

Meet Demands of the Logistics Industry

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The development of human resources (i.e., executives and staff workers alike) in the logistics industry is a crucial factor that contributes toward increasing the nation's competitive industrial capacity. According to a study by the National Economic and Social Development Board (NESDB),¹ it is estimated that between 2005 and 2009 demand for labor in logistics will increase annually by 22,000 on average. Based on "value chain/web analysis," the current knowledge and skills of labor/staff falls well below the expectations of employers in the logistics field, especially of those working in "supply chain management," a group that has a major impact on the logistics industry.

There are currently seven universities offering courses directly related to logistics and four institutes offering short training/seminar sessions. Combined, these educational institutions produce about 2,000 staff a year for the logistics industry. Although there has been an increase in the number of logistics-related curricula, there are still certain limitations on human resource/staff development. Specifically, they are (1) lack of educational institutions that focus directly on producing logistics staff, particularly those related to operational techniques, (2) shortage of good quality labor, specifically with regard to critical knowledge/skills and communications technology, and (3) lack of professionals and funding for research and development to ensure sustainability.

From evaluating the demands for labor both in quantity and quality as well as taking into consideration the needs and limitations of various educational institutions that develop staff for the logistics workforce, a strategy for developing qualitative human resources that meets the demands of the logistics industry can be outlined. This strategy comprises three main objectives: (1) developing a knowledge base, (2) developing skills/expertise, and (3) developing institutions and professionals. These goals

can be reached through the implementation of short-term and long-term approaches, as will be highlighted in the concluding section of this article.

1. SIGNIFICANCE OF HUMAN RESOURCES IN THE LOGISTICS INDUSTRY

Logistics² plays a critical role in the advancement of national trade and contributes toward economic progress. It also increases the competitive capacity of industries, which increases the nation's industrial competitiveness. Human resources are a crucial factor in ensuring the efficiency and effectiveness of logistics.

Nevertheless, in the past, Thailand has encountered key problems pertaining to labor involved in logistics, that is, a shortage of staff with knowledge, expertise and know-how directly related to the logistics field. This is mainly because there are only a few educational institutions that offer courses on logistics, and none that offer courses at the vocational level. In addition, logistics workers in general have problems with the English language and oral/written communication skills compared with rival neighboring countries. There is also a shortage of staff that are knowledgeable and experienced in communications technology.

From this set of problems, it is necessary to continue developing the quality of workers in order to respond to the demands of the industrial sector (especially in supply chain management, whose role is to plan and administer strategies throughout the entire system). Therefore, this study is an evaluation of logistics labor that pass through educational institutions and short training courses held by various organizations in 2005. The assessment is based on the compilation of documents and interviews with key informants in the logistics industry.

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The research team would like to thank Mr. Vee Chansa-Ngavej for the preparation of the English-language version of this paper.

2. QUANTITY OF LABOR DEMAND IN THE LOGISTICS SYSTEM

In 2005, vehicle drivers comprised the largest group of logistics labor, with 110,356 workers. This was followed by administrative and service staff, who made up the second largest group with 68,911 workers; next were manual laborers at 32,575 workers, and executives at 26,896. All other groups combined equaled 65,245 (Figure 1).

Demand for labor in coming years was predicted under the assumption that annual growth for logistics will be about 6.0-6.76 percent. Using this figure, it is estimated that the demand for logistics labor will increase on average by 22,000 people per year for the next four years.

3. QUANTITY OF LABOR DEMAND IN THE LOGISTICS INDUSTRY

3.1 Current Situation of Human Resources in the Logistics Industry

Although there is a tendency that labor supply will increase to meet the growing demands of the domestic and international markets, the fundamental problem lies in qualitative rather than quantitative labor shortages. While educational institutions have been offering relevant degree

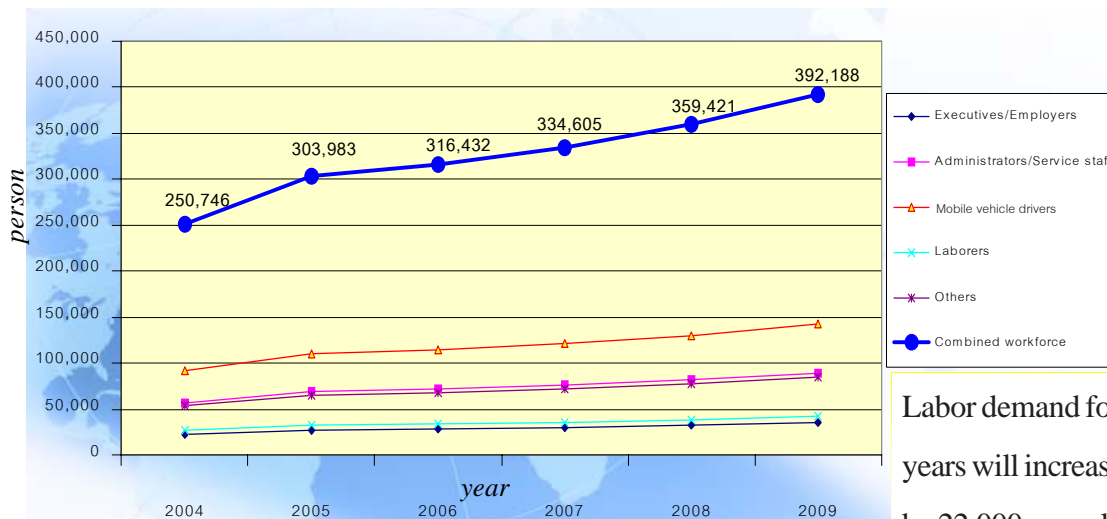
courses as well as short training courses, it is still insufficient to meet market expectations. Moreover, as yet no courses are aimed at producing staff at the vocational level.

Experts and executives in the logistics industry agree that knowledge and technical expertise play an integral role in increasing the nation's competitive capacity. These skills include (1) knowledge and expertise in communications technology, and (2) English-language communication skills as well as knowledge of a third language such as Chinese or Japanese. The Thai labor market still lags behind regarding these skills.

Furthermore, most workers involved in logistics, particularly those at the lower levels that comprise the largest group of laborers, still possess insufficient knowledge about the general framework of the logistics industry and supply chain management systems, which leads to ineffective operational and management procedures.

In addition, skilled public sector administrators who implement specific logistics-related policies still lack a thorough understanding of the commercial significance of logistics and the management of the supply chain system. This causes inefficiencies such as delays at customs and, in certain cases, the public sector making inappropriate decisions owing to a lack of standardized decision-making guidelines.

Figure 1 Estimated Labor Demand for Logistics, 2005-2009



Source: TDRI (2004) Study on strategic planning for expanding human resource capacity to increase industrial competitiveness.

Labor demand for the next four years will increase on average by 22,000 annually.

Estimates calculated using data surveying average work rate of population every one and three years from 1994 to 2003, as follows:

$$\ln THT_t = -39.889 + 0.016 \text{ time} + 0.516 \ln YT_t - 0.133 DT$$

THT_t = Accumulated weekly hours of logistics workers

YT_t = Actual output of transportation and telecommunications

DT = 1 in the year 2000

Annual growth rate for logistics industry estimated at 6.0-6.7 percent.

3.2 Evaluation of Critical Knowledge/Skills Level for Staff Based on the Value Chain of Logistics Model

The evaluation of labor demand based on the value chain model (Figure 2) highlights the importance of qualitative labor analysis by dividing expertise into critical knowledge and critical skills. This model helps to evaluate the necessary skills required for each logistics position, through revision of international case studies as well as brainstorming sessions by key informants.³

The evaluation of expectations for critical knowledge/skills and actual knowledge/skills for each position in the value chain is depicted through the web analysis method. This is the **median** of both the workers' expected and actual critical knowledge/skills from a scale of 5 (highest level of expertise) to 0 (no expertise).

The criteria for evaluating critical knowledge and skills sets of each occupational position on the value chain is assessed using the Table 1.

