	2-5
Training Approaches within a Business Unit (BU)	180	3.91	0.59	4	2-5
Advice Networks					
Network Size	182	3.27	2.02	5	0-5
Horizontal Range	147	2.72	1.56	2	0-5
Vertical Range	149	4.60	2.85	4	0-10
Frequency of Interaction	146	7.73	7.94	4	0.3-30
Dependent Variables					
Perceived Job Outcomes					
Perceived Job Performance	182	3.44	0.47	3.5	1-5
Perceived Job Satisfaction	182	3.41	0.79	3.5	1-5
Turnover Intention	182	2.60	0.97	2.5	1-5

Note. *M*=Mean; *SD*=Standard Deviation; *Md*=Median; *R*=Range: 1=Strongly Disagree to 5=Strongly Agree.

Table 4.2: Descriptive Statistics of the Independent and Dependent Variables

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# Research Question One: What is the perceived effectiveness of NBTAs in developing advice networks?

Table 4.3 presents the extent to which the respondents perceived that NBTAs are effective to provide them with opportunities to build advice networks within the company. According to the means and standard deviations on each training approach, overall training approaches were perceived to be effective (M=3.85, SD=.43). In particular, the respondents reported that advice networks may be most effectively developed through a formal mentoring relationship (M=4.03, SD=.79), unplanned OJT program (M=4.05, SD=.85), and learning group (M=4.10, SD=.82). On the other hand, a Hynix Knowledge Management System (KMS) was perceived as a less effective training approach to help them create advice relations (M=3.41, SD=0.99).

Of the three variables, on-the-job training approaches, including a formal mentoring relationship, and planned or unplanned OJT programs were perceived to be helpful in developing advice networks within the organization (M=3.99, SD=.59). Correspondingly, training approaches occurring in a business unit, such as a technical training session, informal conversation and dialogue, and learning group within a business unit, were perceived to be very effective in building advice relationships (M=3.91, SD=.59). However, the respondents perceived that common training approaches, including an action learning session, group-based training sessions, and a KMS, were not as much effective as the other two training approaches to provide them for opportunities to expand advice networks (M=3.68, SD=.61).

Thus, the results showed that overall NBTAs were perceived to be effective to help individuals build advice networks within the firm. Especially, on-the-job training approaches and training approaches within a business unit were perceived to be more helpful than common training approaches for all employees.

Variable/Item	п	М	SD	Md	R
Perceived Effectiveness of NBTAs	182	3.85	0.43		1-5
On-the-job Training Approaches	178	3.99	0.59	4	2-5
A formal mentoring program conducted by a respected colleague for new employees	175	4.03	0.79	4	1-5
A planned on-the-job training program formally conducted by a designated experienced peer trainer or supervisor	177	3.91	0.77	4	1-5
An unplanned on-the-job training program informally conducted by an experienced workers	178	4.05	0.85	4	1-5
Common Training Approaches	182	3.68	0.61	3.75	2-5
An action learning project with a group of colleagues	157	3.79	0.77	3.79	1-5
A group-based training session in the Hynix HRD center	179	3.75	0.78	4	2-5
A group-based training session provided by an outside training provider	171	3.80	0.83	4	1-5
A Hynix KMS (Knowledge Management System) for seeking information required to do my job	174	3.41	0.99	3	1-5
Training Approaches within a Business Unit	180	3.91	0.59	4	2-5
A group-based technical training program provided by your division to develop work-related skills	173	3.76	0.78	4	2-5
An informal talk about how to solve a problem situation with peers during a break or lunch time	179	3.88	0.87	4	1-5
A learning group formed by colleagues in your division to develop knowledge and skills required for my work	171	4.10	0.82	4	2-5

Note. *M*=Mean; *SD*=Standard Deviation; *Md*=Median; *R*=Range: 1=Strongly Disagree to 5=Strongly Agree.

 Table 4.3: Descriptive Statistics of the Perceived Effectiveness of NBTAs

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Research Question Two: What is the relationship between the perceived effectiveness of NBTAs and respondents' advice networks?

To assess the nature and degree of relation between the perceived effectiveness of NBTAs and advice networks, a canonical correlation analysis was conducted. Pearson's product-moment correlations between all variables are shown in Table 4.4. Results revealed strong or moderate intercorrelations between the network size and two ranges of the advice network. Advice network size was strongly correlated with horizontal range (r=.63), and moderately correlated with vertical range (r=.59). For variables involved in high (r=.70) within-set pairwise correlations, potential multicollinearity problems can be occurred; this causes a less reliable interpretation (Sherry & Henson, 2005). Therefore, the offending variables need to be removed from the analysis (Hair et al., 1998). Since the correlations between the network size and horizontal and vertical advice networks were not higher than .70, there was no multicollinearity violation between these variables in this analysis.

Additionally, multivariate normality was tested using a graphical procedure for examining multivariate normality in STATA 10. If the variables are multivariate normal, the graph presents approximate a 45-degree line. Both sets of variables showed a nearly 45-degree line, and there were no normality violations.

The study used the set of three NBTAs subscales as the independent variables and the set of four advice network measures as the dependent variables. Table 4.5 summarizes the results of the canonical correlation analysis. The canonical correlation produced three functions. Of the three canonical functions calculated, only the first function explained a substantive portion of variance between the variables sets with a squared canonical correlation of 9%. However, the full model across all functions was not statistically significant using Wilks'  $\lambda = .89$ , F(12, 346.89) = 1.35, p > .05; the level of significance of a canonical correlation generally considered to be the minimum acceptable for interpretation is the .05 level (Hair et al., 1998). Although the small effects observed across the functions indicated little shared variance between the variable sets, the effect for the first function was considered substantive in the context of this study and reported. The second and third canonical functions were not significantly different from zero and accounted for less than 2% of the explained variances, thereby not interpreted.

A redundancy analysis was conducted to ascertain the percentage of variance in the observed criterion advice network variables that was explained by the independent canonical variates: canonical variates represent a linear combination of two or more variables in each canonical function (Hair et al., 1998). As shown in Table 4.5. The predictor canonical variate explained 9% of the variance in the criterion advice network canonical variate. However, the independent canonical variate was only able to predict .5% of the variance in the observed criterion variables. Also, the dependent canonical variate predicted only 3.6% of the variance in the perceived effectiveness of NBTAs variables.

Examining the standardized canonical function coefficients and structure coefficients of the predictor set in Table 4.5, common training approaches ( $r_s$ =.99) and training approaches within a business unit ( $r_s$ =.37) were relevant variables in the predictor variable set. Items with structure coefficients of .30 or higher are considered to have significant contribution to the relationship between the sets of variables (Lambert & Durand, 1975). The squared structure coefficients identified common training approaches as accounting for the most variance (98.11%) and on-the-job training approaches as accounting for the least (7.03%). Together, the pattern of common training approaches accounted for 39.52% of the variance in the predictors.

Examination of the criteria variable in Table 4.5 indicated that horizontal range was a relevant variable in the criterion set ( $r_s$ =-.38). The squared structure coefficients identified horizontal range as accounting for the most variance (14.36%) and vertical range as accounting for the least (0.65%). Together, the pattern of advice networks accounted for 5.74% of the variance in the criterions.

The relationship between the two sets of variables was largely due to common training approaches and training approaches within a business unit in the predictor set and horizontal range in the criterion set. Because the sign of the structure coefficients for horizontal range was negative, both training approaches were negatively related to horizontal advice networks. In particular, common training approaches (98.11%) accounted for considerably more of the variance in the criterion set than did training approaches within a business unit (13.41%). Nonetheless, since the full model across all functions was not statistically significant, a significant relationship between the variable sets did not exist.

Therefore, the results revealed that there was no relationship between the set of the perceived effectiveness of NBTAs and the set of advice networks.

	1	2	3	4	5	6	7
1. Network size	_						
2. Horizontal range	0.63	-					
3. Vertical range	0.59	0.41	_				
4. Frequency of interaction	0.36	-0.17	0.27	-			
5. On-the-job training approaches	-0.05	-0.05	-0.13	-0.07	-		
6. Common training approaches	0.04	-0.12	-0.03	-0.07	0.21	_	
7. Training approaches within a BU	0.08	0.00	0.03	0.00	0.26	0.24	_

Table 4.4: Correlation between the Perceived Effectiveness of NBTAs and Advice Networks

	Coef.	$r_s$	$r_{s}^{2}(\%)$	_
Advice Networks				
Network size	1.46	0.15	2.12	
Horizontal diversity	-1.43	-0.38	14.36	
Vertical diversity	-0.08	-0.08	0.65	
Frequency of interaction	-0.99	-0.24	5.84	
% of variance				5.74
Redundancy				0.50
Perceived effectiveness of NBTAs				
On-the-job training approaches	0.03	0.27	7.03	
Common training approaches	0.95	0.99	98.11	
Training approaches within a BU	0.13	0.37	13.41	
% of variance				39.52
Redundancy				3.60
Canonical correlation $(R_c)$				0.30
Canonical variance $(R_c^2)$				0.09

Note. Coef. = Standardized Canonical Function Coefficient,  $r_s$  = Structure Coefficient,  $r_s^2$  = Squared Structure Coefficient =  $(r_s)^{2*}100$ 

Table 4.5: Canonical Correlation of the Perceived Effectiveness of NBTAs and Advice Networks

Research Question Three: What is the relationship between respondents' demographic characteristics and the nature of advice networks?

Intercorrelations between demographic characteristics and advice networks are reported in Table 4.6. Results showed a very strong relationship between the job level and years of service in the organization (r=.76). Since multicollinearity can be a problem, years of service in the organization was excluded from the further analysis. Also, multivariate normality was examined using a graphical procedure for examining multivariate normality. Both sets of variables displayed a normal distribution.

In order to investigate the relationship between two sets of variables, a canonical correlation analysis was conducted. The study used the set of four demographic subscales as the independent variables and the set of four advice network measures as the dependent variables. Table 4.7 presents the results of the canonical correlation analysis.

Four functions emerged through the canonical correlation. The full model including all functions was statistically significant using Wilks'  $\lambda = .65$ , *F* (16, 388.63) = 3.68, *p* < .001). Since Wilks's  $\lambda$  represents the variance not explained by the model,  $1 - \lambda$  yields the variance explained by the full model (Hair et al., 1998). Hence, the full set of four canonical functions explained approximately 35% of the variance shared between the predictor and criteria variable sets. Of the four identified canonical functions, one was significant, and the second through fourth canonical functions were not significantly different from zero and accounted for less than 7% of the explained variances, thereby not reported.

A redundancy analysis was conducted to ascertain the percentage of variance in the observed criterion advice network variables. The redundancy indices are displayed in Table 4.7. The predictor demographic characteristics canonical variate explained 30% of the variance in the criterion advice networks canonical variate. However, the predictor canonical variate was only able to predict 6.1% of the variance in the observed criterion variables. Also, the dependent canonical variate predicted only 9.5% of the variance in the demographic characteristics variables.

An examination of the standardized canonical function coefficients and structure coefficients in Table 4.7 illustrated that the predictor set was being defined by gender  $(r_s=-.44)$  and job level  $(r_s=.99)$ , with coefficients greater than .30. Job level was the primary contributor to the predictor canonical variate accounting for 98.09% of the variance in the predictor variable set. Regarding the criteria variable set in Table 4.7, horizontal range  $(r_s=.31)$ , vertical range  $(r_s=-.66)$ , and interaction frequency  $(r_s=-.49)$  were relevant variables. Vertical range accounted for approximately 43.43% of the variance, frequency of interaction approximately 24.21%, and horizontal range approximately 9.59%. These three variables accounted for 19.35% of the variance.

