

Competence Development of Logistics Centers

Development of Logistics Centers in Southern Finland



Ulla Kotonen, Anu Suomäki (eds.)

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Lahti University of Applied Sciences
Lahti 2012

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The publication series of Lahti University of Applied Sciences

A Research reports

B Study material

C Articles, reports and other current publications

A publication of Lahti University of Applied Sciences

Series C Articles, reports and other current publications, part 114

Editor-in-chief: Ilkka Väänänen

Layout: Communication and Marketing Services, Risto Kurkinen

Cover: Owen Price / iStockphoto

ISSN 1457-8328

ISBN: 978-951-827-160-7

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FOREWORDS

The ESLogC project advances Southern Finnish Logistics Center Systems by developing operations and by producing new information on logistics centers. The project is funded by the European Regional Development Fund, and the participating communities and companies. ESLogC is implemented in cooperation with Technology Center Techvilla Ltd. (administrator), Lahti University of Applied Sciences (LUAS), HAMK University of Applied Sciences, Laurea University of Applied Sciences, Sykli Environmental School of Finland and Valonia - Southwestern Finnish Service Center of Sustainable Development and Energy Affairs from 1st Oct. 2009 to 30th Sep. 2012.

The ESLogC project consists of five sub-projects and 20 separate development projects. The three universities of applied sciences form a Logistics Center Competence Development sub-project which aims to improve Southern Finnish logistics centers' competitiveness by developing the competence and the competence management of logistics operators. The central themes in the Logistics Center Competence Development sub-project are 1) Competence mapping and competence development of logistics centers, 2) Surveys on logistics education and labor force demand, and 3) Development of logistics education.

This publication is part of the publication series produced in the Logistics Center Competence Development sub-project. It depicts the following actions carried out in the project: The definition of future competence demands in logistics centers, the result evaluation of the questionnaire based on those demands and the competence development plans compiled based on those results. The other publications in the series are:

1. Kotonen, Ulla & Suomäki, Anu & Sivén, Suvi (Eds.) Future Competence Assessment in Logistics Centers. (In Finnish)
2. Kotonen, Ulla, Tuominen, Ullamari & Suomäki, Anu (Eds.) Competence Development of Logistics Centers. (In Finnish)
3. Kotonen, Ulla & Suomäki, Anu (Eds.) Development of Logistics Education. (In Finnish)

All publications have been produced in cooperation with the ESLogC project operators and logistics centers involved in the project. For more information in Finnish about the project and other publications please visit the website: www.ESLogC.fi.

Acknowledgements: I wish to thank the participating logistics centers, the project personnel and the students in the universities of applied sciences for their valuable contribution in the long process of evaluating the future competence demands and compiling the development plans for the logistics centers.

In Lahti 30th April 2012

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THE ESLogC PROJECT: DEVELOPMENT OF LOGISTICS CENTERS IN SOUTHERN FINLAND

The logistics centers and areas have developed as important gathering points to the material and traffic flow in Finland during the last years. At the same time their functional and technical development has been very fast. Nevertheless the big picture of the broadness, character and common vision of the development of the centers is still lacking in Finland. According to the survey organized by LIMOWA – The Logistics Center Cluster in Finland – there are around 200-250 different sorts of logistics centers in Finland and they all have or they are planned to have a certain sort of function in transportation and logistics systems.

The logistics centers and freight villages are clusters, where information, cash and material flows meet in the supply chain. They develop more added value, especially to the manufacturing business and grocery sales sectors, than ever before. As the global activity of business keeps growing, the significance of the clusters is steadily rising. The energy efficiency and sustainability will play an ever bigger role; the centers will offer an opportunity to utilize intermodal transportation systems such as train and truck combination.

The region of Southern Finland forms a significant area for the logistics centers. To make it work effectively, it needs suitable cooperation partners both in Finland and abroad. The knowledge of the logistics and specialty knowledge of the logistics centers are both at a high level in Finland, although the systematic development and implementation of the clusters is lacking almost completely in the country. In order to keep with international competition, logistics and its related competences must be evaluated and developed according to the actual needs. In addition, the planning and execution of the present and new centers seems to lack a national vision, which is also highly demanded in the future.