Figure 2 Value Chain of Logistics

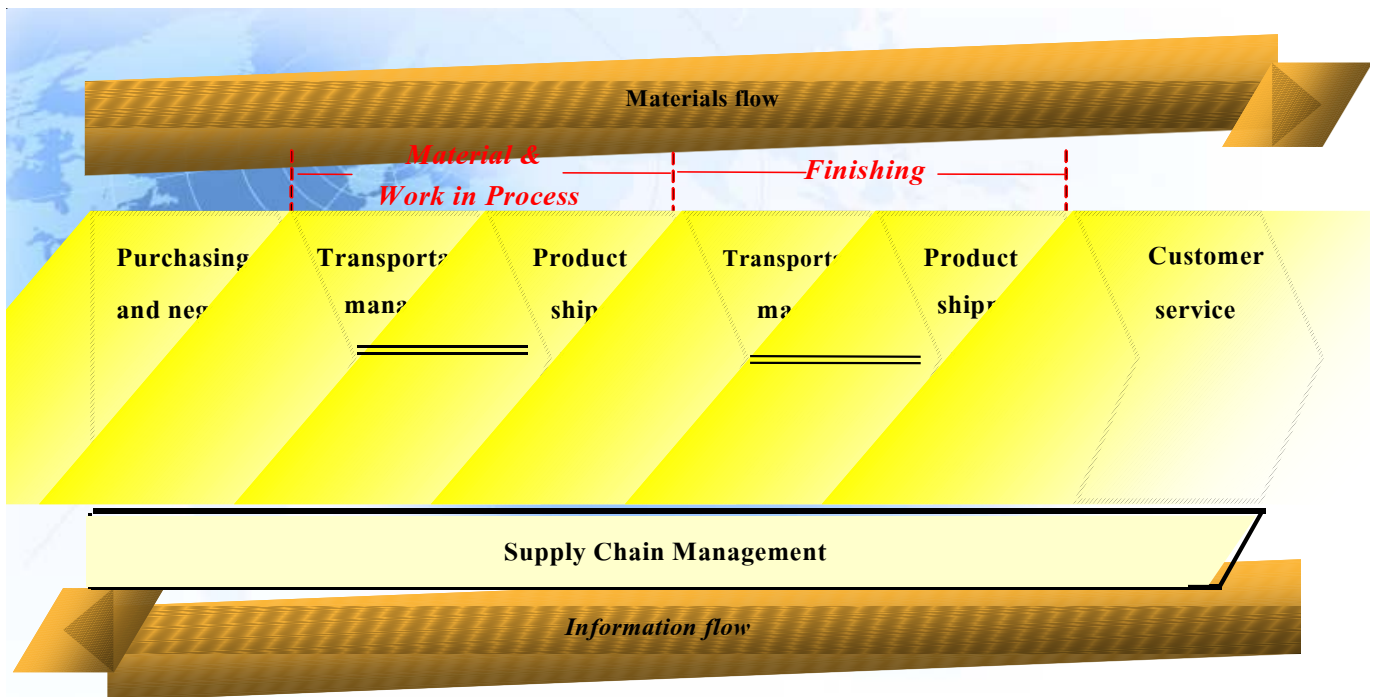


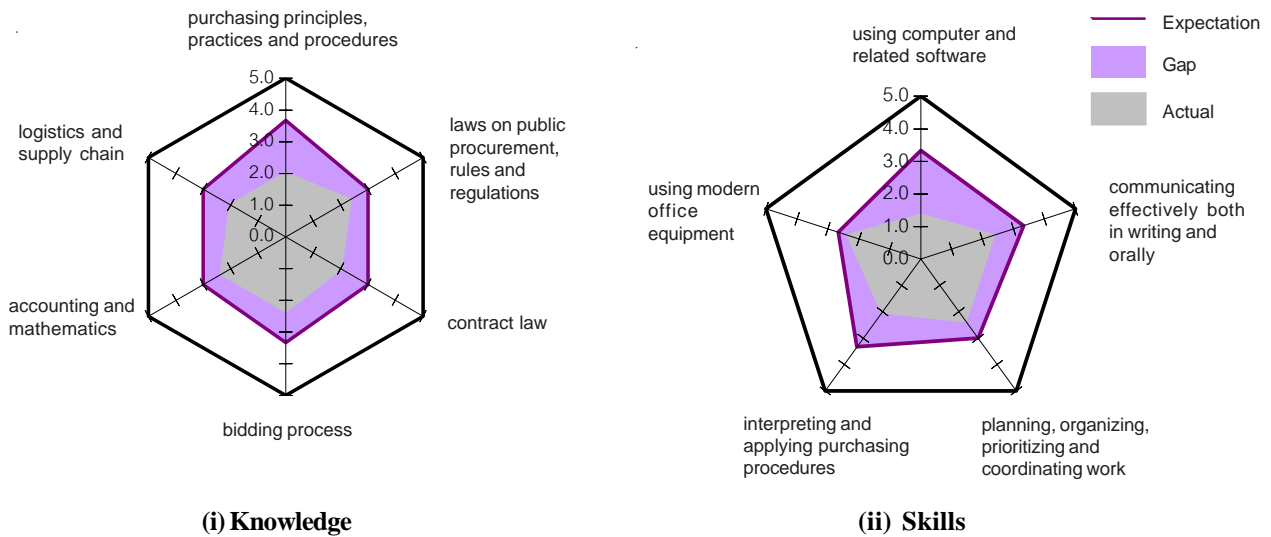
Table 1 Criteria for Knowledge/Skills Evaluation

CRITICAL KNOWLEDGE SET		CRITICAL SKILLS SET	
Level 1	Basic knowledge in each job aspect	Level 1	Able to solve day-to-day problems and carry out operations according to manuals/instructions
Level 2	Extensive knowledge in each job aspect	Level 2	Able to implement plans and solve complex problems both individually and as part of a team
Level 3	Extensive knowledge plus ability to link knowledge bases, broad understanding of strategic operations at the organizational level	Level 3	Able to teach and transfer specific skills to others
Level 4	Extensive and in-depth knowledge to meet standardized industry levels	Level 4	Able to improve and increase efficiency of operational procedures without advice from others
Level 5	Expert extensive and in-depth knowledge, ability to create internationally recognized innovations	Level 5	Able to act as advisor to others in improving effectiveness of operational procedures

This method of qualitative evaluation aims to determine the gap between the industry’s expectations and

the actual worker’s expertise. The web analysis results for each staff group are as follows:

1. Purchasing Officers



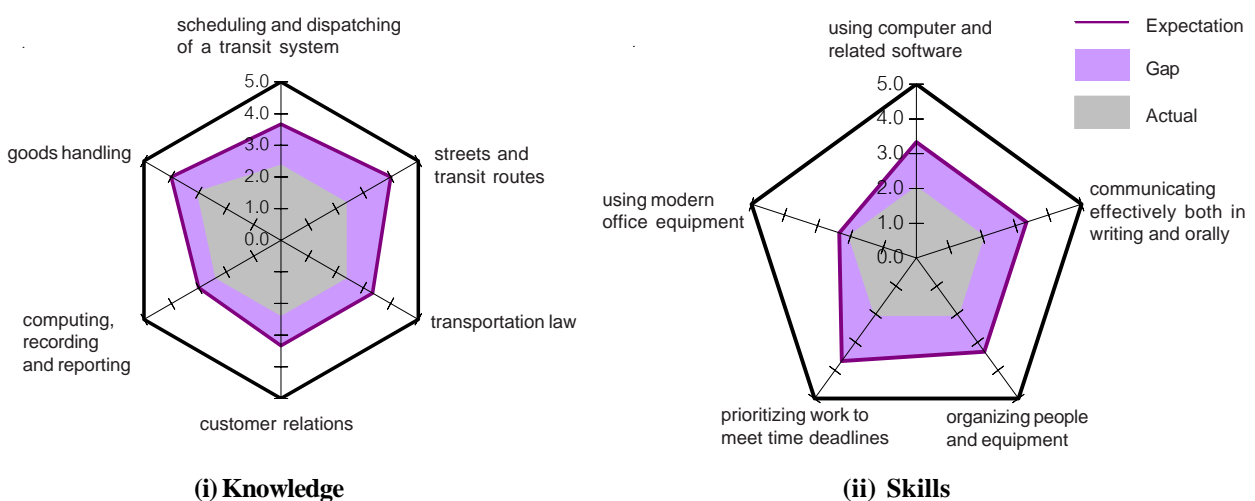
Source: Survey data.