Thus, the results showed that network ranges and interaction frequency were related to job level and gender. More specifically, individuals with a higher level of job are more likely to have advice network contacts from different business units, while they less likely to have advice network contacts in a higher position than them and to interact with the contacts. In terms of gender, males were more likely than females to have advice networks composed with individuals from different business units. On the other hand, males were less likely than females to develop advice relations with those in a higher position and to interact with their advice network contacts.
	1	2	3	4	5	6	7	8	9
1. Network size	-								
2. Honizontal range	0.63	-							
3. Vertical range	0.59	0.41	-						
4. Frequency of interaction	0.36	-0.17	0.27	-					
5. Gender	0.06	0.06	0.24	0.10	-				
6. Educational level	-0.07	0.00	-0.11	-0.06	-0.0835	_			
7. Job level	0.04	0.19	-0.35	-0.27	-0.38	0.0773	_		
8. Years of service in the org.	0.05	0.16	-0.24	-0.19	-0.23	-0.30	0.76	-	
9. Emotional instability	0.00	-0.06	-0.06	0.14	0.12	-0.10	-0.08	-0.01	-

 Table 4.6: Correlation between Demographic Characteristics Advice Networks

	Coef.	r <sub>s</sub>	$r_{s}^{2}(\%)$	
Advice Networks				
Network size	0.61	0.04	0.19	
Horizontal range	0.31	0.31	9.59	
Vertical range	-1.05	-0.66	43.43	
Frequency of interaction	-0.38	-0.49	24.21	
% of variance				19.35
Redundancy				6.10
Demographic Characteristics				
Gender	-0.07	-0.44	19.30	
Education level	0.11	0.19	3.60	
Job level	0.96	0.99	98.09	
Emotional instability	0.05	-0.05	0.27	
% of variance				30.31
Redundancy				9.50
Canonical correlation $(R_c)$				0.54
Canonical variance $(R_c^2)$				0.30

Note. Coef. = Standardized Canonical Function Coefficient,  $r_s$  = Structure Coefficient,  $r_s^2$  = Squared Structure Coefficient =  $(r_s)^2 * 100$ 

Table 4.7: Canonical Correlation of the Advice Networks and Demographic Characteristics

Research Question Four: What is the relationship between respondents' advice networks and perceptions of job performance?

Correlations between the sets of perceived job outcomes and advice networks are displayed in Table 4.8. Results revealed a moderate correlation between perceived job performance and perceived job satisfaction. However, since variables involved in high (r=.70) within-set pairwise correlations were not detected, multicollinearity violation cannot be a problem. An examination of multivariate normality showed approximate a 45-degree line graph, and both sets of variables displayed a normal distribution.

A canonical correlation analysis was conducted using the set of four advice network measures as the independent variables and the set of three perceived job outcomes subscales as the dependent variables. Table 4.9 presents the results of the canonical correlation analysis.

The analysis yielded three canonical functions. The full model including all functions was statistically significant using Wilks'  $\lambda = .84$ , *F* (12, 346.89) = 1.94, *p* < .05). The full set of three canonical functions explained approximately 16% of the variance shared between the predictor and criteria variable sets. Of the three identified canonical functions, one was significant, and the second through third canonical functions were not significantly different from zero and accounted for less than 4% of the explained variances, thereby not interpreted.

A redundancy analysis was conducted to ascertain the percentage of variance in the observed criterion job outcome variables. As shown in Table 4.9, the predictor advice network canonical variate explained 12% of the variance in the criterion canonical variate. However, the independent canonical variate was only able to predict 6.5% of the variance in the observed criterion variables. Also, the dependent canonical variate predicted only 2.6% of the variance in the advice network measures.

Examining the standardized canonical function coefficients and structure coefficients in Table 4.9, network size ( $r_s$ =.56) and horizontal range ( $r_s$ =.70) provided the substantive contributions in the predictor variable set. This predictor set's squared structure coefficients identified network size as accounting for 31.7% of the variance and vertical range as accounting for the least (3.8%). Together, network size and horizontal range were the key predictors of the advice network set as accounting for approximately 22.3% of the variance in the set of predictor variables.

Regarding the criteria variable set in Table 4.9, all variables, perceived job performance ( $r_s$ =.61), perceived job satisfaction ( $r_s$ =.76), and turnover intention ( $r_s$ =-.85), were relevant variables. Perceived job performance (37.43%), perceived job satisfaction (57.61%), and turnover intention (72.52%) were the contributors to the criterion canonical variate. The three variables accounted for approximately 55.9% of the variance in the observed criterion variables.

Examination of function, structure, and squared structure coefficients across predictor and criterion variable sets illustrated that job performance and job satisfaction were positively related to both the size of advice networks and horizontal advice networks. On the other hand, turnover intention was negatively associated with both the size of advice networks and horizontal advice network.

Hence, the results showed that individuals who developed a wide advice network were more likely to improve their performance and to be satisfied with their job. Also, individuals who developed advice networks composed with those from different business units were more likely to perform their job better and to be satisfied with their job. On the other hand, people who developed a wide advice network or people who produced more advice contacts from different business units were less likely to intend to leave the organization.

	1	2	3	4	5	6	7
1. Perceived job performance	_						
2. Perceived job satisfaction	0.43	-					
3. Turnover intention	-0.29	-0.38	_				
4. Network size	0.18	0.23	-0.09	-			
5. Horizontal range	0.14	0.20	-0.19	0.63	-		
6. Vertical range	0.01	0.02	0.12	0.59	0.41	_	
7. Frequency of interaction	-0.04	0.04	0.12	0.36	-0.17	0.27	_

Table 4.8: Correlation between the Perceived Individual Job Performance and Advice Networks

	Coef.	r <sub>s</sub>	$r_{s}^{2}(\%)$	_
Perceived Job Outcomes				
Perceived job performance	0.25	0.61	37.43	
Perceived job satisfaction	0.42	0.76	57.61	
Turnover intention	-0.62	-0.85	72.52	
% of variance				55.85
Redundancy				6.5
Advice Networks				
Network size	0.79	0.56	31.70	
Horizontal range	0.51	0.70	49.28	
Vertical range	-0.82	-0.19	3.78	
Frequency of interaction	-0.19	-0.21	4.36	
% of variance				22.28
Redundancy				2.60
Canonical correlation (R <sub>c</sub> )				0.34
Canonical variance $(R_c^2)$				0.12

Note. Coef. = Standardized Canonical Function Coefficient,  $r_s$  = Structure Coefficient,  $r_s^2$  = Squared Structure Coefficient =  $(r_s)^{2*}100$ 

Table 4.9: Canonical Correlation for Perceived Job Outcomes and Advice Networks

Research Question Five: Does the nature of respondents' advice networks mediate between the perceived effectiveness of NBTAs and perceptions of job performance?

In order to test for mediation and control for demographic characteristics, the researcher followed the four-step procedure outlined by Baron and Kenny (1986). In the first step, the study examined the relationship between the independent and dependent variables. The second step tested the relationships between independent and mediator variables. The third step investigated the relationships between dependent and mediator variables. Finally, in step 4, the study tested whether the independent variable is related to the dependent variables in the presence of the mediator variables.

All individual demographic characteristics would be entered in the analysis. However, as shown in the results of Research Question Three, the dependent variables were not affected by all demographic variables. Job level had an influence on the variables of advice networks and perceived job outcomes. It was also reported that gender was associated with perceived job outcomes. Therefore, gender and job level were considered as control variables for the further analysis.

Table 4.10 contains a correlation matrix for the covariates in the analysis. Results revealed no strong correlations among variables with the exception of advice networks variables. Network size was strongly related to horizontal range (r=.63) and vertical range (r=.59), which may lead to a problem of multicollinearity. Tolerance values less than 0.1, corresponding to a VIF of 10, are regarded as indicating multicollinearity (Hair et al., 1998). However, as shown in Table 4.11, the tolerance values of all independent variables are more than .30 and the variance inflation factor (VIF) values are less than 3.4. Therefore, multicollinearity cannot be a problem in the further regression analysis.

The study also tested for normality within the regression analysis by examining a plot of the residuals. If the scatter plot shows the majority of residuals at the center of the plot, this indicates that the residuals are normally distributed (Hair et al., 1998). The results of the residual analysis revealed that the data are fairly normally distributed.

After variables were assessed with regard to the assumptions of regression analysis, a hierarchical regression was conducted to answer Research Question Five. A hierarchical regression is the general approach of estimating the regression equation by considering a set of variables defined by the researcher. Especially, when a study is based on a theory that suggests a particular order in which the predictor variables should be added, a hierarchical regression is utilized for the analysis (Hair et al., 1998). This study developed the conceptual framework based on an extensive literature review and identified an order of entry for the analysis.

	1	2	3	4	5	6	7	8	9	10	11	12
1. Job performance	-											
2. Job satisfaction	0.43	-										
3. Turnover intention	-0.29	-0.38	-									
4. On-the-job training approaches	0.23	0.24	-0.23	-								
5. Common training approaches	0.19	0.09	0.01	0.21	-							
6. Training approaches within a BU	0.06	0.01	-0.05	0.26	0.24	-						
7. Network size	0.18	0.23	-0.09	-0.05	0.04	0.08	_					
8. Horizontal range	0.14	0.20	-0.19	-0.05	-0.12	0.00	0.63	-				
9. Vertical range	0.01	0.02	0.12	-0.13	-0.03	0.03	0.59	0.41	-			
10. Frequency of interaction	-0.04	0.04	0.12	-0.07	-0.07	0.00	0.36	-0.17	0.27	-		
11. Gender	-0.17	-0.06	0.11	-0.20	-0.01	-0.06	0.06	0.06	0.24	0.10	-	
12.Job level	0.34	0.32	-0.27	0.21	0.04	0.00	0.04	0.19	-0.35	-0.27	-0.38	-

 Table 4.10: Correlation among the Perceived Effectiveness of NBTAs, Advice Networks, Perceived Job Outcomes, and

 Demographic Characteristics

		Tolerance	VIF
1.	Network size	0.300	3.33
2.	Horizontal range	0.364	2.74
3.	Vertical range	0.496	2.02
4.	Frequency of interaction	0.538	1.86
5.	On-the-job training approaches	0.845	1.18
6.	Common training approaches	0.848	1.18
7.	Training approaches within a business unit	0.885	1.13
8.	Gender	0.811	1.23
9.	Job level	0.619	1.62

Table 4.11: Tolerance and VIF (Variance Inflation Factor) for All Independent Variables

Step 1

Table 4.12 shows the results of the hierarchical regression analysis for each of three perceived job outcomes as a dependent variable. Control variables were included in the first model. Results indicated that the model 1 for perceived job performance was a good fit in terms of explaining the variance of perceived job performance (*F*=8.89, *df* (2, 133), *p*<.000). Job level was statistically related to the perception of job performance in the first model ( $\beta$ =0.33, *p*<.01). Gender and job level explained 12% of the variance of perceived job performance.

Perceptions of effectiveness on three NBTAs were introduced in the second model of perceived job performance to provide a test for the relationships with perceived job performance. The independent variables explained 17% of the variance of perceived job performance (*F*=5.18, *df* (5, 130), *p*<.000). Job level was related to the dependent variable ( $\beta$ =0.30, *p*<.01). Additionally, the estimate for common training approaches was related to perceived job performance ( $\beta$ =0.15, *p*<.10). The R<sup>2</sup> change statistic was 0.05 (*p*<.000), which indicates that the contribution to the R<sup>2</sup> made by the perceived effectiveness of NBTAs is not equal to zero. Of the explained variance of perceived job performance, 5% was increased by the perceived effectiveness of NBTAs.

Next, examining the first model for perceived job satisfaction in Table 4.12, a significant linear combination of the control variables and dependent variable (*F*=8.23, *df* (2, 133), *p*<.000). Perceived job satisfaction was significantly related to job level ( $\beta$ =0.35, *p*<.01). The first model explained 11% of the variance of perceived job satisfaction.

The perceived effectiveness of NBTAs variables were added into the second model. The second model was a good fit in terms of perceived job satisfaction (F=4.60,

*df* (5, 130), *p*<.000). Perceived job satisfaction was significantly related to job level ( $\beta$ =0.32, *p*<.01) and on-the-job training approaches ( $\beta$ =0.20, *p*<.05). The independent variables explained 15% of the variance of perceived job satisfaction. The R<sup>2</sup> change statistic was 0.04 (*p*<.000). The contribution of on-the-job training approaches after controlling for gender and job level was not equal to zero. Of the explained variance of the perception of job satisfaction, 4% was increased by the independent variable.

Lastly, the first model for turnover intention in Table 4.12 revealed that a significant linear relationship between the control and dependent variables existed (*F*=5.20, *df* (2, 133), *p*<.01). Turnover intention was negatively related to job level ( $\beta$ =-0.26, *p*<.01). The first model explained 7% of the variance of intention to turnover.

On-the-job training approaches, common training approaches, and training approaches within a business unit were introduced in the second model for turnover intention. A linear relationship between the independent and the dependent variables was found (*F*=3.18, *df* (5, 130), *p*<.01). Turnover intention was negatively related to job level ( $\beta$ =-0.24, *p*<.05) and on-the-job training approaches ( $\beta$ =-0.20, *p*<.05). The independent variables explained 11% of the variance of turnover intention. The R<sup>2</sup> change statistic was 0.04 (*p*<.01). Therefore, on-the-job training approaches variable explained 4% of the explained variance of turnover intention.

In summary, the results displayed that perceived job performance was positively related to the perceived effectiveness of common training approaches. Also, perceived job satisfaction was positively associated with the perceived effectiveness of on-the-job training approaches. On the other hand, turnover intention was negatively related to the perceived effectiveness of on-the-job training approaches.