The target of the ESLogC – “Development of the Logistics Center System in Southern Finland” – project is to give answers to the challenges related to the logistics center system. The idea is to collect information about the present and future logistics centers and to build future scenarios in order to help small and medium sized companies to make plans and decisions concerning their own logistics. The venture aims at gathering logistics center knowledge, building a model of recent location development and future scenarios, comparing ecological and sustainability perspectives with the current development projects and making guidelines for the development of public education. (Härkönen, J. 2012)

The venture started in October 2009, and it ends in September 2012. The total cost volume is 1.97 million Euros. The Program is coordinated by Technology Center TechVilla in Hyvinkää in Southern Finland, and it includes five partners. TechVilla has the responsibility to run tendering and coordinating operations between the fourteen consulting projects. The main work package and partners of the venture are shown in the figure 1.

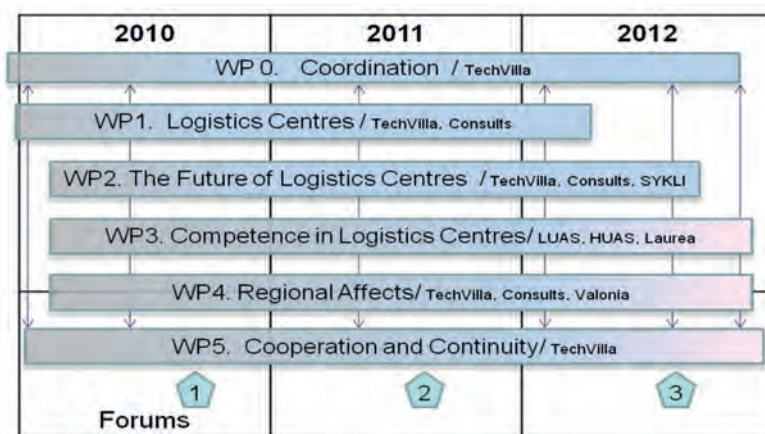


Figure 1. The work package and the partners of the ESLogC project.

To achieve the target, the entities related to the location, planning and future, operations and activity and competence of the logistics centers in Southern Finland were examined. The main content and results of these are introduced in the following chapters.

As a summary of the project, plenty of material on the development processes and functions of the logistics centers and areas were created. The study has been done both in the macro and micro level in centers. The information gathered is headed specially to the developers of the logistics centers, logistics operators and companies that work in the logistics intensive field. The results are gathered in an abstract form on a virtual platform called “Logistics Center Developer’s Desktop” – www.eslogc.fi. The desktop will provide two way-browsing results opportunity. The user can search articles either based on themes and topics, or they can open the map view. On the map, the visualization covers all notable logistics centers in Southern Finland.

Location of the Logistics Centers

As mentioned already in the introductory section, there is still a lack of general and common understanding of logistics centers as phenomena and the definition of them. According to Meidute (2005), logistics center is a new term, and Nagel, Proffitt, Toh & Oakden (2009, 347) see it as a relatively new phenomenon. Literature review (Lahtinen, 2010) concludes that there are lots of different kinds of logistics centers, and also Meidute (2005), Nagel et al. (2009), and Eckhardt (2010) classify different kinds of logistics centers based on e.g. their size, multimodality, service provided, etc. However, Rodrigue and Notteboom (2009) argue that those kinds of technical definitions are not enough, and they cannot portray the specific function of terminals in supply chains.

Therefore, we have to understand more deeply the roles of those logistics nodes in supply chains, but it will not be done in this analysis, which is however, made by modeling of transportation system, and choosing the optimal locations – based on transportation costs – in this network. To do that optimization, the definition of “logistics