For this position, critical knowledge of purchasing principles, practices and procedures fall well below the expectations of the industry’s qualitative demands, while lack of computer software expertise as well as inability to operate e-commerce programs, which have become integral in today’s logistics business, tops the critical skills agenda.

2. Transportation Officers

This category comprises four positions: (1) dispatcher and transportation scheduler, (2) transportation vehicle driver, (3) crane operator and (4) freight forwarder.

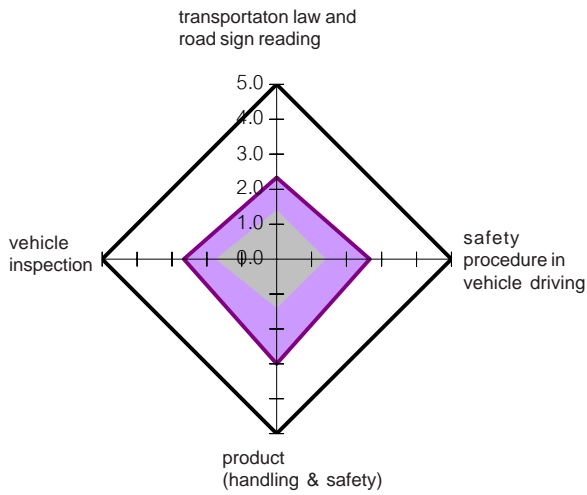
- Dispatcher and Transportation Scheduler



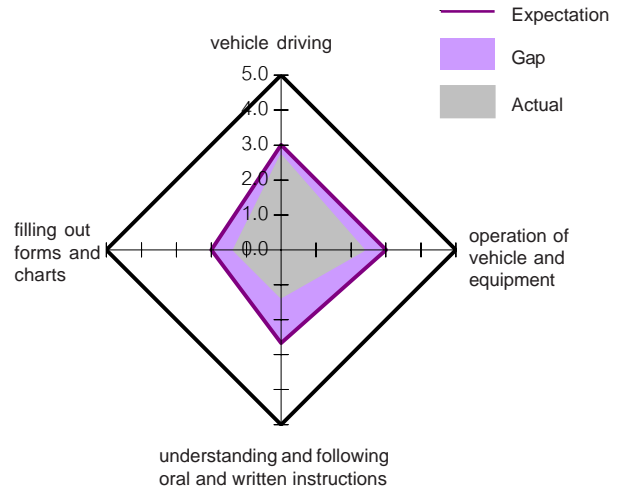
Source: Survey data.

Critical knowledge of scheduling and dispatching transit route choices falls well below the expectations, while key skills that need to be propped up include effective oral and written communication and prioritizing work to meet deadlines.

- *Transportation Vehicle Driver*



(i) Knowledge

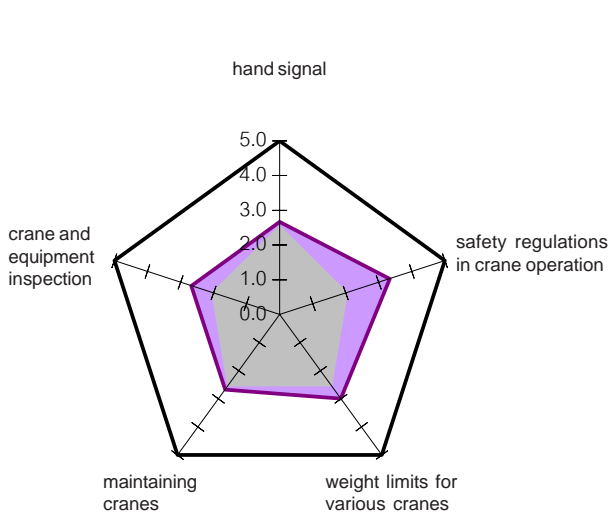


(ii) Skills

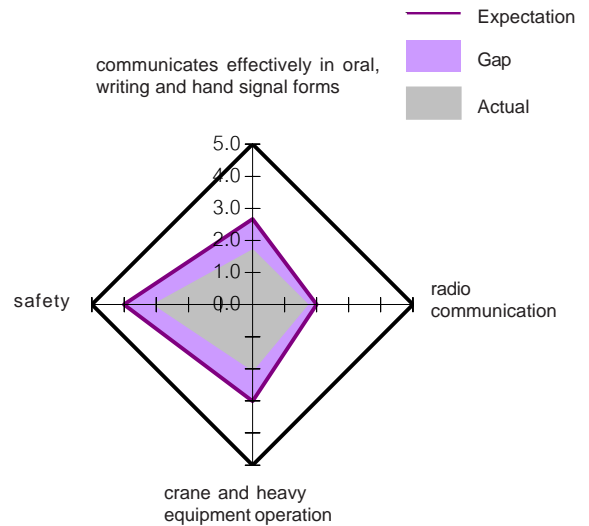
Source: Survey data.

Industry demands indicate that safety procedures (both in vehicle driving and handling of products) are higher than the current actual knowledge possessed by vehicle drivers. Employers also expect vehicle drivers to have better understanding of oral and written instructions as well as carrying the orders out with precision.

- *Crane Operator*



(i) Knowledge

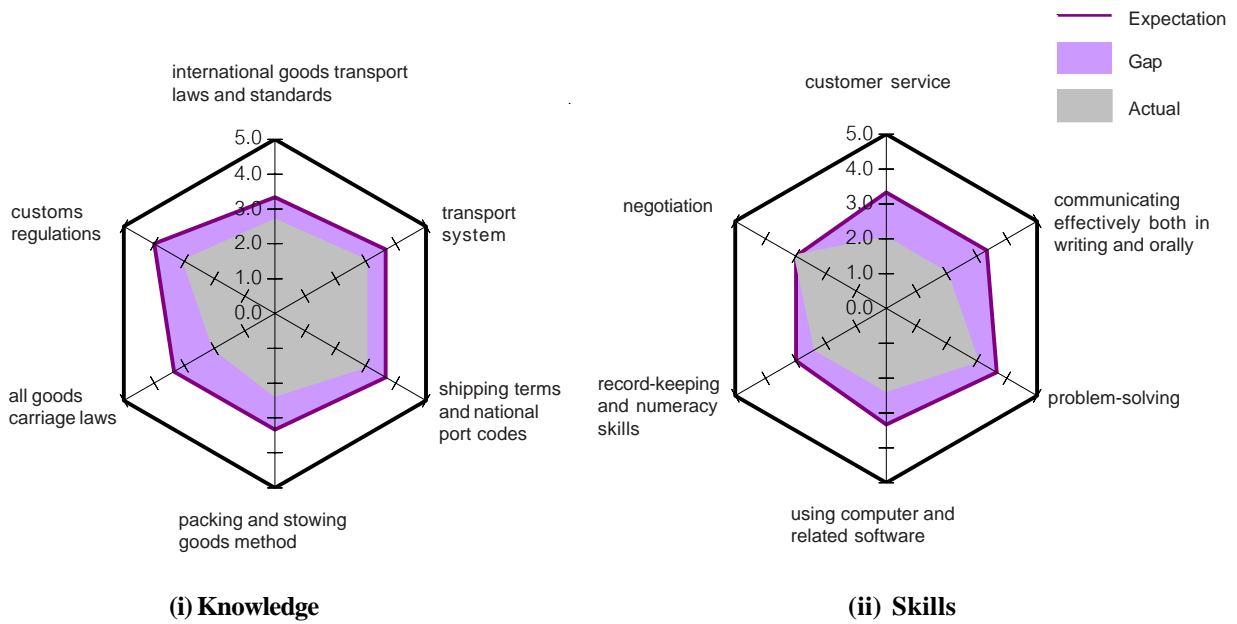


(ii) Skills

Source: Survey data.

