Competencies for Port and Logistics Personnel:
An Application of Regional Human Resource Development

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Human resource development for regional strategic industries is an emerging emphasis for the development of industries that have growth potential. This article identifies competencies and expertise levels needed by port and logistics industry personnel, a sector that has growth potential in Busan, South Korea. The research consisted of expert interviews to develop a competency survey. Six competency clusters and 16 sub-competencies were developed. This research was useful in the development of an educational program and suggests ways in which regional human resource development (RHRD) can be used.

Keywords: Regional Human Resource Development, competencies, port and logistics industry, Korea

In the current competitive business world, knowledge and information technology are key factors in national and regional development. For many years now, Korea has been in the process of transforming itself from an economy that relies on material capital to one that relies on human capital, and from a physical labor base to a knowledge-based society. Under these circumstances, human resource development (HRD) based on knowledge and information is needed for the new industrial structure and economic development. It does so by developing employees' competencies (Park, 2002).

Several advanced countries, such as Finland, Ireland, and Singapore, as well as many developing countries, such as Kenya, Poland, and St. Lucia, are using National HRD

(NHRD) to adapt to this rapidly changing society (McLean, Osman-Gani, & Cho, 2004). At a national level, Korea, since 2000, has been conducting research projects and establishing and implementing NHRD policies. At a regional level, it is also applying regional HRD (RHRD) strategies to provide balanced regional development within the country (Lee, 2001). International organizations, such as the World Bank, OECD, and UNESCO, have suggested that RHRD is necessary to enhance regional development (Kang, 2002; Kim, 2003). Sustainable growth and development depend on the future and stability of its regional society, key factors being the quality and quantity of human resources available in the region.

McLagan (1997) stated that organizations are most concerned about their human competence base and its development. A competency approach has been used in business and industry through the influence of McClelland (1973), Boyatzis (1982), Spencer and Spencer (1993), and many others in the field for more than three decades. While competencies have been defined from several perspectives, one factor that is common in the literature is that the purpose of competencies is to improve human performance at work

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(Hoffman, 1999).

With the emergence of RHRD in Korea, Busan Metropolitan City recognized the importance of HRD for its development. Within Korea, one strategy for developing NHRD has been through regional efforts. Ahn and McLean (2006) investigated Busan City as a case study in establishing RHRD. Busan is located on the southeastern coast of the Korean peninsula. As the city started as a seaport in 1876, Busan has linked Korea to the world. With a population of 3.75 million inhabitants, Busan stands as the second economic center in Korea and is one of the regional poles in Northeast Asia. Busan has concentrated its growth strategy on one main asset—its port and associated logistics. This field has helped Busan achieve impressive performance, as it is ranked as one of the top five container ports and logistics centers in the world (OECD, 2004).

Busan currently emphasizes four major strategic industries--port and logistics, mechanical parts and materials, tourism and conventions, and IT, including film, an industry that uses technology applied to movies, cable TV, computer games, DVDs, and theme parks (Busan Metropolitan City, 2005). The port and logistics field is the most competitive and value-added but concerns exist for its long-term sustainability because of fierce international competition and the deficiency of competencies needed by its human resources (Hur, 2004). Although several universities and vocational institutions develop human resources in the port and logistics field, there are limits to the quality of the supply in a rapidly changing environment (Han, 2005). Despite the importance of RHRD in this industry in Busan, there has been little systematic research on the identification of competencies for port and logistics industry personnel.

Research Questions

The purpose of this research was to identify competencies and expertise levels needed by port and logistics industry personnel in Busan, Korea. The major research questions addressed were:

1. What competencies are most needed for port and logistics industry personnel?
2. What are the gaps between the desired and current expertise levels in the competencies of port and logistics industry personnel?

Literature Review

This literature review covers the areas of RHRD and competencies.

Regional Human Resource Development

As the importance of NHRD continues to grow, Korea is now placing emphasis on RHRD to sustain its competitive advantage (Kang, 2002; Kim, Yang, & Byun, 2001). National competitiveness can be developed through the synergy of regional competitiveness. HRD systems have generally contained three components: training and development, career development, and organization development, all of which aim at increasing organizational effectiveness and efficiency through performance improvement (Gilley & Eggland, 1989). Korean HRD professionals continue to struggle with a definition for HRD that fits the Korean context. The Korea Education Development Institute (2000) defined NHRD as the national effort to maximize social efficiency of its human resources and publicize the capabilities of its human resources. These goals can be achieved by enhancing social capital, such as morality and character, and developing core competencies required for a knowledge-based economy, leading to individual growth, efficient utilization of management systems, and competency of the whole nation. If this perspective of HRD is applied to regions, RHRD includes all efforts by regional agencies to acquire efficient development, utilization, inflow, and management of regional human resources to increase the quality of life in the region and regional competitiveness (Baek, 2002).