center” needs still to be done. It is understood in this chapter “as a node in transportation system, where different transportation modes and product flows meet each other”. This node “makes it also possible to combine long and short transportation routes, as well as, transportation modes (intermodality), when there are more than one mode (e.g. road, rail, sea) available.” Hence, it is the easiest to interpret the results provided here, as a starting point for discussion where to locate large scale freight villages (FV) or Güterverkehrs-zentrum (GVZ) in Finland. In Eckhardt & Rantala (2010) classification those are close to definitions L1 and L2. There are also several additional types of logistics centers, central warehouses (L4), distribution centers (L4 or L5 depending on the size of center), and cross-docking terminals (L5), which could be located with different modeling criteria, like based on minimal distance or time, but basically it could be suggested, that those kinds of facilities could also be located under the broader provincial logistics center (or Freight Village). Our classification was done from the level 1 to 5 and L3 stands for open logistics centers and warehouses such as the operation points of the LSP’s. Additionally, several other factors would also need to be taken into account, like availability of land and skilled workforce, as well as, opportunities to achieve synergy benefits by collaborating with other companies in the same area, but those are discussed in more detail in the other parts of this large project.

The actual work and analysis have been done by Matrex Oy (Ltd.) (2011) and with FRISBEE-model and computer software package. This kind of analysis requires data, and several data sets from the Finnish Statistical Center have been used including national import and export measured in tons for each product category. FRISBEE-model itself already includes transportation routes (roads, railways, ports, seaways) and costs, frequencies, risks, and other dimensions related to them. The target of the study was to “find out optimal locations for logistics centers in Southern Finland by minimizing the transportation costs at national economy level.”

To achieve this target, several scenarios were made and analyzed. In the beginning, it was supposed that there will be logistics centers at least in Turku, Helsinki-Vuosaari Harbor Area, Vantaa Ring road III, Kotka, Hämeenlinna, and Lahti. The next step was to evaluate the next best locations. In the first scenario, the current product flows were evaluated, and the second scenario included forecasts of population growth in each sub region (LAUI and in greater Helsinki Metropolitan area in more detail based on municipalities, which were also the potential locations in the study) and it was assumed that the traffic flows will change at the same rate with the changes in the number of inhabitants in each region.

The third scenario takes into account potential increase (15%) in road transportation costs, and the transfer of traffic flows from the roads to railways were also evaluated. In the fourth scenario, the two locations from original assumptions – Hämeenlinna and Lahti – were cut off, and the results indicated Lahti as an important area to locate a logistics center, while the results for Hämeenlinna were not so clear, because there are several other good locations close to it. In the fifth scenario, the potential infrastructure development in Hanko Harbour area and congestion in the metropolitan area were added to the model. The results clearly indicated that those developments have an impact on the changes on transportation routes, and then to optimal locations.

As a conclusion for the first five scenarios the following points have to be remembered. First, the results must be interpreted carefully and with caution, and an understanding of this stepwise model is required. Second, all scenarios results were quite well aligned with each other, and indicated robustness of the model generated and used. Third, adding a new logistics center to the model gave less savings for the total transportation costs than the previous center. Overall, it seems that the most savings, approximately 90-95%, will be achieved by increasing the number of logistics centers by only 5-6 in the 6 provinces which belong to the whole of Southern Finland. The last point is well in line with the other studies (Henttu, Lätti & Hilmola 2011).

The sixth scenario evaluates the competitiveness of Southern Finnish transito route against Estonian and Latvian ones from the Netherlands (Rotterdam) to St. Petersburg and Moscow in Russia. This scenario indicated that, based on the costs, the Finnish route is the best option at least to St. Petersburg, and Finnish logistics centers are important in this route. Furthermore, it also showed that if one logistics center from the southeastern part of Finland is not functioning, only a part of that volume will transfer to another Finnish logistics node, while the other part will go via Estonian logistics centers in the future.

Planning of the Centers

The planning of the logistics centers traditionally consists of the planning of the area, building and functions of the centers. As there are many types and sizes of centers, in the beginning of the planning it is important to clarify the function and role of the center. To become aware of this process, the model for the future logistics center was studied and created in the ESLogC project by Pöyry and VTT (2011). It is a concept that draws different functions for each member in the developing process. The concept is called “the Ideal Developing Process in the Planning of the Centers” and it is shown in the chart 1. The process has been described below in three different levels of centers: L2, L3 and L4. It gives a comprehensive picture of each participant’s role in the developing process in different sorts of centers.

Table 1. The ideal developing process of the logistics centers. (Pöyry & VTT 2011).