Once again, better knowledge of safety regulations is the most demanded qualitative aspect that employers expect. Nevertheless, it is important to note that most other critical knowledge aspects do satisfy the demands of employers. As for critical skills, safety issues, on which employers place highest priority and expectations, again tops the list of concerns.

- Freight Forwarder

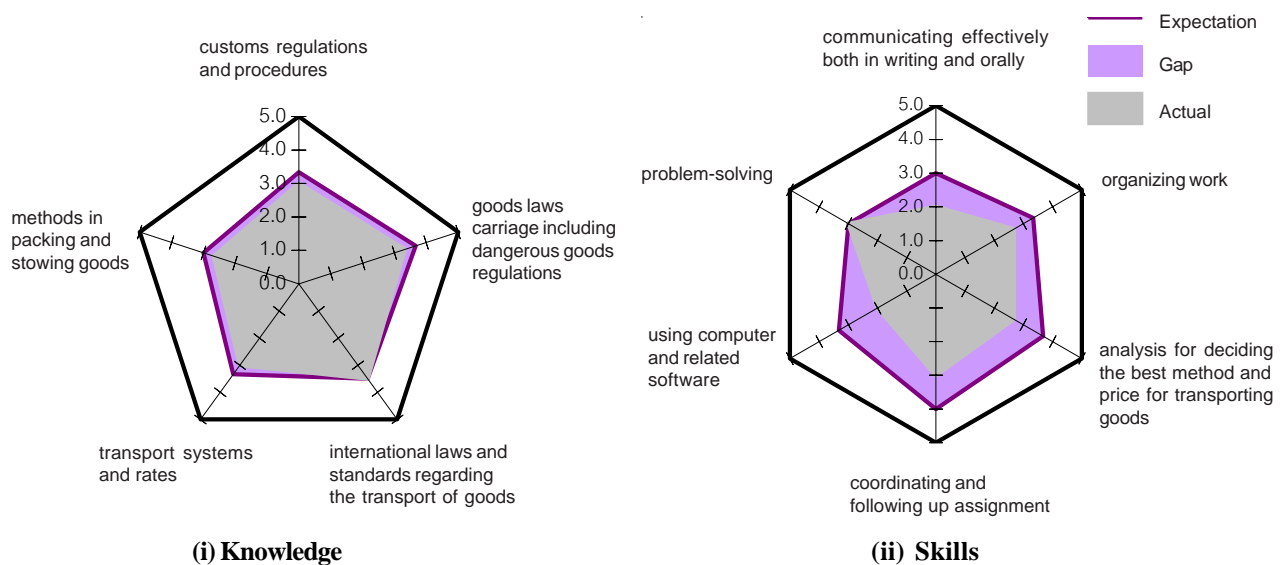


Source: Survey data.

Employers have high expectations for freight forwarders in many critical knowledge aspects and critical skills, from knowledge of international transport and customs laws to record-keeping and problem-solving skills. While negotiations skills satisfactorily meet the qualitative demands of employers, there is still much room for improvement in knowledge of all goods carriage laws as well as customer service and written/oral communication skills.

3. Export Officers

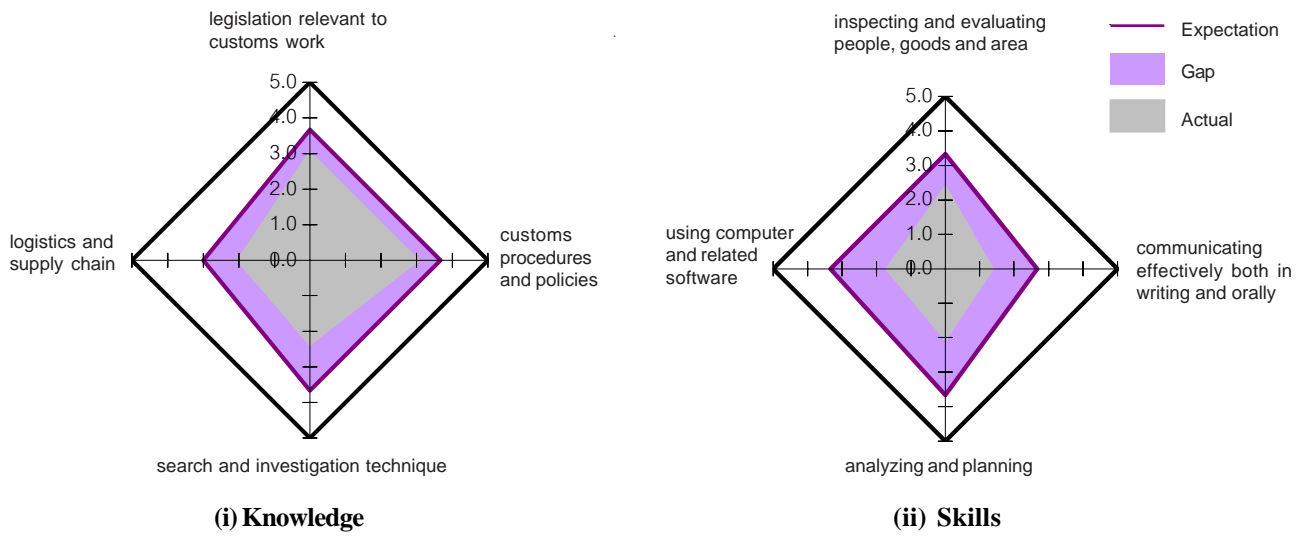
- Shipping Agent



Source: Survey data.

Most employers feel that the actual levels of the employee’s knowledge satisfactorily meet most critical knowledge aspects required for this position. However, there could be increased training for computer skills in order to operate related software and thus raise the efficiency of shipping operations.

- Customs Officers

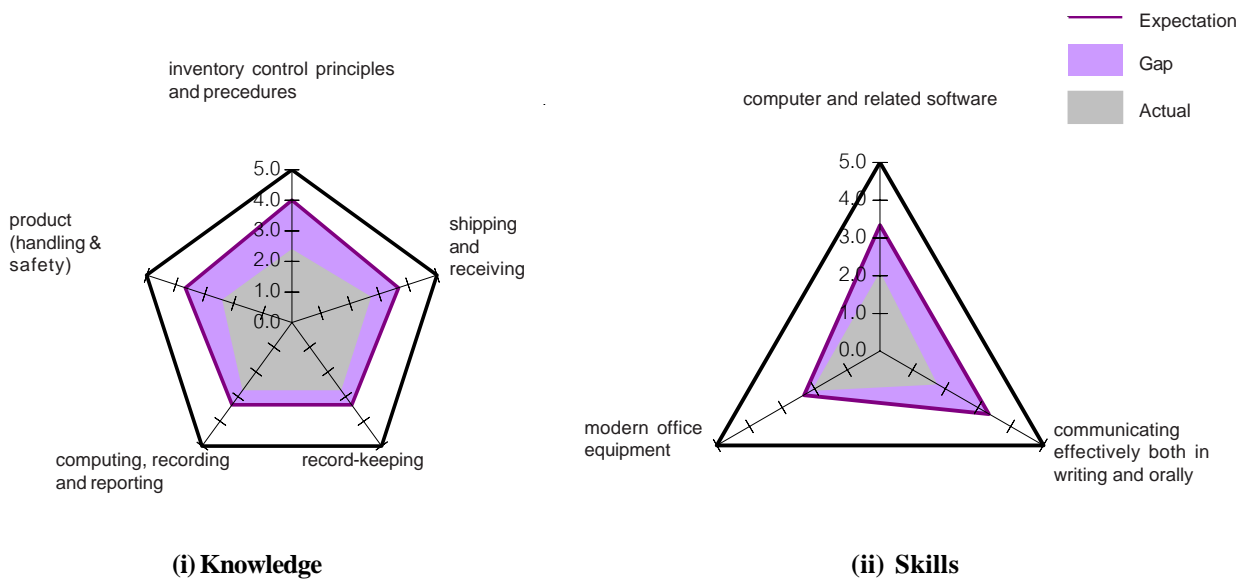


Source: Survey data.