	Job Performance		Job Sat	isfaction	Turnover Intention		
Variable	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	
Gender	-0.04	-0.02	0.07	0.10	0.01	-0.02	
	(-0.47)	(-0.27)	(0.84)	(1.12)	(0.16)	(-0.18)	
Job level	0.33**	0.30**	0.35**	0.32**	-0.26**	-0.24*	
	(3.69)	(3.39)	(3.99)	(3.61)	(-2.92)	(-2.62)	
On-the-job training approaches		0.14		0.20*		-0.20*	
		(1.61)		(2.23)		(-2.19)	
Common training approaches		0.15†		0.06		0.06	
		(1.84)		(0.70)		(0.70)	
Training approaches within a BU		-0.02		-0.05		-0.02	
		(-0.24)		(-0.60)		(-0.24)	
$R^2$	0.12**	0.17**	0.11**	0.15**	0.07**	0.11**	
$\Delta R^2$		0.05**		0.04**		0.04**	
F	8.89	5.18	8.23	4.60	5.20	3.18	
Ν	136	136	136	136	136	136	

Note. Standardized coefficients are reported, with t-values in parentheses;  $\dagger p < .1$ , \*p < .05, \*\*p < .01

 Table 4.12: Regression Models to Test the Relationships between the Perceived Effectiveness of NBTAs and Perceived Job

 Outcomes

Step 2

Table 4.13 contains the results of the regression analysis for each of four dependent variables including network size, horizontal range, vertical range, and frequency of interaction. Control variables were included in each first model. First, the model 1 for network size had no linear combination of control variables and network size (F=0.57, df (2, 133), p>.10). The model explained little of variance of network size  $(R^2=0.01)$ .

The variables of the perceived effectiveness of NBTAs were introduced in the second model for network size. The second model was not significant (F=0.60, df (5, 130), p>.10). The R<sup>2</sup> change statistic was 0.02 (p>.10). The contribution of the perceived effectiveness of NBTAs after controlling for gender and job level was nearly equal to zero. Only 1% of the explained variance of network size was increased by the independent variables. The findings showed no significant relationships between network size and perceptions of three NBTAs.

Second, in Table 4.13, an examination of the first model for horizontal range revealed that a linear relationship between job level and horizontal range (*F*=4.22, *df* (2, 133), *p*<.05). Horizontal range was positively related to gender ( $\beta$ =.16, *p*<.05) and job level ( $\beta$ =.26, *p*<.01). Gender and job level explained 6% of the variance of horizontal range.

On-the-job training approaches, common approaches, and training approaches within a business unit were added in the second model for horizontal range. A linear relationship between the independent and the dependent variables did not exist (*F*=2.28, df (5, 130), *p*>.05). The R<sup>2</sup> change statistic was 0.08 (*p*>.05). The contribution of the

perceived effectiveness of NBTAs after controlling for gender and job level was not equal to zero. Yet only 2% of the explained variance of horizontal range was increased by the perceived effectiveness of NBTAs.

In the third set of models in Table 4.13, the first model was a good fit in terms of explaining the variance of vertical range (*F*=10.33, *df* (2, 133), *p*<.000). Job level was negatively related to vertical range ( $\beta$ =-.29, *p*<.01). Two control variables, mostly job level, explained 13% of variance of vertical range.

Three variables of the perceived effectiveness of NBTAs were introduced in the second model for vertical range. The model had a linear combination of the independent and dependent variables (*F*=4.17, *df* (5, 130), *p*<.01). While the estimate of job level was significant ( $\beta$ =-0.28, *p*<.01), the other independent variables were not related to vertical range. As the R<sup>2</sup> change statistic was 0.01 (*p*<.000), the contribution of the independent variables after controlling for gender and job level was close to zero. The perceived effectiveness of NBTAs explained only 1% of the explained variance of vertical range.

Finally, the first model for frequency of interaction showed a linear relationship between the control variables and dependent variable (*F*=5.36, *df* (2, 133), *p*<.01). Interaction frequency was negatively related to job level ( $\beta$ =-.27, *p*<.01). Job level and gender explained 7% of variance of interaction frequency of advice networks.

On-the-job training approaches, common approaches, and training approaches within a business unit were added in the second model. The model was not significant (*F*=2.19, df (5, 130), p>.05). None of the NBTAs variables was related to frequency of interaction. Of the explained variance in the dependent variable, 0.03% was increased by on-the-job training approaches, common training approaches, and training approaches

within a business unit. The results indicated that frequency of interaction was not affected by the perceived effectiveness of NBTAs.

Thus, the results revealed that on-the-job training approaches, common training approaches, and training approaches within a business were not related to network size, horizontal range, vertical range, and interaction frequency of advice networks developed through training approaches.

	Netwo	rk Size	Horizont	al Range	Vertica	l Range	Freq. of In	nteraction
Variable	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Gender	0.09	0.08	0.16†	0.15	0.13	0.13	0.00	0.00
	(0.94)	(0.86)	(1.74)	(1.68)	(1.55)	(1.46)	(0.01)	(0.02)
Job level	0.08	0.09	0.26**	0.27**	-0.29**	-0.28**	-0.27**	-0.27**
	(0.83)	(0.96)	(2.81)	(2.96)	(-3.36)	(-3.18)	(-3.02)	(-2.92)
On-the-job training approaches		-0.09		-0.07		-0.05		-0.01
		(-0.92)		(-0.74)		(-0.62)		(-0.06)
Common training approaches		0.04		-0.12		-0.01		-0.06
		(0.39)		(-1.41)		(-0.12)		(-0.64)
Training approaches within a		0.10		0.06		0.05		0.01
во		(1.07)		(0.68)		(0.57)		(0.06)
$R^2$	0.01	0.02	0.06*	0.08†	0.13**	0.14**	0.07**	0.08
$\Delta R^2$		0.01		0.02		0.01		0.003
F	0.57	0.60	4.22	2.28	10.33	4.17	5.36	2.19
Ν	136	136	136	136	136	136	136	136

Note. Standardized coefficients are reported, with t-values in parentheses;  $\dagger p < .1$ , \*p < .05, \*\*p < .01

Table 4.13: Regression Models to Test the Relationships between the Perceived Effectiveness of NBTAs and Advice Networks

Step 3

The results of the regression analysis for three dependent variables including perceived job performance, perceived job satisfaction, and turnover intention are presented in Table 4.14. Control variables were included in each first model. The first model for perceived job performance had a significant linear relationship between the control and dependent variableS (*F*=8.89, *df* (2, 133), *p*<.000). Job level was significantly related to the perception of job performance in the first model ( $\beta$ =0.33, *p*<.01). The control variables explained 12% of the variance of perceived job performance.

Four advice networks measures were added in the second model for perceived job performance. The second model was significant (F=3.82, df (6, 129), p<.01). Job level was positively related to the perception of job performance in the first model ( $\beta$ =0.34, p<.01). Yet, none of the variables of advice networks was related to perceived job performance. The R<sup>2</sup> change statistic was 0.03 (p<.01). The contribution of advice networks variables after controlling for gender and job level was not equal to zero. Three percent of the explained variance of perceived job performance was increased by the independent variables.

Second, the first model for perceived job satisfaction illustrated that a significant linear combination of the control and dependent variables exists (*F*=8.23, *df* (2, 133), p<.000). Perceived job satisfaction was significantly related to job level ( $\beta$ =0.35, p<.01). The first model explained 11% of the variance of perceived job satisfaction.

Network size, horizontal range, vertical range, and frequency of interaction were introduced into the second model. The second model was a good fit in terms of perceived job satisfaction (F=3.83, df (6, 129), p<.01). The perception of job satisfaction was

positively related to job level ( $\beta$ =0.35, p<.01). However, perceived job satisfaction was associated with none of the advice network measures. Nonetheless, according to the R<sup>2</sup> change statistic ( $\Delta R^2$ =0.04, p<.01), the independent variables explained 4% of the variance of perceived job satisfaction. No relationships between perceived job satisfaction and advice networks were found.

Third, the first model for turnover intention in Table 4.14 revealed that a significant linear relationship between the control and dependent variables exists (*F*=5.20, df(2, 133), p<.01). Turnover intention was negatively related to job level ( $\beta$ =-0.26, p<.01). The first model explained 7% of the variance of turnover intention.

Four advice network measures were introduced in the second model for turnover intention. A linear relationship between the independent and the dependent variables was found (F=2.63, df (6, 129), p<.05). Turnover intention was related to none of the variables of advice networks. Nonetheless, the advice network measures explained 11% of the variance of turnover intention. The R<sup>2</sup> change statistic was 0.04 (p<.01). Advice networks after controlling gender and job level explained 4% of the explained variance of turnover intention.

In sum, the results showed that none of the advice network measures was related to perceived job outcomes including perceived job performance, perceived job satisfaction, and turnover intention.

	Job Performance		Job Sati	isfaction	Turnover Intention	
Variable	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Gender	-0.04	-0.06	0.07	0.05	0.01	0.02
	(-0.47)	(-0.63)	(0.84)	(0.61)	(0.16)	(0.26)
Job level	0.33**	0.34**	0.35**	0.35**	-0.26**	-0.15
	(3.69)	(3.30)	(3.99)	(3.42)	(-2.92)	(-1.43)
Network size		0.19		0.15		-0.09
		(1.32)		(1.03)		(-0.63)
Horizontal range		-0.07		0.04		-0.16
		(-0.54)		(0.33)		(-1.22)
Vertical range		0.07		0.00		0.18
		(0.61)		(-0.01)		(1.52)
Frequency of Interaction		-0.05		0.07		0.05
		(-0.44)		(0.62)		(0.42)
$R^2$	0.12**	0.15**	0.11**	0.15**	0.07**	0.11*
$\Delta R^2$		0.03**		0.04**		0.04**
F	8.89	3.82	8.23	3.83	5.20	2.63
Ν	136	136	136	136	136	136

Note. Standardized coefficients are reported, with t-values in parentheses;  $\dagger p < .1$ , \*p < .05, \*\*p < .01

Table 4.14: Regression Models to	Test the Relationships between	Advice Networks and Perceived Job	Outcomes

Step 4

Table 4.15 shows the relationships among the perceived job performance, advice networks, and perceived effectiveness of NBTAs variables. The model 1 and 2 was investigated in Step 1, and the model 3 was examined in Step 3. The model 4 tested whether perceived job performance is related to the perceived effectiveness of NBTAs in the presence of advice networks. Table 4.15 displays that the model 4 is a good fit in terms of explaining the variance of perceived job performance (*F*=3.48, *df* (9, 126), p<.00). In the full model, perceived job performance was significantly related to job level ( $\beta$ =0.30, p<.01), on-the-job training approaches ( $\beta$ =0.16, p<.10), and common training approaches ( $\beta$ =0.15, p<.10).

According to Baron and Kenny (1986), when there are significant relationships between the independent and dependent variables and between the independent and mediator variables, if the dependent variable is not significantly related to the independent variable in the presence of the mediator variable, then it would be concluded that mediation has occurred. As shown in the results of Step 1 through 3, the study found the relationship between the perceived effectiveness of common training approaches and perceived job performance. However, none of advice network measures was related to the perceived effectiveness of NBTAs. Additionally, there were weak, positive relationships between perceived job performance and on-the-job training approaches ( $\beta$ =0.16, p<.10) and common training approaches ( $\beta$ =0.15, p<.10) in the presence of advice networks.

Thus, the results showed that no mediation occurred between the perceived effectiveness of NBTAs and perceived job performance.

	Job Performance							
Variable	Model 1	Model 2	Model 3	Model 4				
Gender	-0.04	-0.02	-0.06	-0.04				
	(-0.47)	(-0.27)	(-0.63)	(-0.51)				
Job level	0.33**	0.30**	0.34**	0.30				
	(3.69)	(3.39)	(3.30)	(2.99)				
Network size			0.19	0.13				
			(1.32)	(0.89)				
Horizontal range			-0.07	0.01				
			(-0.54)	(0.05)				
Vertical range			0.07	0.07				
			(0.61)	(0.63)				
Frequency of Interaction			-0.05	0.00				
			(-0.44)	(-0.02)				
On-the-job training approaches		0.14		0.16†				
		(1.61)		(1.79)				
Common training approaches		0.15†		0.15†				
		(1.84)		(1.74)				
Training approaches within a BU		-0.02		-0.04				
		(-0.24)		(-0.44)				
R2	0.12**	0.17**	0.15**	0.20**				
$\Delta R2$		0.05**	0.03**	0.08**				
F	8.89	5.18	3.82	3.48				
n	136	136	136	136				

Note. Standardized coefficients are reported, with t-values in parentheses;  $\dagger p < .1$ ,  $\ast p < .05$ ,  $\ast \ast p < .01$ 

Table 4.15: Regression Models to Test the Relationships among the PerceivedEffectiveness of NBTAs, Perceived Job Performance, and Advice Networks

Table 4.16 presents the relationships among the perceived effectiveness of NBTAs, perceived job satisfaction, advice networks. The model 1 and 2 was investigated in Step 1, and the model 3 was examined in Step 3. The model 4 tested the relationships between the perceived effectiveness of NBTAs and perceived job satisfaction in the presence of the advice network measures. In model 4, the independent variables explained 20% of the variance of perceived job satisfaction (F=3.47, df (9, 126), p<.001). In the model, perceived job satisfaction was significantly related to job level ( $\beta$ =0.31, p<.01) and on-the-job training approaches ( $\beta$ =0.21, p<.05).