Phase of the process	L2	L3	L4
Decision of the location	National evaluation	Global/national evaluation	Evaluation of own system
Leader of the project	Community / cooperation of the communities	Operator	Operator
Basis of the operation plan	Business concept	Providing of the service	Strengthen of the operation
Concept of the provided service	Wide	Tailored according customer needs	Service for own needs
Facilities	Part of the traffic infrastructure, local planning	Needs of the investor / operator	Needs of the operator
Modes of the transportation	Several	Typically several	One or few
Cooperation	Transportation corridors, communities, other municipalities	Sales and industry, logistics centres	Positioning to the markets

A crucial part of the planning is also to take into account the sustainability of the building and functioning. As regulations keep tightening, the energy and life cycle solutions will become more important in the future. The ecological issues were researched in the project. The studied areas included the centers' carbon footprint, energy solutions, waste management and life-cycle processes.

The same was true for safety issues of the centers. Security can be an essential factor of competence especially for global companies. In addition, as the centers are growing bigger, more multifunctional and international, the more the importance of security is emphasized. To notice this, safety and security issues were studied broadly in the project by 3T Solutions Ltd. (2011) and gathered in a practical form to the Developer's virtual desktop (www.eslogc.fi) alongside the other outcomes of the ESLogC.

To benchmark the best practices, the international examples were summarized on the web page. The benchmark in this consists of the centers in Italy and Germany. Terms Interporto and Güterverkehrszentrum were introduced as part of the results. The examples showed that especially the importance of intermodality has grown in the supply chain management in the Europe. To meet the international standards more extensively, the Finnish centers should also adapt this European way of the handling of cargo.

Operations in the Centers

As to handling the location and planning issues of the centers, the operation functions should also be taken into account. To understand the importance of the operations inside the logistics centers and areas, the main functions and techniques of intralogistics were described in the project by Class One Solutions (2011). The modern techniques of warehouse management were gathered at the CeMAT-fair organized in Hannover 2011 to complete these results. In addition, the features of ICT-systems and identification methods in the supply chain, such as bar-code and RFID, were studied and introduced in the results (VTT, 2012). This has been done to give a broad view of the operations related to cargo and material handling in the centers.

Mostly there are many different companies that operate in the same logistics area. The companies usually need the same sort of functions in their daily operations; transportation, other logistics operations, IT, waste management, security and other services that are often purchased from different service providers. These functions are important to core business, but they are mostly recognized as side costs that won't produce so much value to the end product or service. However the level of the core business can be promoted if the side operations work effectively. One way to influence is to affect the costs of these indirect costs. The cooperation with similar companies in the same area is a tool for that. Intercompany cooperation can create economies of scale to purchasing, improve the level of the service purchased and also create new business opportunities both to the purchasers and service providers. A study of joint purchasing was done in the project and documented by Turku University of Applied Sciences (2011).

Competence in the Centers

It is also important to develop logistics skills and capabilities to achieve more effective and efficient logistics systems. As Coleman (1990) has stated in social systems, also in logistics we are generally interested in the outcome of a system. For a firm it could bring profitability and for the economy growth and sustainability. These come from competitiveness, and companies try to achieve sustainable competitiveness via competitive advantages. In addition, for an individual employee, skills and competences are also important factors. In the case of logistics skills and SCM capabilities, we are – in fact – interested much more in the performance or the competitiveness they are able to generate both for a company and for the total economy, instead of an individual employee. But as stated above and based on Coleman (1990), the practical work of influencing other levels has to be done at the individual level. And also in this project we have done this with several organizations and with an individual level as described below in several subsections. Ulrich (1987) has combined these two. Because the development of organizational capabilities is critical in utilizing the other sources of competitive advantage (economic, strategic, and technological), human resources professionals are needed to be linked directly to the development processes. But this generally requires also for them the acquisition of new competences that they are able to involve in strategic decision making inside their organizations.