Employers would like customs officers to increase awareness of critical knowledge required, specifically knowledge related to logistics and supply chain management. As for the critical skills set, computer, communication and analytical and planning skills fall well below the employers' expectations.

4. Inventory-Handling and Storage Officers

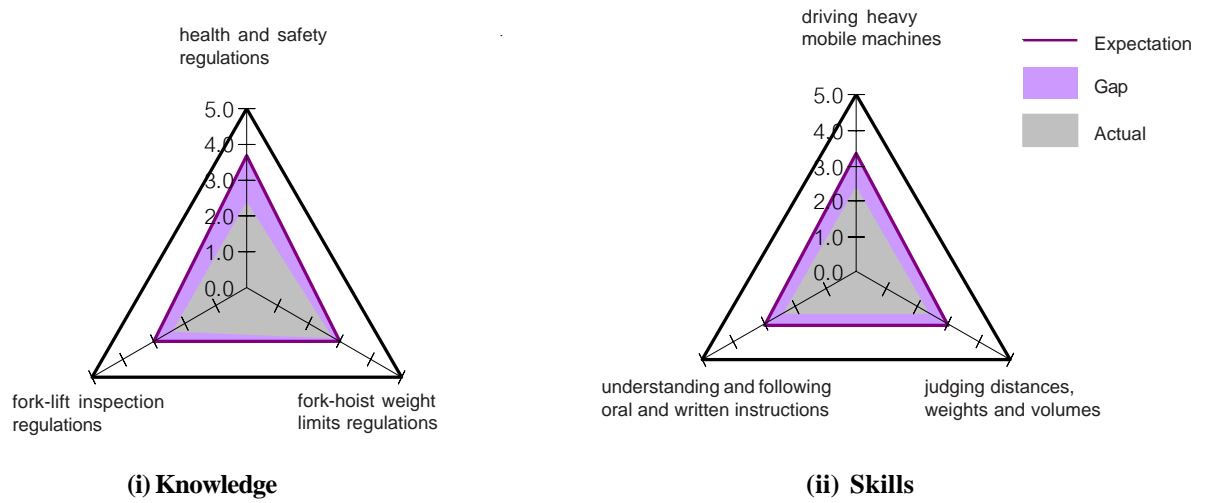
- Warehouse and Inventory Control Officer



Source: Survey data.

Aspects of critical knowledge that do not meet expectations include inventory control principles and procedures as well as handling and ensuring the safety of products. Critical skills that need improvement are computer and related software utilization as well as effective written and oral communication skills.

- Goods-Handling Officer

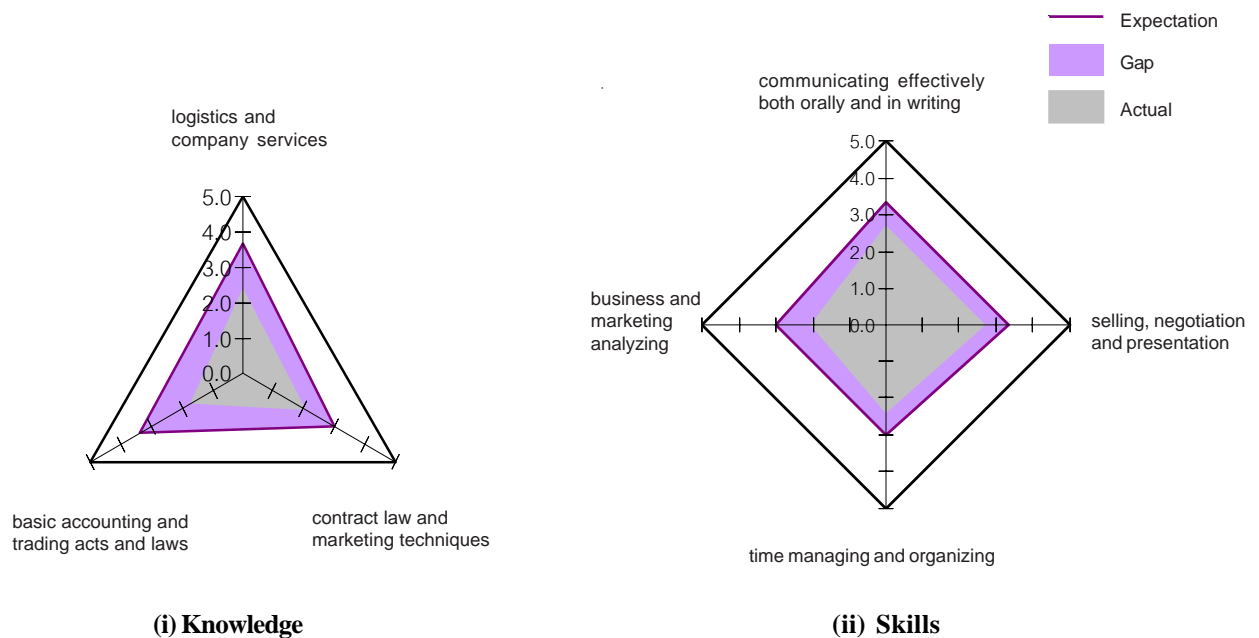


Source: Survey data.

It is expected that goods-handling officers would have a higher level of critical knowledge about health and safety regulations, but actual staff knowledge is far lower than expectations. Apart from driving heavy mobile machines, there is not much discrepancy in expected and actual levels of critical skills.

5. Marketing and Customer Service Officers

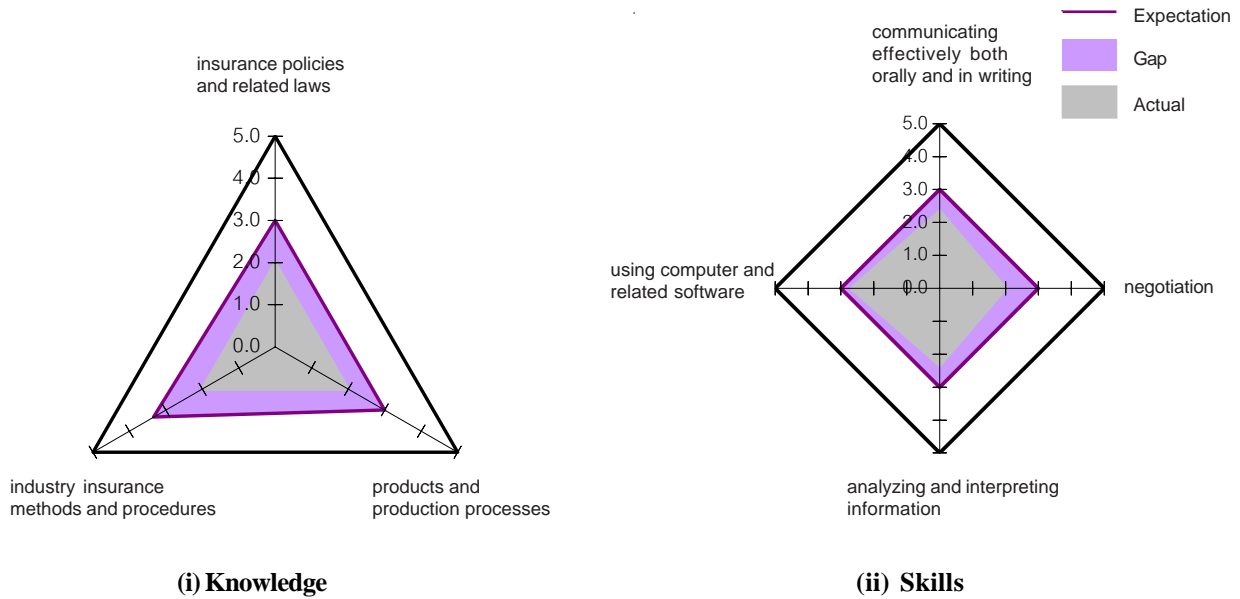
- Sales Representative



Source: Survey data.