In the results of Step 1 through 3, the study found that perceived job satisfaction was significantly related to on-the-job training approaches ( $\beta$ =0.20, p<.05). However, no relationships between advice networks and perceived job satisfaction were found. Furthermore, perceived job satisfaction was related to on-the-job training approaches in the presence of the advice networks variables ( $\beta$ =0.21, p<.05).

Thus, the results showed that no mediation occurred between the perceived effectiveness of NBTAs and perceived job satisfaction.

	Job Satisfaction						
Variable	Model 1	Model 2	Model 3	Model 4			
Gender	0.07	0.10	0.05	0.08			
	(0.84)	(1.12)	(0.61)	(0.85)			
Job level	0.35**	0.32**	0.35**	0.31**			
	(3.99)	(3.61)	(3.42)	(3.04)			
Network size			0.15	0.13			
			(1.03)	(0.87)			
Horizontal range			0.04	0.09			
			(0.33)	(0.65)			
Vertical range			0.00	0.00			
			(-0.01)	(-0.01)			
Frequency of Interaction			0.07	0.09			
			(0.62)	(0.81)			
On-the-job training approaches		0.20*		0.21*			
		(2.23)		(2.45)			
Common training approaches		0.06		0.07			
		(0.70)		(0.81)			
Training approaches within a BU		-0.05		-0.07			
		(-0.60)		(-0.82)			
$R^2$	0.11**	0.15**	0.15**	0.20**			
$\Delta R^2$		0.04**	0.04**	0.09**			
F	8.23	4.60	3.83	3.47			
n	136	136	136	136			

Note. Standardized coefficients are reported, with t-values in parentheses;  $\dagger p < .1$ , \*p < .05, \*\*p < .01

 Table 4.16: Regression Models to Test the Relationships among the Perceived

Effectiveness of NBTAs, Perceived Job Satisfaction, and Advice Networks

Table 4.17 contains the relationships among the perceived effectiveness of NBTAs, turnover intention, and advice networks. The model 1 and 2 was investigated in Step 1, and the model 3 was examined in Step 3. The model 4 tested the relationships between the perceived effectiveness of NBTAs and turnover intention in the presence of advice networks. In the model 4, the independent variables explained 15% of the variance of turnover intention (*F*=2.43, *df* (9, 126), *p*<.05). In the model, intention to turnover was negatively related to on-the-job training approaches ( $\beta$ =-0.21, *p*<.05).

In the results of Step 1 through 3, the study found that turnover intention was negatively related to on-the-job training approaches ( $\beta$ =-0.20, p<.05). However, no relationships between the advice network measures and turnover intention were found. Additionally, in the presence of the advice networks measures, turnover intention was negatively related to on-the-job training approaches ( $\beta$ =-0.21, p<.05).

Thus, the results showed that no mediation occurred between the perceived effectiveness of NBTAs and turnover intention.

	Turnover Intention			
Variable	Model 1	Model 2	Model 3	Model 4
Gender	0.01	-0.02	0.02	-0.01
	(0.16)	(-0.18)	(0.26)	(-0.07)
Job level	-0.26**	-0.24*	-0.15	-0.12
	(-2.92)	(-2.62)	(-1.43)	(-1.14)
Network size			-0.09	-0.10
			(-0.63)	(-0.70)
Horizontal range			-0.16	-0.16
			(-1.22)	(-1.19)
Vertical range			0.18	0.18
			(1.52)	(1.53)
Frequency of Interaction			0.05	0.05
			(0.42)	(0.45)
On-the-job training approaches		-0.20*		-0.21*
		(-2.19)		(-2.30)
Common training approaches		0.06		0.05
		(0.70)		(0.55)
Training approaches within a BU		-0.02		-0.01
		(-0.24)		(-0.11)
$R^2$	0.07**	0.11**	0.11*	0.15*
$\Delta R^2$		0.04**	0.04*	0.08*
F	5.20	3.18	2.63	2.43
n	136	136	136	136

Note. Standardized coefficients are reported, with t-values in parentheses;  $\dagger p < .1$ , \*p < .05, \*\*p < .01

Table 4.17: Regression Models to Test the Relationships among the Perceived

Effectiveness of NBTAs, Turnover Intention, and Advice Networks

# CHAPTER 5

# **RESULTS: RESEARCH QUESTION 6 & 7**

This chapter reports the results of the analysis and interpretation of the research question six and seven. Each section answers research question seven and eight respectively.

Research Question Six: What are the processes through which respondents develop advice networks through training approaches?

This section focused on understanding how advice networks are built through various training approaches. There were no notable differences in developing advice networks among interview participants. Particularly, they all agreed that job-relatedness is the most important key to allowing them to develop advice networks with others. Based on the content analysis, four processes which respondents created advice relations through training approaches were derived: 1) developing advice networks based on jobrelatedness, 2) sharing a common interest among others, 3) spending time doing group activities with others, and 4) spending time doing extra activities with others.

## Developing advice networks based on job-relatedness

Interview respondents stressed that advice networks are generally built based on job-relatedness. If, during training, respondents met someone who is an expert in their same field of work, they would be more likely to develop an advice relationship with that person. Personal relationships tend to be formed for a specific purpose. The end of an advice network is to gain the information or advice required to perform one's job better. In this sense, it is no wonder that individuals seek to create advice relationships with others who work in the relevant profession or have a special knowledge of their job. For example, John supported this point, "Well, a company is work-oriented. If that person is not related to your work, then you wouldn't contact him, even though he is your friend." Emily also said:

I think personal networks basically need to have some purpose to be persisted. In our company, the purpose that people usually have in building networks is related to their job. They tend to pursue convenience of working. You can train and get to know people during the training, but you can't carry on the relationships unless their job is related to yours... For your own needs, you may want to continue contact with them, but other than that, it would be impossible to make the relationships last.

For this reason, the respondents stated that training and learning approaches for employees from related departments are helpful in developing advice networks. More specifically, technical training sessions, workshops, and seminars within a business unit can be an effective means of providing opportunities to get to know others and to build advice networks. Although two individuals can share the same job title, they may not necessarily decide to form a network with each other. According to the interview respondents, one's expertise functions as the determinant in building an advice network. It is reasonable that an individual would ask for work-related advice from those who have better experience and knowledge. Thus, understanding who has the expertise and know-how required to do a job becomes the important criterion in building an advice relationship. Job-related training approaches such as technical training sessions, workshops, and seminars are effective in allowing people to grasp others' expertise. For instance, James explained the reason he is persisting advice relationships with others as follows:

The reason why I keep contact those guys is, in my point of view, because I can acquire the knowledge I don't know, and, sometimes, I can give them my information. For that reason, they could contact me first, or I could contact them. But, in most cases, they asked me for some advice on a [semiconductor] process. Robert pointed out the importance of expertise when creating an advice relationship:

I am teaching general DRAM design including DRAM CORE and contingency DRAM design. There was a person who was from a different department and didn't have enough work experience in this field. After the [technical] training session, he needed some help related to failure analysis of DRAM. He was a new employee, so he didn't have many networks to use for help. So, he emailed me and asked for advice. This would happen to me several times.

Also, Robert described his experience of discovering someone's expertise during a workshop session:

There was a workshop for part leaders within our DRAM design division. Some additional information emerged during the workshop. Also, there were some people who I wouldn't see or talk with other than at the event... I got to know someone I didn't know. I thought, "That person is doing this and that job. Well, I'd better do the job with that person next time."

John also said:

If someone informed you about something new through a seminar [within the marketing unit], you would find that is very impressive. Then, you would want to continue to ask for advice regarding his expertise.

In this way, job-related training approaches can be an effective means for employees to develop advice relationships within a company by allowing them to understand who possesses the knowledge and know-how that they need. According to the survey results in Table 4.4, job-related training approaches were perceived to be helpful in building advice networks.

#### Sharing a common interest among others

There was a consensus among the interview participants that a bond of sympathy has to develop between individuals in order to build a network. A bond of sympathy usually emerges when people from similar backgrounds come together. When people share common interests, such as work, family, or hobbies, they possess a greater possibility of becoming close. Concerning this point, Tom said:

Once he and I seem to understand each other and are about the same age, "Let's keep in touch." Even though we work in different units, I give him a phone call to

say hello... If there is a specific reason for developing a bond of sympathy during training, you may contact that person. Otherwise, well, it can't be possible [to make a relationship last].

Mike spoke out on the importance of bonding with other training participants to develop advice networks:

A person who you talk with often, see often, and do a relevant job with encourages a bond of sympathy to develop, and you can talk to him. If you have to talk with a complete stranger, how would you start the conversation? "How is your family?" or "Where is your home town?" You can ask something like that. But, for example, you may ask, "Do you know the price of DRAM lately?" to someone who shares a common interest. I mean, it would be better if there is a common interest to help us talk easily.

Kevin also said:

When they [HRD teams] design a training session, of course it is not easy for them to do, I want them to consider ages, divisions, etc. I mean, I don't like there are different ages in my training session. It would be better if people from similar backgrounds or similar divisions are together. The current system doesn't seem to support that. I think, if people from similar background gather for training, it would be easier for them to develop relationships.

Like this, common interests provide individuals with a topic to talk about with each other, thereby helping them form a personal network. As common interests can range from age to relevant jobs, positions, hobbies, and so forth, leadership training for people who possess similar viewpoint and position may be helpful in developing an advice relationship. For instance, Daniel said,

I'm a part-leader. There was a leadership program for part-leaders. We first met in the program. Later, when we met in a work setting to deal with a job and had a meeting, it was much easier for us to work together because we knew each other already.

# Spending time doing group activities with others

People can develop networks without common interests. According to the respondents, when individuals spent time doing group activities with other training participants, it was easier for them to develop networks. While common interests may not exist prior to a group activity, discussing a topic, performing an assignment, and doing team building activities together can build similar interests among participants and continue to develop personal relationships. John explained this as follows:

Suppose that you have to perform an assignment with team members. Then you would have to interact with them, and a community would be created to help with communication. You are allowed to share information with others in the community. And if the training period is six months, then your relationship with them would last for six months. I guess, in this way, social relationships would be developed.

Tom also described his experience as follows:

I took an innovation training program. An assignment was given during the training, and I had to do this assignment with the other team members. Before finishing it [the assignment], my team and I were not allowed to sleep. It was like

this especially at TPS (Toyoda Production System). We got together and did the assignment until 10 or 11pm... Through this process, we became close and built relationships.

Kevin described the importance of spending time with team members: I agree that a bond of sympathy is important in developing a network. And, in cases where you share a room or are on the same team, you are more likely to build a network with them. Even though it might be coincidence, if you interact with someone for a long time and talk with him a lot, then, you may contact him after the training is over.

Since providing people with time to do group activities and interact with each other is crucial to creating relationships, rather than using a lecture or instructor ledtraining, designing interactive, group activity-oriented training is required to support advice networks.

## Spending time doing extra activities with others.

The respondents also reported that a social gathering with participants is important for developing new relationships. This process for network building may be unique to Asian countries or Korea. In most cases where there is a retreat training program, this type of gathering occurs after the daily session. Participants become close after meeting up a few times. Thus, the interview respondents perceived that extra social meetings and activities play a pivotal role in forming personal relationships with others. For instance, Daniel described:

They [HRD teams] can provide us with the chance to have a conversation with

participants. On top of that, social gatherings easily build networks. You only need two things. One is to discuss with others, and the other is to give them money and have a cup of beer. It is perfect.

Likewise, Kevin stressed the importance of doing extra activities to develop a network:

There is a huge difference between doing and not doing retreat training. If you go away to retreat training, you have nowhere to go after the daily session. So, you can drink and talk with other participants. This time is very important. Rather than during the [training] session, after the session you can talk about the training program with others. There is a big difference between having and not having a social gathering time which is the key to retreat training.

Tom affirmed:

While doing assignments together until 10 or 11 pm, we had some beer and talked to each other a lot. In doing so, it [a network] was formed. There are good people to know. If you work together for 6 days and 5 nights or 5 days and 4 nights, you begin to understand each other.