RHRD in Korea has been discussed using three models: 1) Labor economists mainly focus on solving the imbalance between supply and demand of personnel in the labor market. This model emphasizes employment policy for the region. However, this model is limited by its lack of attention to regional innovation and a lack of attention to lifelong learning (Lee, 2004). 2) Educators, in contrast, focus on lifelong learning, emphasizing the development of learning abilities at the regional level, but they tend not to include vocational skills development (Lee, 2004). 3) There is a balanced approach that combines industrial innovation at the regional level with an educational system that is innovative (Kim et al., 2001).

With the growing importance of NHRD, the HRD Working Group of the Asia-Pacific Economic Cooperation (APEC) have emphasized HRD at the regional level. This group defined RHRD as the "education and training issues that are cast very widely to include basic education, industrial training, productivity and equity in labour forces and workplaces, creation of comparable labour market data, lifelong and management development" (Zanko & Ngui, 2003, p. 13). Similarly, Korea is now emphasizing RHRD to sustain competitive advantage.

Kim (2002) analyzed the RHRD case of several overseas' countries, such as England, Finland, and Germany, and found that: 1) RHRD in England has developed a comprehensive approach for the development of regional economies and the use of regional society resources targeted at social solidarity through education, training, and employment; 2) RHRD in Finland has constructed a competency-based qualifying system to develop competent people for the needs of industry and create cooperative systems between businesses and universities; and 3) RHRD in Germany has promoted the economy and employment by creating policies based on the special needs of the region and concentrating on the systematic development of human resources in small and medium-sized companies. Through these case studies, Busan recognized the need to use RHRD to achieve regional economic development and social solidarity, conducting individual, organizational, and community learning.

Competency Studies

One of many definitions of competencies is "a descriptive tool that identifies the skills, knowledge, personal characteristics, and behaviors needed to effectively perform a role in the organization and help the business meet its strategic objectives" (Lucia & Lespinger, 1999, p. 5). Traditionally, Hayes (1980) defined competency as generic knowledge, motives, traits, self-image, and skills related to superior performance on the job. Pinto and Walker (1978) stated that competencies are the specific skills, knowledge, abilities, and other attributes, such as values and attitudes, necessary for the effective performance of activities. The European Union currently uses a composite definition to include cognitive, functional, personal, and ethical competence (Commission of the European Communities,

2005). Through the literature from France, the United Kingdom, Germany, and the United States, competence includes:

> "1) cognitive competence involving the use of theory and concepts, as well as informal tacit knowledge gained experientially, 2) functional competence, skills or know-how, those things that a person should be able to do when they are functioning in a given area of work, learning or social activity, 3) personal competence involving knowing how to conduct oneself in a specific situation, and 4) ethical competence involving the possession of certain personal and professional values." (p. 11)

After reviewing several definitions of competency, the authors defined competency as the mixture of knowledge, skill, ability, and characteristics associated with high performance in the workplace.

There are many authors who have asserted that developing employees' competency levels is very important for improving organizational productivity. Campbell (1990) focused on an individual's performance, and Swanson (1990) emphasized four factors of performance (work environment, aptitude, expertise, and motivation) at two levels (individual and organizational). In order to develop workers' competency levels, organizations have to provide training and selection systems that ensure that the know-how needed for work performance will be present.

In a knowledge-based society, increased industry competition has forced organizations to look into means by which they can further increase their competitive edge. Competitive advantage may be lost due to unanticipated technological or social changes taking place in the market (Bogner & Thomas, 1994; Collis, 1994; Reed & DeFillippi, 1990). Under these circumstances, Hamel (1994) and Helleloid and Simonin (1994) stated that core competencies are needed for organizations to have the potential for continuous upgrading and development. Hafeez, Zhang, and Malak (2002) asserted that core competencies are the source of sustainable competitive advantage.