There is a large gap in expected and actual levels of critical knowledge regarding logistics and company services, basic accounting and trade law as well as marketing techniques. The gap is less for critical skills, with the exception of business and marketing analytical skills.

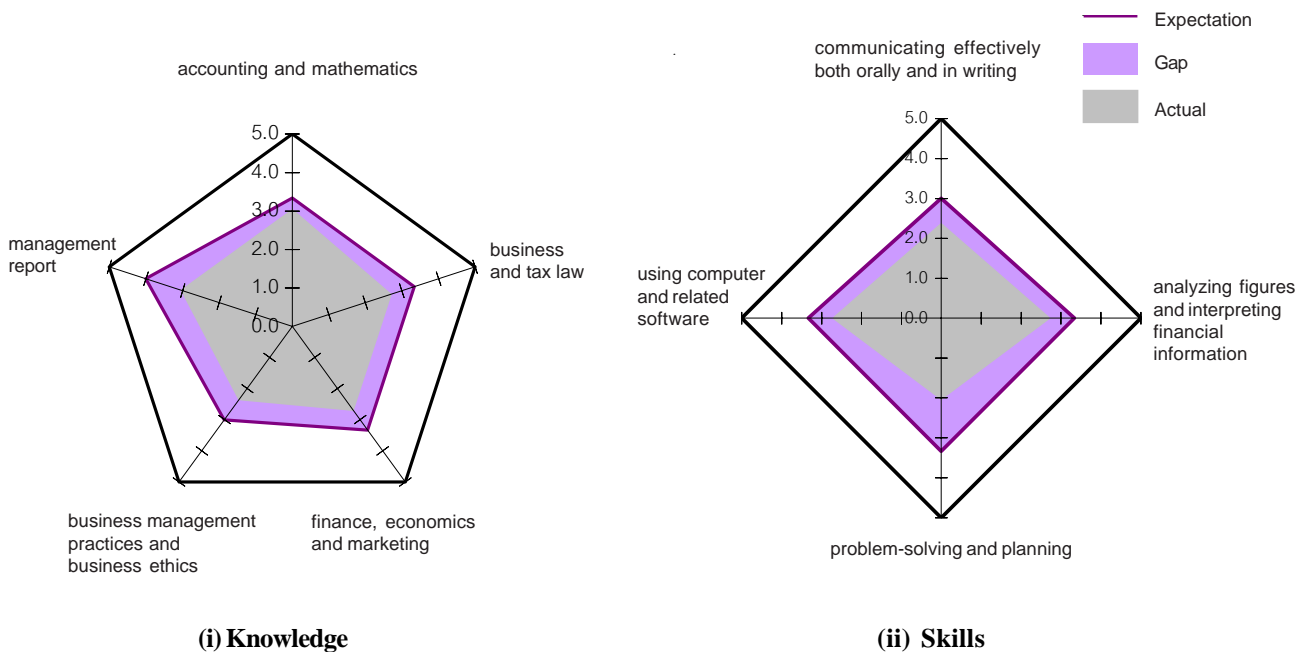
- Customer Service Representatives



Source: Survey data.

While critical skill sets, apart from negotiation, are near satisfactory, expectations still exceed actual critical knowledge in all areas, most specifically insurance methods and procedures.

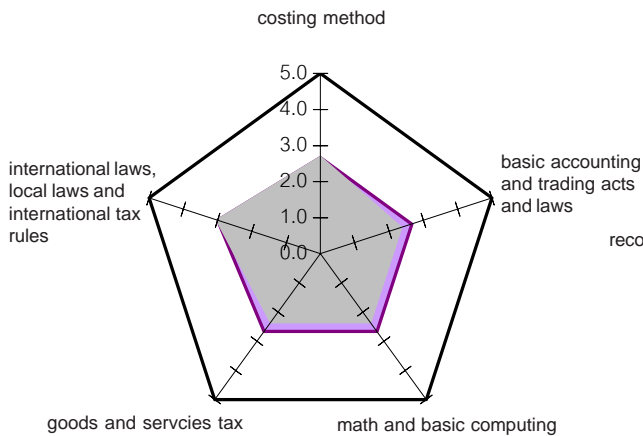
- Financial Accountant



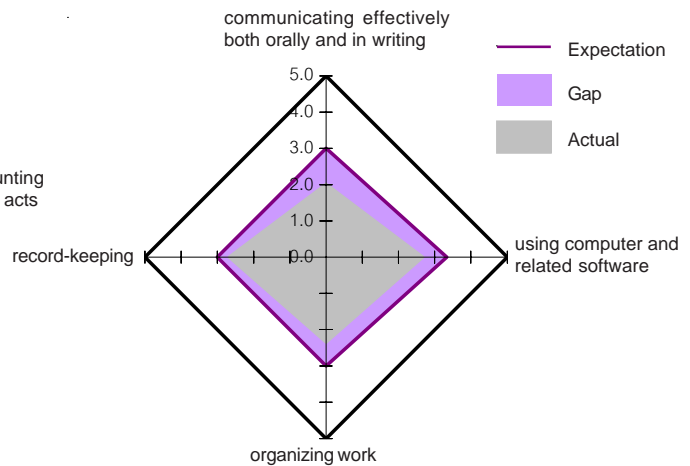
Source: Survey data.

Employers have high expectations for financial accountants to have critical knowledge of management reporting, yet actual knowledge falls below these expectations. Problem-solving and planning are the critical knowledge skills that are in most need of improvement, according to employer’s feedback.

- Accounts Clerk



(i) Knowledge

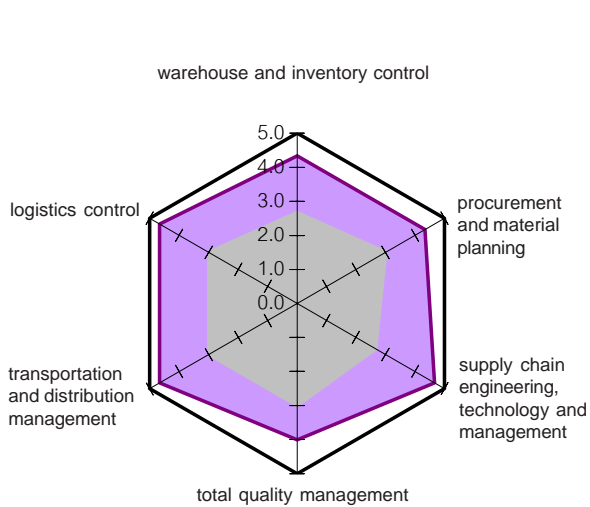


(ii) Skills

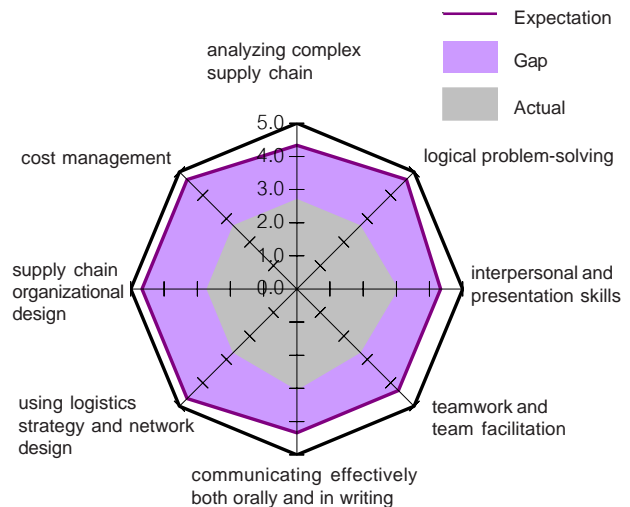
Source: Survey data.

There are nearly no discrepancies between the expectations and actual critical knowledge levels. Nonetheless, slight gaps still exist for critical skills, especially effective oral and written communication skills.