Therefore, both retreat training and extra activities are perceived to be effective and important in becoming close and building an advice network. Research Question Seven: To what extent does involvement in training programs using

NBTAs encourage the development of advice networks?

By analyzing the qualitative data, this section provides a fuller understanding of how and why involvement in training programs using particular NBTAs encourages the creation of advice relations. The results in Table 4.3 demonstrated that the effectiveness of training approaches in forming advice relationships depends on the type of training approach and how it related to a participant's job. The interview results substantiated this finding. Therefore, the study analyzed and interpreted the qualitative contents based on the quantitative analysis.

## **On-the-job** Training Approaches

On-the-job training approaches include a mentoring relationship and planned or unplanned OJT program. As shown in the descriptive analysis results, the training approaches that take place on the job were perceived to effectively provide employees with the chance to build advice networks. The interview results supported this finding. Six out of the eight interviewees agreed that mentoring and on-the-job training programs help individuals, especially new employees, build relationships with colleagues and allow them to ask for job-related advice. For example, Robert described that a mentoring relationship offers new employees opportunities to develop the networks required to do a job:

You know, new employees usually don't know what they need, which networks they should use, who they need to know, what information they need, and who they need to look for to get their job done. The networks they need are widened
through a mentoring relationship.

Tom explained how a mentee can form new networks through a mentoring relationship:

Mentoring or OJT are usually a one-on-one experience. Those are actually the most effective in building networks. During mentoring, a mentor's role is not only to teach what he knows. That is not a mentor. As a mentor, you need to introduce the mentee to this and that person. In doing so, you can give him an opportunity to acquire know-how that you don't know through other persons.

James also stressed the importance of a mentoring session in developing networks, "Sure. Especially for new employees, a mentor-mentee relationship has a big influence on building networks."

#### Common Training Approaches

The results of Research Question One showed that common training approaches which include action learning sessions, group-based training programs, and a KMS are less effective in building networks when compared to on-the-job training approaches and training approaches within a business unit. This find was consistent with the interview results. The interview participants insisted that group-based training does not help individuals create new networks. For instance, Daniel said, "For a one-way instructor-led training or a class lecture, I think it is hard for people to build networks." And John described the difficulty in the development of an advice network through common training for all employees, "Things like a training program for all employees are interesting, and participants have fun together during training, but, after training is over, everything's forgotten. I can't remember what I've learned, even a personal network."

The interview results showed several reasons why common training approaches may not help develop new relationships. First, group-based training approaches are, in general, conducted in the form of a lecture or instructor-led training. Therefore, it is perceived that there is little opportunity to get to know other participants during training. Kevin said, "If you just sit down and listen to a lecture, all you do is listen. In that case, there is no chance to talk or interact with others."

Tom felt the same way:

When you go to training, I mean, lecture-based training, the chance to talk and interact with others is rarely given to you. What you do is sit down, and when it is over, you say "good bye" to the others. Again, the next day you come to training at 8:30am and go home at 5pm when it is over. There is little chance of developing relationships.

Next, the respondents stated that common training approaches which last only a few hours or days do not give enough time to interact and communicate with other trainees. Concerning this, Emily said, "Training programs may give you a chance to make acquaintances and become close, but I don't think you can possibly get close to anyone in a short period of time." And, Daniel explained, "One-or two-day training courses are not enough [to get to know each other]. Even though you may take a one-week training program, things are forgotten as time goes on."

Robert spoke out on the difficulty in building relations with other participants in a short period of training time:

In a short period of time, it is really hard for me to develop a bond of sympathy

[between members in the group]. Besides, I can build an advice relationship with someone outside of a training session. So, there is very little [classroom] training that is considered helpful in building networks.

Finally, the interview respondents declared that it is barely possible for trainees to become close during common training, because common training tends to be comprehensive and related to overall knowledge rather than job-specific knowledge. Although common training approaches bring together people from different backgrounds and business units, the lack of job-related content or common interests between participants serves as a barrier to creating bonds.

Tom described his experience with a general training approach: When I went to training, there were many people from other divisions. The content of the training program was too general, and there was no specialized knowledge presented. It was not good. I couldn't possibly develop networks, in those circumstances.

Daniel explained the difficulty in developing relationships in a common training program:

You may have to take some training programs generally offered to all employees, even though you don't want to. Participants in these programs are likely from different jobs and business units, and you cannot easily find common interests. It is really hard to get close to these people.

Mike also said:

They [other training participants] are just forgotten. There is no bond of sympathy, and we have nothing in common. Even though we took the same training course, and I know the others by sight, I would just pass them by.

For a Hynix KMS, the interviewees perceived it as a place for sharing and exchanging their knowledge, rather than a place for building networks. Employees use the KMS to exchange or obtain information required for doing their job, but their information sharing is a one-time event. That is to say, they may ask a job-related question to someone in the expert pool, and the expert may reply to the question. However, the advice relationship with the experts seldom persists after the even. As a result, the KMS may help employees acquire information, but it is not useful in developing networks.

#### Training Approaches within a Business Unit

According to the results of Research Question One, training approaches that occur within a business unit were perceived to be as effective as those that take place on the job. The interview results reflected this find. Training approaches within a division include technical training sessions, seminars, workshops, communities of practice (CoPs), and informal learning activities. Compared to common training approaches for all employees, these types of training approaches are characterized by job-related content among participants; this allows participants to develop bonds with each other, and create advice networks.

For example, Daniel said, "In a workshop within my business unit, there is a common interest among the members. So, it is possible for me to continue to communicate with them." John described the possibility to built advice relationships through a seminar within his unit, "If an individual informed you about something new through a seminar [within the marketing unit], you would find that it is very impressive. Then, you would continue to ask him for advice regarding his expertise."

In addition, James demonstrated how an advice network can be created through a technical training course:

Because I'm a diffusion process engineer, I don't have much knowledge about the lithography process. I can get to know a lithography process engineer in a technical training class. I can take his class as a trainee, and a relationship with him can be created. Of course, I can ask him for advice later.

Robert described his experience developing an advice relationship through a workshop within his division:

There was a workshop for part-leaders within our DRAM design division. Some additional information emerged during the workshop. Also, there were some people you would not normally see or talk with, other than at the event... I got to know someone I didn't know. I thought, "Oh, that person is doing this and that job. Well, I'd better do this job with that person next time."

# CHAPTER 6

# SUMMARY, DISCUSSION, AND IMPLICATIONS

This chapter consists of three sections. The first section summarizes the results of the study. The second section presents the discussion of the research findings of this study. The final section addresses the implications of the study for both research and practice.

# Summary of Results

The following statements summarize the results for each research question:

Research Question One: What is the perceived effectiveness of NBTAs in developing advice networks?

- Overall, NBTAs were perceived to be effective in providing individuals with opportunities to build advice networks.
- On-the-job training approaches and training approaches within a business unit were perceived to be more helpful than common training approaches.

Research Question Two: What is the relationship between the perceived effectiveness of NBTAs and respondents' advice networks?

• No relationship was found between advice networks and the perceived effectiveness of NBTAs.

Research Question Three: What is the relationship between respondents' demographic characteristics and the nature of advice networks?

- Respondents with a high job level were more likely to develop a horizontal advice network, which is composed of individuals from different business units, through NBTAs.
- Respondents with a high job level were less likely to develop a vertical advice network, which is composed of individuals in a higher position than them, through NBTAs.
- Respondents with a high job level were less likely to interact with contacts in their advice networks developed through NBTAs.
- Males were more likely than females to develop a horizontal advice network through NBTAs.
- Males were more likely than females to develop a vertical advice network through NBTAs.
- Males were more likely than females to interact with contacts in their advice networks developed through NBTAs.

Research Question Four: What is the relationship between respondents' advice networks and perceptions of job performance?

- The size of advice networks developed through NBTAs was positively related to the perception of job performance
- The size of advice networks developed through NBTAs was positively related to the perception of job satisfaction.

- The size of advice networks developed through NBTAs was negatively related to intention to leave the organization.
- The horizontal advice network was positively associated with the perception of job performance.
- The horizontal advice network was positively associated with the perception of job satisfaction.
- The horizontal advice network was negatively related to turnover intention.
- No relationship was found between vertical advice networks and perceptions of job outcomes.
- No relationship was found between interaction frequency with the advice contacts and perceptions of job outcomes.

Research Question Five: Does the nature of respondents' advice networks mediate between the perceived effectiveness of NBTAs and perceptions of job performance?

- No mediation occurred between the perceived effectiveness of NBTAs and perceived job performance.
- No mediation was found between the perceived effectiveness of NBTAs and perceived job satisfaction.
- No mediation existed between the perceived effectiveness of NBTAs and turnover intention.

Research Question Six: What are the processes through which respondents develop advice networks?

• Four processes by which interviewees created advice networks through training approaches were identified as follows: 1) developing advice networks based on

job-relatedness, 2) sharing a common interest among others, 3) spending time doing group activities with others, and 4) spending time doing extra activities with others.

Research Question Seven: To what extent does involvement in training programs using NBTAs encourage the development of advice networks?

- On-the-job training approaches helped individuals, especially new employees, build advice relationships with experienced workers and peers.
- Common training approaches for all employees were not effective in developing advice networks, because they offer little opportunity or time for employees to get to know each other during training.
- Training approaches within a business unit were characterized by high jobrelated content among participants, which allowed participants to develop bonds with each other, and build advice relations.

#### Discussion

The results showed that no mediation occurred between the perceived effectiveness of NBTAs and perceptions of job outcomes. However, the findings suggested that NBTAs help individuals develop advice relations, and these advice networks have an impact on job performance and job satisfaction. The following discussion provides possible interpretations of the results of the study.

### Perceived Effectiveness of NBTAs

There has been some discussion about whether particular training approaches may serve to promote personal networks (Cohen & Prusak, 2001; Cross & Parker, 2004). For example, Cohen and Prusak (2001) argued that on-the-job training sessions, mentoring relationships, orientation programs, and intensive training programs may play an important role in connecting people from different parts of a company. Cross and Parker (2004) stated that communication forums, orientation programs, and periodic face-to-face meetings improve network connectivity in a firm. In addition, Lesser and Prusak (1999) and Cross (2006) pointed out that CoPs and informal conversations can also be regarded as important inspiration for cultivating networks.

In this study, the concept of NBTAs was developed to provide closer understanding of training approaches in terms of social networks. The study borrowed two dimensions from Jacobs and Park's (2009) conceptual framework of workplace learning and classified four types of training approaches that represent workplace learning within organizational settings. From these types of training approaches, this study derived NBTAs that are a set of training approaches that promote learning through relationships in either a formal or informal setting. Representatively, NBTAs included mentoring relationships, planned and unplanned OJT sessions, group-based training programs, CoPs, informal conversations and so forth. The construct of NBTAs was reviewed by content experts composed with professors and practitioners in order to establish its face and content validity.

This study measured the perceived effectiveness of NBTAs to ascertain whether NBTAs influence the development of advice networks. The results of the descriptive analysis showed that NBTAs were perceived to be effective in providing opportunities to build advice relationships. Especially, this study found that on-the-job training approaches and training approaches within a business unit were more effective than common training approaches at developing advice relationships. The interview results explained this finding. Since individuals build and maintain advice networks to acquire the resources needed to perform their jobs (Nebus, 2006; Podolny & Baron, 1997; Sparrowe et al., 2001), the development of advice networks depends upon whether a training approach offers an individual the chance to interact with people who directly related to their work.

On-the-job training approaches and training approaches within a business unit are directly related to a job, and participants with job-related content tend to gather to learn. Job-relatedness allows people to communicate easily and become close with each other. This may be particularly true for on-the-job training programs and mentoring relationships, because they provide the opportunity for novices and mentees to get to know peers and experienced workers (Cohen & Prusak, 2001). As a result, advice networks are the by-product of training approaches.

On the other hand, for common training approaches, the lack of job-relatedness among participants keeps them from creating and persisting advice relationships with each other. Moreover, when the training approaches are implemented through lectures or instructor-led sessions, they are less likely to provide opportunities for trainees for to become close to each other. Intensive training sessions for several weeks, group activities, discussion among trainees, and periodic face-to-face sessions can aid in developing advice networks through common training approaches (Cohen & Prusak, 2001; Cross &

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Parker, 2004).

The common training approaches may be less related to NBTAs, though the interview results showed that such common training approaches as leadership programs and intensive training sessions were helpful in developing relationships as much as the other two training approaches. Therefore, the efforts to identify and clarify the NBTAs construct are required for network research in the field of HRD.