Several HRD-related competency studies have been undertaken. The American Society for Training and Development's (ASTD) Workplace Learning and Performance model revealed trends and issues in the human resources field and also identified HRD competencies in the

United States (Rothwell, Sanders, & Soper, 1999). The International Board of Standards for Training, Performance, and Instruction (IBSTPI) reported instructional design, instructor, and HRD manager competencies (Gilley & Eggland, 1989). Several comprehensive lists (e.g., McLean & Sullivan, 1990; Worley, Rothwell, & Sullivan, 2005) of organization development competencies have been developed through literature reviews, personal experiences, surveys, and focus groups. Many HRD competency studies have been conducted to identify desired competencies of HRD personnel, contributing to selection, training and development, and performance management (McClelland, 1973; Russ-Eft, 1995; Spencer, 1997; Spencer & Spencer, 1993). If properly designed, a competency approach can enhance staffing and selection; education and training; organization development; and performance, promotion, and reward processes to meet both individual and organizational needs (Gangani, McLean, & Braden, 2006; Ozcelik & Ferman, 2006).

Cross-functional and competency-based human resources rather than one-function human resources are needed in Busan to develop the competitiveness of the port and logistics industry because universities' and vocational institutions' curricula do not meet industry's needs (Kang, 2005; Song, 2003). More broadly, while research on HRD and competency are growing, there is still little research on industrial competencies within HRD. No research was identified on competencies and expertise levels needed by port and logistics industry personnel. Thus, this research's main contribution is to identify competencies and expertise levels needed by port and logistics industry personnel in Busan, Korea, as an illustration of the application of RHRD.

Methods

This section describes the two methods used for data collection in this research to establish the competencies—interviews and survey, as well as the analysis of the results.

Expert Interviews

This study used expert interviews to extract competencies in the port and logistics industry with questions developed through a literature review. In particular, the study utilized the competency identification methods developed by Briscoe and Hall (1999), composed of research-based, values-based, and strategy-based methods.

Table 1

Competency Identification Methods

	Research-Based	Strategy-Based	Values-Based
Description	Behavioral approach focused on high performers	Forecasts competencies based on strategy, anticipated future	Competencies based on organizational norms and culture
Process	- Compare high performers and average or low performers - Focus group, interview, generic competency models	- Interview CEO as to future scenario and competencies required - Internal panel, scenario planning, expert panel	- Interview top executives or HR department - Interpretation of company's values - Examine documents
Advantages	- Based on actual legitimacy - Involve executives through interviews	- Competencies based on the future, not the past - Target executives - Support organization change	- Competencies are strong motivating power - Values are stable and have a long term perspective
Disadvantages	- Based on the past, not the future - May overlook intangible or unmeasurable - Requires extensive financial resources	- Anticipated future can be wrong/inaccurate - Based on speculation, not actual behaviors	- Values held may be the wrong ones - Difficult to translate into actual behaviors and to develop

Table 2
Competencies Identified

No.	Competency Clusters	Sub-competencies	Concept
1	Policy	Planning and management ability	Ability to manage planning and development for future port and logistics works
		Policy development and evaluation ability	Ability to create and evaluate new policy with the understanding of domestic & overseas port and logistics policy
2	System Management	Port and logistics hinterland development ability	Ability to develop useful port and logistics hinterland in order to optimize the added-value of port and logistics related industry
		Cargo work, transfer, following procedures system ability	Ability to improve port and logistics management through the systemization of port and logistics cargo work, transfer, and keeping procedure
		Customs procedures system ability	Ability to systemize the related procedures for the speedy customs clearance of ship and goods
		Quality management ability for port and logistics transit system	Ability to manage port and logistics connection transit system continuously
3	Service	Service model creating ability	Ability to create new business models and provide total services with port and logistics facility, technology, manpower, information and finance
		Ship company & cargo owner management ability	Ability to provide the follow up service and manages the business effectively for ship company & cargo owner
		Service quality improvement ability	Ability to understand and improve the quality of service of port and logistics business continuously
4	Product Development and Promotion	Distribution optimization & marketing ability	Ability to optimize the distribution structure through analysis of port and logistics market trends
		Cargo inducement ability	Ability to induce cargo from overseas shipping companies and cargo owners through strengthening port and logistics advisements and marketing functions
		Product development ability	Ability to produce new port and logistics products through the survey of future demands and business chances
5	Information	Port and logistics IT understanding and using ability	Ability to understand and use port and logistics information technology effectively
		IT network & operating ability	Ability to construct and operate IT networks for the total management of port and logistics information
6	Globalization	Analysis ability for global logistics	Ability to make decisions for the global logistics through the analysis of global economy and society
		Information prediction and using ability	Ability to predict changing trends of overseas port and logistics and utilize its information for the improvement of domestic port and logistics