6. Supply Chain Consultants



(i) Knowledge



(ii) Skills

Source: Survey data.

Employers have the highest expectations for both critical knowledge and critical skills sets in all relevant areas required. They expect employees in the field to possess in-depth knowledge and expertise in their specific tasks, as well as possess the ability to manage, consult, analyze, communicate and facilitate operational procedures as well as implement innovative ideas while upholding internationally accepted standards. Nevertheless, employees in this area seriously fail to meet the high expectations in every department, including critical knowledge of warehouse, inventory and logistics control, procurement and material planning, transportation and distribution management as well as supply chain engineering. Critical skills that fall well below par include analyzing complex supply chain models, problem-solving, interpersonal and presentation skills, teamwork and facilitation, linguistic and communication skills, logistics design and network design, supply chain organizational design as well as cost management.

The evaluation of knowledge/skills expectations and actual expertise for each occupational position based on the value chain of logistics can be summarized in Table 2.

4. LABOR SUPPLY

4.1 Quantity of Labor Supply

It is estimated that workers with sufficient competencies⁴ to enter the logistics system will increase from 240,850 in 2004 to 272,329 in 2009 (Figure 3).

From these estimates, it is clear that there is sufficient quantitative labor supply to meet industry demands, as the number of students in relevant fields are sufficient to meet the industry's growth and increasing labor demand (refer to Figure 1 in Labor Demand section). Therefore, students can be attracted to the logistics business through the creation of incentives, the standardization of a proper career path in logistics, while at the same time providing them with a better understanding of career advancement prospects in the area of logistics.

4.2 Developing Staff from Educational Institutions

Seven universities currently produce staff to enter the logistics workforce, at an annual rate of 332 workers. In the future, this number will increase to 457 per year.

Also, four institutions offer short training courses that currently produce 1,953 workers per year, with future estimates at 2,771 workers. Combined, these educational institutions currently produce workers that can directly enter the logistics industry at a rate of 2,285. This number is expected to grow to 3,228 in years to come.

Each educational institution provides different knowledge and skill bases according to the know-how and expertise of that institution.

Those that place emphasis on developing knowledge bases and technical know-how can be divided into two groups:

(1) Institutions that emphasize business-related knowledge that derives know-how from business administration, compiling documents, business communication and utilization of office accessories required for business management, and

(2) Institutions that place emphasis on technical expertise that derive know-how from technical subjects such as science, engineering, systems design and technical equipment used in the transportation industry.

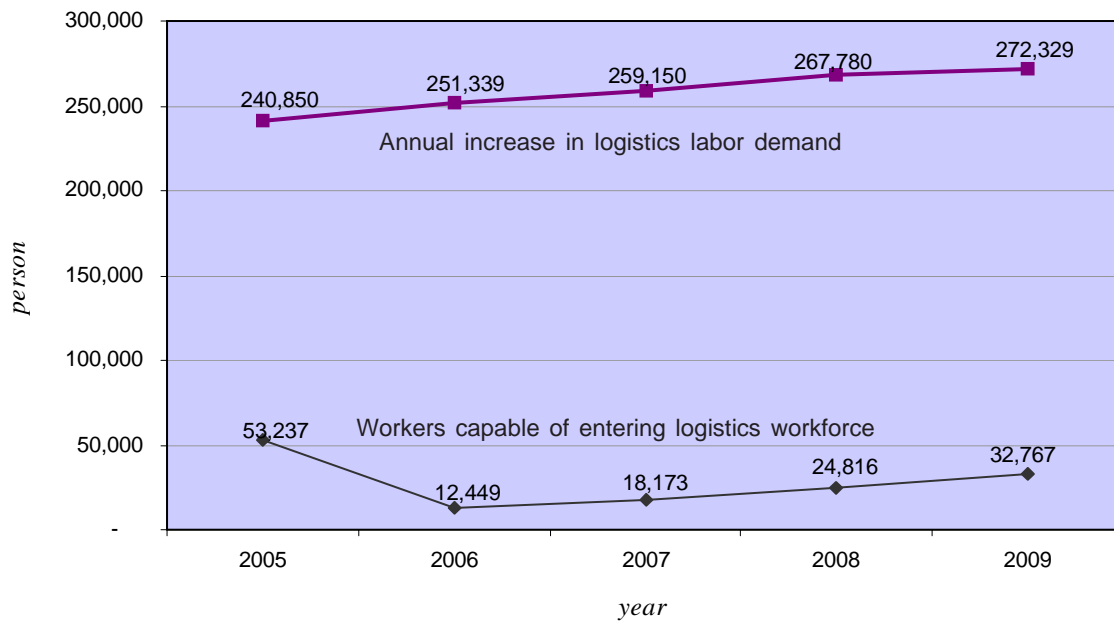
Institutions that provide the development of vocational staff and thus place more emphasis on developing key skills can also be divided into two groups: (1) Institutions that develop management skills and (2) those that hone operational skills. When considering both knowledge-base institutions and skills-based ones, four types of institution can be classified, as in Box 1.

Table 2 Summary of Discrepancy between Expectations and Actual Key Knowledge/Skills

Area	Critical knowledge gap	Critical skills gap
Purchasing officers	Wide knowledge gap in areas of purchasing principles, practices and procedures	Discrepancy in ability to use relevant software programs, especially in e-commerce
Transportation officers	Knowledge about scheduling and dispatching transit routes, safety regulations and procedures, international transport and customs law needs to be propped up	Wide skills gap in computing, effective oral and written communication, prioritizing work to meet deadlines, customer service
Export officers	No notable gap between expectations and actual knowledge ⁱ	Computing, communication, analytical and planning skills fall below expectations
Inventory-handling and storage officers	Insufficient knowledge to meet demand in inventory control principles and procedures, product handling as well as health and safety regulations	Computing and software utilization as well as effective written and oral communications skills need improvement
Marketing and customer service officers	Wide qualitative knowledge discrepancy in logistics and company services, basic accounting and trade law as well as contract law and marketing techniques	No notable gap between expectations and actual skills ⁱ
Supply chain consultants	Skills fall well below expectations in nearly all areas, namely knowledge of warehouse, inventory and logistics control, procurement and material planning, transportation and distribution management as well as supply chain engineering, technology and management	Skills fall well below expectations in all areas, including analyzing complex supply chain models, problem-solving, interpersonal and presentation skills, teamwork and facilitation, linguistic and communication skills, logistics design and network design, supply chain organizational design as well as cost management

Note: ⁱ Sufficient knowledge/skills levels to meet expectations in most areas. In areas of discrepancies, the gap is narrow.

Figure 3 Estimates of Annual Increase in Labor Demand Compared with Workers Having Sufficient Capabilities to Enter the Logistics Workforce between 2005 and 2009



Box 1 Classification of Institutions Providing Logistics-related Knowledge/Skills

Group 1

Institutions that emphasize business-related administrative knowledge

Institutions in this group offer courses at the bachelor's and master's degree levels, with a knowledge-base in business administration, namely, (1) Master of Science in Supply Chain Management, Assumption University (ABAC), (2) Master of Engineering, Logistics Management, University of the Thai Chamber of Commerce (UTCC), and (3) Master of Commerce, International Transportation Management, Thammasat University (TU). Teaching emphasizes management and administrative aspects of business. The Federation of Thai Industries, in collaboration with the International Trade Center under the supervision of the United Nations Conference on Trade and Development (UNCTAD) and the World Trade Organization (WTO), provides short courses on Supply Chain Management to meet international standards.

Group 2

Institutions that emphasize business-related operational knowledge

Institutions in this category provide training courses for staff workers who are in the logistics system in order to increase work efficiency. They are (1) Institute of Transportation, Chulalongkorn University (CU), (2) International Transport and Business School (ITBS), and (3) Thai National Shippers' Council (TNSC); offer short courses on subjects such as transportation law, file management, insurance and strategies as well as organize

various seminars. In 2006, TNSC will offer mid-length courses for executives, using the Certificate in Logistics and Transport (CITL) curriculum.