#### The Relationships between Perceived Effectiveness of NBTAs and Advice Networks

The study found no relationships between the perceived effectiveness of NBTAs and advice networks. One possible interpretation of the result may be that there are no relationships between the perceived effectiveness of NBTAs and advice network measures. However, as outlined in the literature review, the lack of relationships between the two sets of variables contradicts the argument that training approaches may help employees create social networks within an organization (Cohen & Prusak, 2001; Cross & Parker, 2004; Leana & Van Buren, 1999; Lesser & Prusak, 1999). There are potential reasons that no relationships were detected.

First, this discrepancy may be because the measurement properties of the instrument were not sufficient for the study. The instrument scale used to measure the perceived effectiveness of NBTAs may not have been adequate to account for the variable. This study utilized a five-point Likert-scale, and 50% of the survey respondents rated 4. The lack of variance in data may keep reduce significant results in a statistical analysis.

Second, this finding may also suggest that theoretical assumptions made in this

study were inappropriate. One potentially flawed assumption relates to advice networks. Advice networks can be created and supported by numerous HR practices and systems within an organization (Collins & Clark, 2003; Cross & Parker, 2004; Leana & Van Buren, 1999). Therefore, narrowing down training approaches and advice networks into strictly a direct relationship is complex.

Finally, the lack of relationship may be due to the target population of this study. Within the population, the ratio of male to female workers was about eighty-five percent male and about 15% percent female (Hynix Annual Report, 2009). Additionally, the ongoing economic crisis resulted in low hiring numbers. Therefore, there are a considerable number of middle-level managers. Thus, as shown in the results of the study, since gender and job level are strongly related to advice networks, the weak relationships between the perceived effectiveness of NBTAs and advice networks may not have been detected.

#### The Relationships between Advice networks and Perceived Job Outcomes

The results first showed that the size of the advice network and horizontal advice networks were positively related to the perceptions of job performance. Individuals whose advice networks were large and diverse had a higher level of perceived job performance. This finding adds to the growing evidence that network size and range have an impact on individual job performance (Collins & Clark, 2003; Cross & Cummings, 2004; Oh et al., 2004; Reagans & Zuckerman, 2001).

A majority of people in knowledge-intensive work go to other people for information. According to Cross (2006) and Nebus (2006), this is not only because tacit, complex knowledge is not easily shared and transferred, but also because changes in context and situation often preclude the existing knowledge from being used in a new context without adaptation. Thus, advice networks are a potentially rich source of information, advice, and aid necessary to perform a job. Individuals whose advice networks are structured to maximize information and resource gathering are able to possess a job or occupational advantage (Collins & Clark, 2003).

Networks differ in size and diversity (Burt, 2004). Large networks are potentially, but not necessarily, diverse (Granovetter, 1982). In general, larger networks contain more capacity for information than smaller networks (Burt, 2004; Granovetter, 1982). In addition, networks that contain links to different types of contacts are more efficient in obtaining diverse and novel information. Hence, advice networks that are large and diverse provide an individual with an information advantage, which, in turn, has an effect on their job performance.

Second, the results of the study also found that the perception of job satisfaction was positively related to the size and horizontal range of advice networks. This result may support Roberts and O'Reilly's (1979) finding that job satisfaction is directly related to whether an individual is isolated or integrated in an organization's communication network. Individuals who have wider and more diverse advice networks may feel more job satisfaction by communicating with others. However, as mentioned, there is no consistent evidence supporting the relationship between networks and job satisfaction.

Finally, the results suggested that advice networks that are large and horizontally diverse led to lower turnover intention. In general, when strong ties exist within a group, turnover intention is predicted through network patterns (Krackhardt & Porter, 1986;

McPherson et al., 1992). Yet, advice networks are generally characterized by weak ties (Hansen, 1999; Podolny & Baron, 1997; Rhee, 2004). Turnover intention tends not to be predicted by the weak ties of advice networks. One possible interpretation of this result relates to job satisfaction.

Similar to the relationships between advice networks and perceived job satisfaction, advice networks that are large and diverse provide individuals with opportunities to communicate with others and access to valuable information, which in turn give them more job satisfaction. Such job satisfaction may lower their intention to leave the organization. However, no research supporting the relationship between advice networks and turnover intention has been conducted.

#### Mediation between perceived effectiveness of NBTAs and perceived job outcomes

Since no relationships between the perceived effectiveness of NBTAs and advice networks were detected, the study found no mediations between the perceived effectiveness of NBTAs and the perceptions of job outcomes. The results suggested that the perceived effectiveness of NBTAs did not lead to higher perceptions of job outcomes, measured in job performance, job satisfaction, and turnover intention, through the development of advice networks. Potential reasons that no mediations were detected in this study are similar to the issues raised in the relationship between the perceived effectiveness of NBTAs and advice networks. The measurement properties of the instrument, flawed theoretical assumptions, and the characteristics of the target population may have contributed to no mediation being identified.

#### Implications

This study provides a deeper understanding of whether particular training approaches help individuals develop advice relations, and whether those training approaches lead to better individual job outcomes through the development of advice networks. Although the study failed to find that the perceived effectiveness of NBTAs was related to the advice network measures through a correlation statistics, the results of a descriptive analysis were consistent with the results of the literature review that NBTAs are effective to develop advice relationships within an organization.

The results of the study showed that the perceived effectiveness of NBTAs was associated with perceptions of job outcomes that include job performance, job satisfaction, and turnover intention. In particular, perceived job performance was related to the perceived effectiveness of common training approaches, and perceived job satisfaction and turnover intention were related to the perceived effectiveness of on-thejob training approaches.

This study also found that advice networks built through training approaches were related to perceptions of job outcomes. Specifically, large and diverse advice networks led to high perceptions of job performance and job satisfaction and lower turnover intention. Therefore, the nature of advice networks did not mediate between the perceived effectiveness of NBTAs and perceptions of job performance, yet the perceived effectiveness of NBTAs and the nature of advice networks were related to perceptions of job outcomes respectively.

In addition to the quantitative findings, the interview results of this study help gain a fuller understanding of how advice networks are developed through training approaches. In short, this study explored how advice relations are built during training and how some relationships persist after training and the others do not. Based on the results from the data analysis, discussion, and literature review, a revised conceptual framework is displayed in figure 6.1.



Figure 6.1: The Revised Conceptual Framework

#### Implications for HRD researchers

This study provides the basis for future research in many directions. These findings can be examined in several broad areas related to social capital and network.

First, this study explored the relationships among training approaches, the development of advice networks, and individual job outcomes within a firm. There are several types of social networks, including advice networks in terms of the content conveyed through ties (Podolny & Baron, 1997). In particular, a few network studies show that informal social ties affect performance and career development. For example, Oh et al. (2004) found that informal networks are positively related to individual and group performance. Therefore, further research can be conducted to identify how training approaches and HRD practices can aid in the development of informal networks, thereby improving job performance. In particular, studies on informal networks have an important implication for many Asian cultures, as informal social relationships are certainly important for successful task performance in Asian countries such as Korea and Japan.

Second, the study was a field study in which the survey measures of the perceived effectiveness of NBTAs, advice networks, and perceived job outcomes were collected concurrently. It is not possible to prove causality between constructs. Therefore, future research should focus on collecting longitudinal data to test the predictive relationship between the independent and dependent variables. Furthermore, although this study did not support the mediation between the NBTAs and job performance, further research, such as quasi-experimental studies, is required to determine the relationships between the independent and mediating variables.

Third, this study focused on links between the perceptions of comprehensive

NBTAs and advice networks, but there are multiple training strategies and approaches by which firms can develop and manage advice networks. As explained in the descriptive results, each training approach was perceived to be effective in varying degrees developing advice relations. Thus, future research should examine the role of each training approach and strategies in creating social networks within an organization.

In addition, this study was conducted on all employees in an organization. Yet, the pattern for developing advice networks differs in terms of position, job, and type and size depending on the firm. According to Cohen and Prusak (2001), personal networks within a firm can be better developed through orientation programs or on-the-job training sessions where the individuals are new hires. Consequently, future studies should consider the above variations when examining the development of networks through training approaches.

Fourth, the study was conducted using a company in the semiconductor industry, and environmental turbulence in the industry appears to be increasing. While the relationships may be predictive of similar types of firms, it is unclear whether this same conceptual framework would be predictive for a sample of firms, whose environments may be less dynamic (Collins & Clark, 2003). For example, advice networks tend to be more developed and used in knowledge-intensive work, not only because tacit, complex knowledge is not easily codifiable, but also because changes in context and situation often preclude the existing knowledge from being used in a new context without adaptation (Cross, 2006; Nebus, 2006). Hence, future research should examine a broader range of organizations to identify potential moderators of the relationships among training approaches, networks, and firm performance. Fifth, this study only measured the structures of networks and tested the relationships among the independent, dependent, and mediating variables. Network structure is only one attribute of social capital. Substantial HR researchers, including HRD scholars, conduct studies that examine how HR practices manage and support many attributes or dimensions of social capital (Cohen & Prusak, 2001; Leana & Van Buren, 1999; Nahapiet & Ghoshal, 1998). However, most of those studies stay within the framework of theoretical argument. Thus, research thrust should be used to expand the notions of social capital and training approaches. In particular, future empirical research is needed to unpack the relationships between social capital and training approaches. Additionally, scholars must put forth effort to clarify the constructs of social capital and to invent a measure for social capital in HRD.

#### Implications for HRD practitioners

One contribution of this study for HRD practitioners is to call attention to the relationships among training approaches, networks, and individual performance. As organizations face increasing change, and knowledge develops into a critical feature of organizational performance, the role of personal networks becomes important in helping individuals perform their job. Due to a lack of empirical evidence, mangers and practitioners rarely attempt to strategically build and support networks. Yet, by showing that there are positive relationships between advice networks and perceptions of individual job performance, this study helps HRD practitioners and managers understand the importance in investing in training approaches to develop advice networks.

The interview results of this study suggest how advice relations are created

through training approaches. The data provides HRD practitioners with important ideas to help them design, develop, and implement training sessions for supporting advice networks. For example, in common training approaches for all employees, the lack of job-related content among participants undermines social relationships. By providing various group activities and discussions, designing intensive training sessions, offering free time to talk with other participants, and so forth, the development of social networks can be promoted through general training approaches. Furthermore, HRD practitioners should consider on-the-job training approaches including OJT sessions and mentoring relationships as important means for new hires to create personal networks.

NBTAs selected in this study were not originally designed and developed to help participants to develop social networks. Rather, the primary objective of those training approaches was to develop employee competence. Networks were a by-product of the training approaches. In this sense, the affect of the training approaches in building social relations may have been minor, and the study could not detect any relationships between the perceived effectiveness of NBTAs and advice relations. In order to maximize the development of social networks, HRD practitioners and functions should design and develop network-building training sessions that aim to help individuals develop their personal networks and strive to strategically connect people from different business units within a firm.

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# APPENDIX A

# SURVEY QUESTIONNAIRE (English Version)

# Training Approach and Advice Network Survey

We are pleased to invite you to respond to this anonymous web-based survey conducted by The Ohio State University. The purpose of this study is to determine whether different training approaches influence how employees interact with each other.

It will take about 10-15 minutes to respond to the questionnaire. No personal information will be requested in this survey, and all responses will be kept confidential. Only aggregate data will be reported in the study results. Your participation is voluntary, and you may skip any question you do not wish to answer. You may be contacted for an interview at a later date.

Your participation is important and will contribute to our knowledge of human resource development. Please complete the survey and submit it by **December 15, 2009**.

If you have any questions or concerns about the survey, please contact Ronald Jacobs (jacobs.3@osu.edu) or Sun Ok Hwang (hwang.180@osu.edu).

Thank you so much for your participation in this survey in advance!

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# Part I. Effectiveness of network-building training approaches

The section asks you questions on <u>training approaches</u> in which you have participated **within the past 12 months**. For training approaches in which you have participated, please check the appropriate number in the right columns.

Note. <u>Advice network</u> refers to people who you find when looking for the information or advice needed to perform your job. For instance, you need to adjust budget already established, but you don't know how to do it. Then you may look for right people to obtain advice. The person who you find for advice is included in your advice network.

How effectively the following training approaches provided you opportunities to build advice networks within the company?