The study primarily utilized the strategy-based method that focuses on competencies needed in the near future. The advantage of this method lies in the rapid identification of competencies through expert interviews, especially those at senior levels in the industry. In addition, diverse ideas were sought from both theoretical and practitioner experts, providing triangulation, ensuring a trustworthy research outcome. Table 1 describes the methods in more detail.

In this study, seven experts, including two professors, two HRD personnel, and three CEO practitioners from the port and logistics industry, were selected to be interviewed on the basis of the roster of consultative committee members for the port and logistics industry of Busan Metropolitan City. Prior to the interviews, semi-structured interview questions were developed. In the first interview session, the interviewee discussed the current industrial status and problems, vision, and needed competencies. In the second interview session, the interviewee reviewed the competency outcomes of the first interviews and confirmed them, added to them, deleted them, or changed them. An on-site visit was made to the port and logistics industry to validate the trustworthiness of the interview outcomes. Finally, each interviewee organized the competencies into clusters, identifying both the clusters and sub-competencies, defining each.

The interviews were transcribed verbatim, and competency patterns were identified. The data were then classified into clusters and sub-clusters in terms of similarity and difference. As these results drove the development of the survey, described in the next section, the results of the interviews are shown in Table 2.

Survey

To ensure face validity of the competencies identified from the two consecutive interview sessions, these competencies were used to create a survey. The survey was distributed to a random sample of 152 companies' practitioners in the port and logistics industry based on a research paper listing 1,699 maritime and port and logistics companies in the Busan area (Busan Metropolitan City, 2000). The researchers focused on larger companies having more than 40 employees because the larger companies had more influence in the port and logistics industry. As a result,

152 companies were selected at random from transport, cargo work, wrapping, and cargo and transport service companies. Of the 152 companies that received the survey, 145 responses (95.4%) were received after personal visits to the 152 companies to collect data first-hand, with one additional follow-up visit when necessary. The survey contained 16 questions about the desired and current expertise levels for each competency listed, using five values ranging from "very high" to "very low." The reliability obtained for the total competency lists in the desired and current expertise levels was quite high, both showing Cronbach's alphas of .94.

Data Analyses

The data from the survey were analyzed using descriptive statistics, including means and standard deviations, and paired t-tests to determine if differences existed between desired and current expertise levels. A p-level of .05 was used.

Results

All of the t-tests conducted for this research were significant at the $p < .001$ level. Differences between the desired and current expertise levels for competency clusters are shown in Table 3, while similar differences between sub-competencies are shown in Table 4. In every case, the desired competency level was greater than the current level.

The Busan port and logistics industry personnel perceived the information competency cluster (4.08) as the highest level of required expertise, the only one above 4.0. The highest current expertise level is also the information competency cluster (3.10), though it is considerably lower than the required level. For the sub-competencies, the highest level of required expertise was IT understanding and using ability (4.15), followed by IT network and operating ability (4.00), the only two sub-competencies to be at 4.0 or greater. The highest current expertise level was IT network and operating ability (3.13); again, all of the current sub-competency levels are considerably lower than the required levels.

Table 3

T-test Results between Desired and Current Expertise Levels for Competency Clusters

Competency Cluster	Mean (Standard Deviation)		Difference (Desired - Current)	p
	Desired	Current		
Policy	3.65 (.71)	2.80 (.77)	.84	.000***
System Management	3.80 (.78)	2.93 (.85)	.88	.000***
Service	3.82 (.78)	2.94 (.85)	.89	.000***
Product Development and Promotion	3.75 (.76)	2.81 (.81)	.94	.000***
Information	4.08 (1.43)	3.10 (.81)	.97	.000***
Globalization	3.75 (.83)	2.84 (.89)	.91	.000***