As for the bachelor's degree level, Suranaree University is setting up a course on Logistics Management, which aims to combine operational know-how together with actual work in the industrial sector.

Group 3

Institutions that emphasize technical-related management skills

Most educational institutions in this category possess expertise in technical aspects such as science, engineering, commercial shipping and multi-disciplinary subjects, namely, (1) Master of Science in Logistics Management, Chulalongkorn University (CU), (2) Master of Science, International Transportation Management and Logistics, Burapha University, and (3) Master of Science in Logistics Management, King Mongkut University (Thonburi).

Group 4

Institutions that emphasize technical-related operational skills

This group of institutions emphasizes the development of staff that possess technical skills and expertise, such as the Logistics Engineering course, University of the Thai Chamber of Commerce (UTCC), which grounds its curriculum in Industrial Engineering, focusing on system design in order to decrease capital investment cost, in addition to strategic management skills.

From the diagram below (Figure 4) it can be seen that there are very few institutions that offer courses emphasizing technical-related operational skills. This is reflected in the discrepancy between expectations and actual skills in the logistics industry. The institutions in this category are ones that should provide vocational courses for, say, vehicle drivers, who may then be able to meet expectations in aspects such as English-language communication and product handling and safety.

The dark-shaded area in Group 2 (business-related operational knowledge) and Group 3 (technical-related management skills) represent knowledge and skills that cannot be learned academically, but must be accumulated through actual work experience.

The light-shaded area in Group 1 (business-related administrative knowledge) and Group 4 (technical-related operational skills) represent those that receive academic qualifications directly relevant to the field of logistics, such as business administration. These workers range from Chief Executive Officers to laborers such as drivers, who must also have an understanding of the logistics industry.

5. CURRENT LIMITATIONS OF LABOR IN THE LOGISTICS SYSTEM

Currently, the major limitations that hinder prospects for developing workers for the logistics field are:

1. *Lack of educational institutions that develop graduates directly related to the logistics industry:* There are very few institutions that offer courses directly related to logistics, especially for lower-tier laborers and staff that are educated up to the vocational level. Although there are currently several short training courses, it is still not enough to meet market demands.

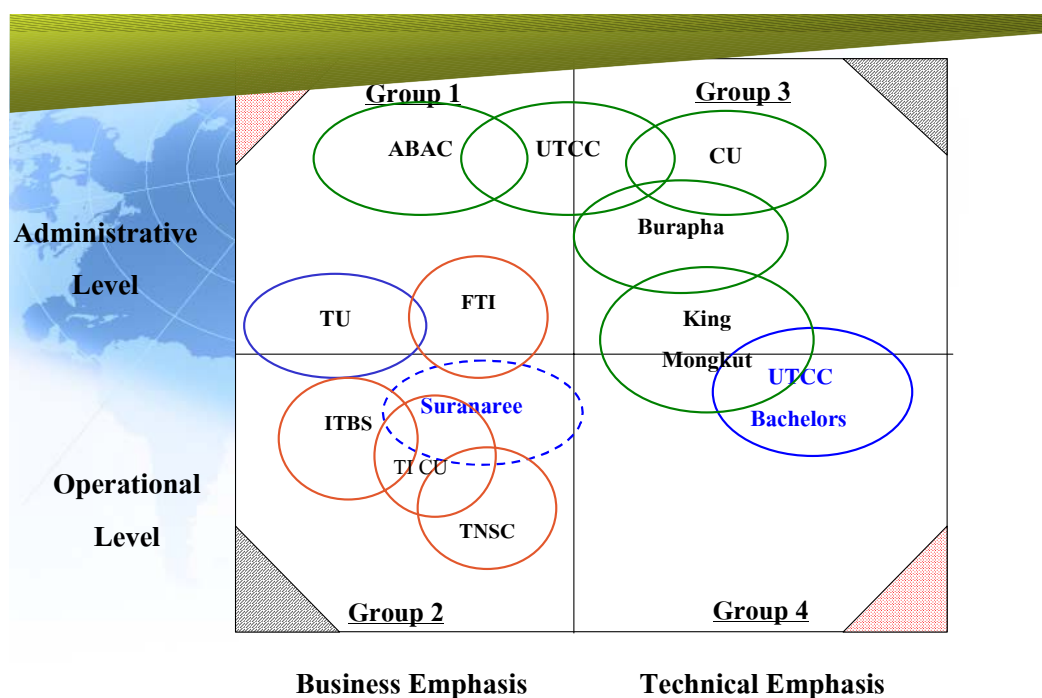
2. *Lack of qualitative labor:* There is a shortage of workers who possess knowledge and expertise in communications technology, while many laborers still do not have adequate English-language communication skills. Many still lack an understanding of the logistics industry as a whole, particularly the functions of supply chain management. This leads to ineffective operations and inefficiency throughout the entire system.

3. *Shortage of professionals who have direct knowledge and relevant experience on logistics but lack of research and development (R&D) funding:* This shortage is due to the fact that the logistics field in business is relatively new; hence, there are few who previously studied in this area. Apart from this, there is insufficient coordination between the public and private sectors in sponsoring R&D that can be applied to the logistics system.

6. STRATEGY FOR QUALITATIVE HUMAN RESOURCE/LABOR/STAFF DEVELOPMENT TO MEET DEMANDS OF THE LOGISTICS INDUSTRY

From evaluating both quantitative and qualitative demand (labor requirements) and supply (educational institutions that develop staff) in the logistics industry, as well as the current limitations as discussed above, it can be concluded that the process of developing qualitative labor to meet demands in the logistics industry must be accelerated. The research team recommends three strategic areas that should be further developed: (1) knowledge-bases, (2) skills/expertise, and (3) educational institutions and professionals. There should be a short-term and long-term time frame for implementation as shown on page 25.

Figure 4 Course Curriculum of Educational Institutions



Strategy	Knowledge-base Development	Skills/expertise Development	Development of Educational Institutions/Professionals
Short-term Strategy	<ul style="list-style-type: none"> - Increase the capacity of training courses, specifically in areas directly related to logistics, by improving the short training curriculum. - Increase understanding and awareness of the logistics industry for executives and laborers alike, via mid-length training sessions. 	<ul style="list-style-type: none"> - Improve the curriculum and teaching methods for foreign languages. - Support the establishment of courses and training sessions. - Encourage coordination between educational institutions and employers in initiating hands-on internship projects for students. - Organize basic operational skills-related training sessions for fresh graduates. 	<ul style="list-style-type: none"> - Public sector sponsorship for educational institutions that offer courses directly related to logistics. - Request foreign assistance to organize exchange programs between experts. - Create a standardized curriculum and linkage between courses for the sharing and distribution of know-how/expertise.
Long-term Strategy	<ul style="list-style-type: none"> - Develop educational institutions that open courses directly-related to logistics, placing particular importance on logistics laborers. 	<ul style="list-style-type: none"> - Educational institutions should set up logistics research centers and offer consultation to business and industrial sectors while using know-how gained through operations to develop professors, students and logistics employees. 	<ul style="list-style-type: none"> - Continuously increase competencies of professionals and education staff in theoretical, technical and operational aspects via processes such as granting scholarships for further study in courses directly related to logistics. - Establish an institute to standardize the logistics profession by registering/licensing occupational permits.

ENDNOTES

- ¹ NESDB commissioned TDRI to conduct this study in 2004.
- ² The Council of Logistics Management (CLM) defines “logistics” as the process of planning, implementation and control of the movement of goods and services to and from destination, as well as the storage and maintenance of products, services and relevant information in an effective and efficient manner, from the initial stage of production to the final consumer destination according to the needs of the customer.
- ³ Analysis results taken from interviews and brainstorming sessions by key informants in logistics systems to determine important staff members in the system’s value chain, based on labor demand four years from now (in 2009).
- ⁴ Defined as those educated in academic fields that offer basic logistics-related knowledge relevant to work in the logistics system.

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