		N/A = Not applicable					
		Very ineffective		Very effective			
1.	A formal mentoring program conducted by a respected colleague for new employees	1	2 3	4	5	N/A	
2.	A planned on-the-job training program formally conducted by a designated experienced peer trainer or supervisor	1 1	2 3	4	5	N/A	
3.	An unplanned on-the-job training program informally conducted by an experienced workers	1	2 3	4	5	N/A	
4.	An action learning project with a group of colleagues	1	2 3	4	5	N/A	
5.	A group-based training session in the Hynix HRD center	1	2 3	4	5	N/A	
6.	A group-based training session provided by an outside training provider	1	2 3	4	5	N/A	
7.	A group-based technical training provided by a business u in Hynix to develop work-related skills	nit 1	2 3	4	5	N/A	
8.	An informal talk about how to solve a problem situation with peers during a break or lunch time	1	2 3	4	5	N/A	
9.	A learning group formed by colleagues in your business ut to develop knowledge and skills required for my work	nit 1	2 3	4	5	N/A	
10.	A Hynix KMS (Knowledge Management System) for seeking information required to do my job	1	2 3	4	5	N/A	

N/A = Not applicable
### Part II. Advice networks built through training approaches

In this section, you will be asked to provide information about advice network that you built through training and learning activities mentioned earlier in the past 12 months.

Direction:

- 1. If you have met people during the learning process mentioned earlier and been contacting to ask job-related advice from them, please list up to <u>5 initials</u> of them. "Job-related advice" may include information, assistance, and resource that help you complete your work.
- 2. Next, check the appropriate box in the columns to the right of the initials.

Note: If two or more people have the same initials, provide the initials followed by a number to distinguish between them (example: K and K2)

	A. Person's Initials	B. Work setting		C. Position level of the person			D. Frequency of contact with the person					
		Works within my department	Works outside of my department	Lower than me	Same as me	Higher than me	Daily	Weekly	Bi- weekly	Monthly	Quarterly	
e.g.	K		$\checkmark$		$\checkmark$				$\checkmark$			
e.g.	K2	$\checkmark$				$\checkmark$	$\checkmark$					
1												
2												
3												
4												
5												

#### Part III. Personality Test (Emotional instability)

This section contains phrases describing people's behaviors. Please use the rating scale next to each phrase to describe how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age.

Strongly disagree = 1, Disagree = 2, Strongly agree = 5	Neither agre	Ag	Agree = 4,		
1. I am relaxed most of the time.	1	2	3	4	5
2. I seldom feel blue.	1	2	3	4	5
3. I get stressed out easily.	1	2	3	4	5
4. I worry about things.	1	2	3	4	5
5. I am easily disturbed.	1	2	3	4	5
6. I get upset easily.	1	2	3	4	5
7. I change my mood a lot.	1	2	3	4	5
8. I have frequent mood swings.	1	2	3	4	5
9. I get irritated easily.	1	2	3	4	5
10. I often feel blue.	1	2	3	4	5

### Part IV. Perceived Individual Performance

In this section, you will be asked to provide information about your job performance. Please read the following questions carefully, and check the appropriate number the below.

Strongly disagree = 1, Disagree = 2, Neither agree nor disagree = 3, Agree = 4, Strongly agree = 5

1.	My work efficiency is much higher than average	1	2	3	4	5
2.	My standards of work quality are higher than the formal standards for this job.	1	2	3	4	5
3.	My work meets expectations of my manager.	1	2	3	4	5
4.	I strive for higher quality work than required.	1	2	3	4	5
5.	I expect to be promoted faster than average.	1	2	3	4	5
6.	I am far more knowledgeable than others who work in my area of expertise.	1	2	3	4	5
7.	I find real enjoyment in my job, and I am fairly well satisfied.	1	2	3	4	5
8.	I like my job better than the average worker.	1	2	3	4	5
9.	I intend to remain in my profession but to leave my current company at or before the end of this year.	1	2	3	4	5
10	I would consider taking another job.	1	2	3	4	5

### Part V. Demographics

Lastly, this section will ask you to provide your general information such as gender, age, tenure, and so on. Please respond to the following questions.

1. Gender:	$\Box$ Male $\Box$ Female					
2. Education completed:	<ul> <li>□ High school</li> <li>□ Associate degree</li> <li>□ Bachelor's degree</li> <li>□ Graduate degree</li> </ul>					
3. Years of servie at the company:	Year					
4. Current position:	<ul> <li>□ Staff</li> <li>□ Assistant manager</li> <li>□ Manager</li> </ul>					

- □ Senior Manager
- □ Director

## APPENDIX B

SURVEY QUESTIONNAIRE (Korean Version)

### 교육훈련과 인간관계에 관한 설문

<u>오하이오주립대학교에서 실시하는 본 설문에 관심을 가져 주신 여러분들께</u> <u>깊은 감사를 드립니다.</u> 본 설문조사의 목적은 교육훈련이 회사 내 사람들과의 상 호작용에 어떠한 영향을 미치는지를 보기 위한 것입니다.

본 설문에 소요되는 시간은 15-20분 정도 예상됩니다. 여러분의 모든 응답 은 비밀이 보장되며, 종합된 자료만 결과로 보고 될 것입니다. 응답하기 어렵거나, 응답하기 곤란한 질문은 생략하실 수 있습니다. <u>여러분의 참여는 자발적이며, 응</u> 답을 원하지 않는 질문은 답변하지 않으셔도 됩니다.

여러분의 참여는 매우 중요하며, 향후 교육훈련 분야에 많은 기여를 하게 될 것입니다. 본 설문은 2009년 11월 25일까지 작성해 주시면 대단히 감사하겠습니 다.

설문과 관련하여 질문이 있으실 경우, <u>로날드 제이콥스 교수</u> (Jacobs.3@osu.edu) 또는 황선옥(hwang.180@osu.edu)에게로 이메일 주시기 바랍니다.

본 설문에 참여해 주신 여러분께 다시 한 번 진심으로 감사드립니다.

로날드 제이콥스, 박사 오하이오 주립대학교 1-614-292-0589 Jacobs.3@osu.edu 황선옥, 박사과정 오하이오 주립대학교 1-614-805-9648 Hwang.180@osu.edu

#### Part I. 네트워크 형성에 있어서의 교육훈련의 효과성

다음은 여러분께서 <u>지난 1년 간 참여했던 교육훈련</u>에 관한 질문입니다. 아래 항목 중, 본인이 과거 참여한 경험이 있는 교육훈련에 대해서 답해주시기 바랍니다.

#### 참고. 어드바이스 네트워크 (Advice networks) 란,

업무 수행에 필요한 정보나, 조언, 안내 등을 공유하거나, 주고받는 관계를 의미합니다. 예를 들어, 연초에 수립된 예산안을 재조정하려고 하는데, 어떻 게 해야 하는지 잘 모를 경우, 여러분은 가까운 동료나 예산수립에 대해 잘 알고 있는 회사 내 누군가에게 조언을 구할 것입니다. 이때, 여러분이 조언 을 구한 그 사람과의 관계를 바로 어드바이스 네트워크라 부를 수 있습니다.

아래의 각 교육훈련이 얼마나 효과적으로 회사 내에서 어드바이스 네트워크를 구 축하는데 도움이 된다고 생각하십니까?

N/A = 해당사항 없음

	매우 비효과	·적			매우 효과	<u>'</u> 적
11.신입사원 대상의 공식적인 멘토링 프로그램	1	2	3	4	5	N/A
12.회사에서 공식적으로 실시하는 직장 내 교육훈련 (OJT)	1	2	3	4	5	N/A
13.상사나 감독자가 실시하는 비공식적인 직장 내 교 육훈련 (OJT)	1	2	3	4	5	N/A
14.액션러닝 (Action learning) 프로젝트	1	2	3	4	5	N/A
15.하이닉스 HRD 센터에서 실시하는 집합교육	1	2	3	4	5	N/A
16.하이닉스 HRD 센터 이외의 외부 교육기관에서 실 시하는 집합교육	1	2	3	4	5	N/A
17.새로 구입한 장비나 소프트웨어에 대한 벤더교육	1	2	3	4	5	N/A
18.각 사업부에서 실시하는 기술교육이나 세미나	1	2	3	4	5	N/A
19.휴식시간이나 점심시간에 동료들과 이야기하면서 업무와 관련된 문제의 해결책을 찾음	1	2	3	4	5	N/A
20.업무와 관련된 지식과 기술 함양을 목적으로 동료 들과 함께 결성한 학습공동체 (또는 스터디그룹)	1	2	3	4	5	N/A
21.하이닉스 지식관리시스템(KMS, Knowledge Management System) 이용	1	2	3	4	5	N/A

#### Part II. 어드바이스 네트워크에 대한 질문

지시문:

- 1. 지난 1 년 간 교육훈련을 통해 알게 된 사람으로, 업무에 필요한 정보나 조언이 필요할 때 도움을 요청하는 사람이 있다면, 그 사람들의 이니셜을 5명까지 아래 빈 칸에 적어주세요.
- 2. 다음, 이니셜을 적은 박스 우측의 각 질문에 대한 답을 적절히 선택해, 체크해 주세요. (예시를 참고바람.)

참고: 만약 이니셜이 동일한 사람이 2명 이상일 경우, 아래 예시와 같이 이니셜 다음에 숫자를 붙여주세요.

	A. 해당 인물의 이니셜	B. 해당 인물	C. 해당 인물의 직위			D. 해당 인물과의 연락 빈도					
		본인과 동일 부서 소속	타(他) 부서 소 속	본인보다 낮음	본인과 동일	본인보다 높음	1달에 4 회이상	1달에 3 회	1달에 2 회	1달에 1 회	1달에 1 회이하
에시	К		$\checkmark$		$\checkmark$				$\checkmark$		
에시	K2	$\checkmark$				$\checkmark$	$\checkmark$				
1											
2											
3											
4											
5											

### Part III. 성격 유형에 대한 질문

다음으로 성격 유형에 대한 질문입니다. 아래 각 문항에 대해서 자신을 평가해 주세요.

전혀 동의하지 않음 = 1, 동의하지 않음 = 2, 확실하지 않음 = 3, 동의함 = 4, 매우 동의함 = 5

11.나는 별로 긴장하지 <u>입</u>	<u>낳는</u> 다.	1	2	3	4	5
12.나는 기분이 울적한 적	력이 거의 <u>없다</u> .	1	2	3	4	5
13.나는 쉽게 스트레스를	받는다.	1	2	3	4	5
14.나는 걱정이 많다.		1	2	3	4	5
15.나는 쉽게 불안감을 느	-낀다.	1	2	3	4	5
16.나는 쉽게 화를 낸다.		1	2	3	4	5
17.나는 자주 기분을 전환	환한다.	1	2	3	4	5
18.나는 기분이 수시로 법	변한다.	1	2	3	4	5
19.나는 쉽게 신경질을 닌	변다.	1	2	3	4	5
20.나는 자주 우울해 진다	<b>}</b> .	1	2	3	4	5

## Part IV. 업무 성과에 대한 질문

이번에는 여러분의 업무 성과에 대한 질문입니다. 아래 문항을 읽고, 자신이 동의하는 수준을 선택해 주세요.

전혀 동의하지 않음 = 1, 동의하지 않음 = 2, 확실하지 않음 = 3, 동의함 = 4, 매우 동의함 = 5

11.나는 다른 사람들에 비해 매우 효율적으로 일한다.	1	2	3	4	5
12.나는 평균보다 높은 기준을 가지고 업무를 수행한다.	1	2	3	4	5
13.나는 항상 상사의 기대를 만족시킨다.	1	2	3	4	5
14.나는 항상 주어진 업무보다 높은 수준의 업무를 원 한다.	1	2	3	4	5
15.나는 평균보다 빨리 승진할 것으로 기대된다.	1	2	3	4	5
16.나는 다른 동료들에 비해 업무관련 지식 및 기술이 풍부하다.	1	2	3	4	5
17.나는 나의 일에 보람을 느끼며, 상당히 만족한다.	1	2	3	4	5
18.나는 다른 사람들에 비해 내 일을 좋아하는 편이다.	1	2	3	4	5
19.나는 올해가 가기 전에 다른 회사로 옮길 의향이 있 다.	1	2	3	4	5
20.나는 다른 직업으로 바꿀 의향이 있다.	1	2	3	4	5

### Part V. 일반정보

마지막으로, 여러분의 일반정보를 묻는 아래의 문항들에 답 해주세요.

5. 성별:	🗌 남자 🗌 여자
6. 교육수준:	<ul> <li>□ 고졸</li> <li>□ 전문대 졸</li> <li>□ 4년제대 졸</li> <li>□ 대학원 졸</li> </ul>
7. 하이닉스 입사 년도:	
8. 현재 직위:	<ul> <li>□ 사원</li> <li>□ 대리</li> <li>□ 과장</li> <li>□ 차장</li> <li>□ 부장</li> </ul>

## APPENDIX C

# INTERVIEW PROTOCOL (English Version)

### Interview for Training Approach and Advice Network

Dear Interviewees,

We are pleased to invite you to attend for this interview conducted by The Ohio State University. The purpose of this study is to determine whether different training approaches influence how employees interact with each other.