*** $p<.001$.

Table 4

T-test Results between Desired and Current Expertise Levels for Sub-competencies

Competency Cluster	Sub-competencies	Mean (Standard Deviation)		Difference (Desired -Current)	p
		Desired	Current		
Policy	Planning and management ability	3.76 (.78)	2.90 (.79)	.85	.000***
	Policy development and evaluation ability	3.64 (.81)	2.80 (.91)	.84	.000***
	Port and logistics hinterland development ability	3.52 (.93)	2.69 (1.00)	.83	.000***
System Management	Cargo work, transfer, keeping procedure system ability	3.82 (.93)	2.93 (1.02)	.89	.000***
	Customs procedure system ability	3.88 (.87)	3.01 (.99)	.87	.000***
	Quality management ability for port and logistics transit system	3.77 (.94)	2.88 (.95)	.88	.000***
Service	Service model creating ability	3.69 (.96)	2.78 (.99)	.90	.000***
	Ship company and cargo owner management ability	3.91 (.88)	3.01 (.98)	.89	.000***
	Service quality improvement ability	3.88 (.89)	3.02 (.99)	.86	.000***
Product Development & Promotion	Distribution optimization and marketing ability	3.71 (.81)	2.80 (.88)	.91	.000***
	Cargo inducement ability	3.87 (.90)	2.92 (1.00)	.94	.000***
	Product development ability	3.69 (.90)	2.72 (1.02)	.97	.000***
Information	Port and logistics IT understanding and using ability	4.15 (1.55)	3.07 (.89)	1.08.	.000***
	IT network & operating ability	4.00 (.85)	3.13 (.93)	.87	.000***
Globalization	Analysis ability for global logistics	3.76 (.93)	2.83 (.98)	.94	.000***
	Information prediction and using ability	3.74 (.87)	2.85 (.99)	.89	.000***

*** $p<.001$

Recommendations for Practice and Policy Development

First, human resource development in a knowledge and information based society is needed for this new industrial structure and for economic development and can best be realized by developing employees' competencies. The competency most required and where there is the greatest gap between current and required competency in the port and logistics industry in Busan, Korea, is information, followed by services, system management, product development and promotion, globalization, and policy, in order. Practitioners are concerned about the development of the regional port and logistics industry and improving the competitiveness of the global port and logistics industry. This will require greater port and logistic IT understanding and using ability and IT network so that information technology will have more influence on the port and logistics industry.

Second, the competitive advantage of the industry may be lost due to unanticipated technological or social changes taking place in the market. The competencies and sub-competencies should be used by the port and logistics industry for selection, staffing, training, performance management, and promotion because competencies are needed for organizations to have the potential for continuous upgrading and development.

Third, the port and logistics industry is the most competitive and value–added industry in Busan, but concerns exist for its long-term sustainability because of fierce international competition and the competencies needed by its human resources. A competency-based cooperative education program should be established between the industry and universities and vocational schools, based on this competency study.

Fourth, Busan ranks among the top five container ports in the world, achieving this ranking in 2007. The quality of peripheral linkages with rail, road, and air freight beyond the port is improving for port competitiveness. As the policy competency cluster includes policy development, evaluation ability, and port and logistics hinterland development ability, policy competency has to develop for practitioners in the port and logistics industries in Busan.

Recommendations for Future Research

Such competency studies should be conducted regularly so that the curricula from universities and vocational institutes do not become outdated again. Such education programs should not focus only on initial preparation, but also need to focus on continuous learning for those employed in the industry. Updating competency studies will also be useful for the industry in conducting their continuous training and development.

Competency studies should be done for other leading industries in the Busan area, such as tourism and conventions, mechanical parts and materials, and film and information technology. Busan is currently emphasizing these four major strategic industries' competencies. The Busan Metropolitan City government can play a role in providing funding and personnel for such studies, as well as continuing to encourage industry involvement to generate the same kind of outstanding response rate as garnered in this study.

Several competencies, such as system management, services, product development and promotion, and globalization, need to be benchmarked because Busan is currently competing with the other top five container ports. Future research might explore performance differences with practitioners in the port and logistics industry in foreign port cities.

The organization has to provide a training and selection system that ensures the know-how needed for work performance in order to develop employees' competencies. Research to explore the effectiveness of competency-based education, rather than job-based educational programs, would make an excellent contribution to HRD literature and knowledge.

This research used the strategic-based method by Brisco and Hall (1999) to identify competencies. As a result, information competency clusters and its sub-competencies emerged as the most important. Further competency research could use high performance analysis or an organizational norms and culture-based approach.

Future research could explore competencies based on organizational characteristics in the port and logistics industry, such as organizational culture, organization size, and structure.

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