Your participation is important. We will use this interview to make sure that training approaches are designed and developed in the most appropriate and effective way.

It will take about 45-60 minutes to respond the questions. You will be asked to share your experiences, thoughts, and feelings about the process in which you developed your advice networks through training approaches in the past 12 months.

The information that you will share with us will be kept confidential, and we will not identify you in any way either verbally or in any report that is written based upon this interview. We will be audio taping this interview. The tapes will be transcribed for analysis. Your participation is voluntary, and you can refuse to answer any questions you do not want to.

This interview will start from November, 16, 2009. If you have any questions or concerns about completing the interview questions or about being in this study, <u>please</u> contact Ronald Jacobs at jacobs.3@osu.edu or Sun Ok Hwang at hwang.180@osu.edu.

Thank you very much for your time and cooperation.

Ronald L. Jacobs, Ph. D. The Ohio State University 1-614-292-0589 Jacobs.3@osu.edu Sun Ok Hwang The Ohio State University 1-614-805-9648 hwang.180@osu.edu

### Part I. Interviewee's Background Information

- What department do you work in?
- What is your current position?
- What is your highest degree?
- How long have you been working in the company?

#### Part II. Questions about Training Approaches and Advice Networks

I want you to think of an occasion when you attend a training program or participated in a learning activity. Think of an occasion when you got to know someone and built a new relationship with him/her through the process of the training or learning. Tell me the key elements of this experience with enough detail so that they can be clearly understood. I will be asking some questions to assist you in telling your story.

- 1. Do you have someone in particular during a training program that you continue to interact with until now?
- 2. What is the name of the training program?
- 3. Please describe the circumstances how and when you met this person?
- 4. When you contact this person now, do you interact with regarding work-related information or to seek advice? I mean, has this person helped you complete your work or perform better? In what way did he/she help you?
- 5. Have you ever met someone new during a training program, but you did not contact him/her after the training program was completed?
- 6. Why do you think the relationship with that person did not extend beyond the training program?

### Part III. Questions about the Development of Advice Networks

- 7. What factors seem to lead to encourage or discourage your ability to interact with others you have met during a training program?
- 8. What could the organization do to help people remain contacts with people they may have met during a training program?
- 9. If I wanted to help employees interact with each other more after a training program, what information would I need to know about the training program? The participants? The training methods used?

## APPENDIX D

## INTERVIEW PROTOCOL (Korean Version)

### 인터뷰 프로토콜

인터뷰 참여자분들께,

오하이오주립대학교에서 실시하는 본 인터뷰에 관심 가져주신 여러분께 깊은 감 사 드립니다. 본 인터뷰의 목적은 교육훈련이 회사 내 사람들과의 상호작용에 어떠 한 영향을 미치는지를 보기 위한 것입니다. 여러분의 참여는 매우 중요하며, 향후 보 다 나은 교육훈련 프로그램의 개발을 위한 중요한 자료가 될 것입니다.

본 인터뷰에 소요되는 시간은 약 45-60분으로 예상됩니다. 지난 1년 간 교육훈 련을 통해 여러분이 쌓은 어드바이스 네트워크 (advice network)에 대한 경험이나 의견, 느낌 등을 자유롭게 이야기해주시기 바랍니다.

모든 인터뷰 내용은 비밀이 보장되며, 여러분의 신분 또한 외부에 노출되지 않 을 것임을 보장합니다. 인터뷰 내용은 음성녹음이 됩니다. 인터뷰 도중 녹음을 원치 않으시거나 불편을 느끼실 경우, 언제라도 녹음기를 꺼달라고 요청하실 수 있으며, 추후 준비가 되신 후, 인터뷰를 재개할 수 있습니다. 응답을 원하지 않는 질문은 답 변하지 않으셔도 됩니다.

본 인터뷰는 2009년 11월 12일 실시될 예정입니다. 인터뷰나 본 연구와 관련하 여 질문이 있으실 경우, 황선옥(<u>hwang.180@osu.edu</u>)에게 이메일이나 전화주시기 바랍니다.

여러분의 참여에 다시 한번 깊은 감사드립니다.

로날드 제이콥스, 박사 오하이오주립대학교 1-614-292-0589 jacobs.3@osu.edu 황선옥, 박사과정 오하이오주립대학교 010-2950-7075 hwang.180@osu.edu

#### Part I. 인터뷰 참여자 배경정보

- 어느 부서에서 일하고 계십니까?
- 현재 직위는 무엇입니까?
- 최종학력은 어떻게 되십니까?
- 얼마나 오랫동안 하이닉스에서 일하셨습니까? (근무 년 수)

#### Part II. 교육훈련과 회사 내 직원 간의 상호작용에 관한 질문

앞에서 언급했듯이, 본 인터뷰의 목적은 왜, 그리고 어떻게 직원들이 교육훈련을 통해 인간관계를 넓혀가는지를 알아내는 것입니다. 특히, 본 인터뷰의 초점은 직원들 간의 조언관계, 또는 어드바이스 네트워크(Advice Network)에 있습니다. 따라서, 지 금부터 귀하는 교육훈련을 통해 어떻게 다른 사람들과 알게 되었고, 또한 이들과 조 언관계를 형성해 왔는지, 본인의 경험이나 생각, 의견, 느낌 등을 자유롭게 이야기 해 주시면 됩니다.

- 교육 중에 알게 된 회사 내 지인 중, 지금까지 연락을 주고받는 사람이 있습니까?
- 어떤 교육프로그램이었는지 기억하십니까? 그 교육프로그램에 대해 설명해 주십시오.
- 그 사람과 어떻게 알게 되었고, 어떤 동기로 계속 연락을 주고 받게 되었는지 그 상황을 좀더 자세히 설명해 주십시오.
- 그 사람과 업무와 관련된 정보나 조언을 종종 주고받습니까? 혹은, 그
   사람의 도움을 받아 업무를 쉽게 또는 잘 처리한 적이 있습니까? 어떤 식의 도움을 받으셨는지 구체적으로 설명해 주십시오.
- 고육에 참석해 알게 된 사람이지만, 해당 교육훈련이 끝난 후에는 서로 연락하지 않는 사람이 있습니까?

 교육이 끝난 후, 그 사람과는 연락하지 않았다면, 이유가 무엇이라고 생각하십니까?

#### Part III. 어드바이스 네트워크에 대한 질문

- 어떤 요인이 귀하로 하여금 교육프로그램을 통해 만난 사람들과 계속해서 연락을 주고 받게 만듭니까? 혹은, 그렇지 않게 만듭니까?
- 8. 교육을 통해 알게 된 지인과의 인간관계를 계속하게 유지하기 위해서, 회사
   는 어떠한 노력을 기울여야 한다고 생각하십니까?
- 교육이 끝난 후에도 교육생들이 서로 관계를 유지할 수 있도록 하기 위해서 교육프로그램은 어떤 노력을 기울여야 할까요? 교육생에 대한 더 많은 정보 를 공유해야 할까요? 또는 교육훈련 방식에 변화를 주어야 할까요? 귀하의 의견을 말씀해 주십시오.

## APPENDIX E

## STATISTICAL DATA FOR THE SCALED ITEMS

## **Perceived Effectiveness of NBTAs**

ITEM STATEMENT	Freq. %								
(n=182)	1	2	3	4	5	М			
1. A formal mentoring program for new employees	1	7	25	94	48	7			
	0.57	4	14.29	53.71	27.43				
2. A formal on-the-job training for workers	1	5	40	94	37	5			
	0.56	2.82	22.6	53.11	20.9				
3. An informal on-the-job training conducted by a designated experienced	1	6	35	77	59	4			
trainer or supervisor	0.56	3.37	19.66	43.26	33.15				
4. An action learning project with a group of colleagues		3	51	75	27	25			
	0.64	1.91	32.48	47.77	17.2				
5. A group-based training session in the Hynix HRD center		9	55	86	29	3			
	0	5.03	30.73	48.04	16.2				
6. A group-based training session provided by an outside training provider	1	10	44	84	32	11			
	0.58	5.85	25.73	49.12	18.71				
7. A group-based technical training provided by a business unit in Hynix to	0	8	47	62	44	21			
develop work-related skills	0	4.97	29.19	38.51	27.33				
8. An informal talk about how to solve a problem situation with peers during a	0	11	45	91	26	9			
break or lunch time	0	6.36	26.01	52.6	15.03				
9. A learning group formed by colleagues in your business unit to develop	3	8	37	91	40	3			
knowledge and skills required for my work	1.68	4.47	20.67	50.84	22.35				
10. A Hynix KMS (Knowledge Management System) for seeking information	0	7	28	77	59	11			
required to do my job	0	4.09	16.37	45.03	34.5				

Scale. 1=Very ineffective; 2=Ineffective; 3=Neither effective nor ineffective; 4=Effective; 5=Very effective; M=Missing value

## Advice networks

ITEM STATEMENT						Fre %	<u>q.</u>					
(n=182)	0		1		2	3		4		5		М
Network size	29		20		21	10	)	7		95		0
	15.93		10.99		11.54	5.4	.9	3.85		52.2		
Horizontal range	7		31	37		24		16		32		35
	4.76		21.09 25.17 16.33		10.88		21.77					
ITEM STATEMENT	Freq. %											
(n=182)	0	1	2	3	4	5	6	7	8	9	10	М
Vertical range	11	14	16	17	18	17	14	9	20	6	7	33
	7.38	9.4	10.74	11.41	12.08	11.41	9.4	6.04	13.42	4.03	4.7	
ITEM STATEMENT (n=146)	0.3-5		6-10	11-15		16-20		21-25		26-30		М
Frequency of Interaction	79		20		24	14	1	4		5		36
	54.1	1	13.70		16.44	9.59		2.74		3.42		

## **Emotional Instability**

	ITEM STATEMENT		Freq. %								
	(n=182)	1	2	3	4	5	М				
1.	I am relaxed most of the time.	10	55	40	69	8	0				
		5.49	30.22	21.98	37.91	4.4					
2.	I seldom feel blue.	15	75	39	48	5	0				
		8.24	41.21	21.43	26.37	2.75					
3.	I get stressed out easily.	9	52	58	59	3	1				
		4.97	28.73	32.04	32.6	1.66					
4.	I worry about things.	9	58	40	64	10	1				
		4.97	32.04	22.1	35.36	5.52					
5.	I am easily disturbed.	15	75	53	36	2	1				
		8.29	41.44	29.28	19.89	1.1					
6.	I get upset easily.	29	72	46	31	3	1				
		16.02	39.78	25.41	17.13	1.66					
7.	I change my mood a lot.	3	20	30	109	19	1				
		1.66	11.05	16.57	60.22	10.5					
8.	I have frequent mood swings.	20	87	49	23	1	2				
		11.11	48.33	27.22	12.78	0.56					
9.	I get irritated easily.	33	91	35	20	1	2				
		18.33	50.56	19.44	11.11	0.56					
10.	I often feel blue.	33	83	42	22	1	2				
		18.23	45.86	23.2	12.15	0.55					

Scale. 1=Strongly disagree; 2=Disagree; 3=Neither agree nor disagree; 4=Agree; 5=Strongly agree; M=Missing value

## **Perceived Job Outcomes**

ITEM STATEMENT	Freq. %					
(n=182)	1	2	3	4	5	М
1. My work efficiency is much higher than average	2	15	61	96	8	0
	1.1	8.24	33.52	52.75	4.4	
2. My standards of work quality are higher than the formal standards for this job.	1	7	46	110	17	1
	0.55	3.87	25.41	60.77	9.39	
3. My work meets expectations of my manager.	0	22	71	84	5	0
	0	12.09	39.01	46.15	2.75	
4. I strive for higher quality work than required.	0	10	58	100	13	1
	0	5.52	32.04	55.25	7.18	
5. I expect to be promoted faster than average.	1	38	113	29	1	0
	0.55	20.88	62.09	15.93	0.55	
6. I am far more knowledgeable than others who work in my area of expertise.	1	20	79	72	10	0
	0.55	10.99	43.41	39.56	5.49	
7. I find real enjoyment in my job, and I am fairly well satisfied.	3	28	60	85	6	0
	1.65	15.38	32.97	46.7	3.3	
8. I like my job better than the average worker.	0	28	54	85	15	0
	0	15.38	29.67	46.7	8.24	
9. I intend to remain in my profession but to leave my current company at or before the end of this year.	44	56	59	18	5	0
	24.18	30.77	32.42	9.89	2.75	
10. I would consider taking another job.	27	41	58	47	9	0
	14.84	22.53	31.87	25.82	4.95	

Scale. 1=Strongly disagree; 2=Disagree; 3=Neither agree nor disagree; 4=Agree; 5=Strongly agree; M=Missing value