According to Peltola (2008,18), the terms competence and capability are used interchangeably in the literature, but Armstrong (1998) suggests that competence describes what people need to be able to do to perform their jobs well. In addition, competency is seen here as a demonstrated ability including knowledge, skills, and attitudes to perform a task successfully according to standards. The definition of capability relates also to the description “scm offers the opportunity to capture the synergy” (Lambert et al. 1998), and then it is a more general construct to measure and study, and also close to Hitt’s (2011) “resource orchestration addresses managers’ role in structuring, bundling and leveraging the firm’s resources”. Furthermore, like Fine (1998, 71) has expressed: “A company is its chain of continually evolving capabilities – that is, its own capabilities plus the capabilities of everyone else it does business with.” This will then be an extension to RBV (Resource-Based View of the Firm), it is not only the question of resources (capabilities) the firm possesses, but also its capability to utilize external resources.

There has also been a rapid development in logistics centers. These have changed the structure of the supply chains, because there have been lots of competitive pressures to do so. Traditionally, managers and executives seek competitive advantage through economic, strategic, and/or technological capability, however, those are not enough anymore. Barney and Hesterly (2006, 130-131) pointed out that because those previous strategic management or organizational economics theories cannot totally explain the differences between companies and their performance, it is suggested to take into account also the firm’s unique resources and capabilities – and human resources, skills and competences, as an important part of them (Kotonen et al. 2011). Managers and executives also have to develop organizational capabilities through better deployment of human resources, because organizational capabilities represent the capacity of the organization itself to change and adapt to financial, strategic, and technological transformations in business landscape (Ulrich 1987). These capabilities need to be developed and deployed in order to adjust to the new requirements.

However, based on this viewpoint, it is not only a question of skills to do logistics tasks as functions, but also the capabilities for supply chain management as a process. It is important in the future also to explain the existence and development of logistics nodes, their boundaries, structure and organizations for the logistics center, as well as their heterogeneity and their performance. That will help to understand the possibilities of logistics centers, their management, and especially their roles in supply chains and competitiveness of the system.

Furthermore, we have lots of companies here in Finland involved in the development of logistics centers. Those companies have formed LIMOWA - Logistics Center Cluster - in order to design, construct, develop, and operate logistics centers. Several companies that have specialism in materials handling, ICT, consultancy and education etc. related to logistics are located here. According to Porter (1998), a cluster is an alternative way of organizing the value chain, but more generally it could be seen here as an external factor for the capabilities and competitiveness of corporations. Thus, logistics centers and logistics clusters are distinguished here: the former is an internal factor in which companies using the same center have horizontal collaboration between each other, and the latter is an external factor. In addition, Ballot & Taymaz (1997) suggested that innovators fare better than imitators on average, not only because they innovate, but also because they build a competence base, which supports the learning from other firms, and therefore, we have to attempt to acquire the knowledge needed from our supply chain partners, companies using the same logistics nodes, and clusters supporting their development.

Sandberg & Abrahamsson (2011) have concluded “that a sustainable competitive advantage is based on a combination of efficient and effective logistics operations and well- functioning, adjusted, in-house developed IT systems. This operational capability is in turn sustained through five dynamic capabilities: Managerial knowledge and presence, Cross-functional teamwork, Control, Learning, and Supply chain relationships.” All of these are important dimensions here in Finland, and are studied here to develop logistics skills and capabilities in Finnish logistics centers and enhance the productivity and competitiveness of them. Simultaneously it is also important to develop logistics education to ensure the availability of highly skilled and motivated logistics employees in the future.

As for educational development, the three participating universities of applied sciences have published a skill chart for the “Future Logistics Center” as a result of their covering work with 38 logistics centers and public organizations. The chart can be used as a planning instrument for any company considering their resources. As mentioned earlier, this broad process of competence development of logistics will be described and analyzed in detail in this paper.

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Ulla Kotonen, Matti Jääskeläinen & Taru Kitinprami

THE ESLogC PROJECT: LOGISTICS CENTER COMPETENCE DEVELOPMENT SUB-PROJECT DESCRIPTION

Logistics center competence development sub-project is a part of the Southern Finnish Logistics Center System Development project (ESLogC) that is administered by Technology Center TechVilla Ltd. The Logistics Center Competence sub-project's goal is to enhance the Southern Finnish logistics centers' competitiveness by improving the logistics operators' competence and developing competence management.

The central themes of the project are:

1. Logistics center competence mappings and competence development
2. Education and labor demands' mapping in the logistics field
3. Logistics education development.

Competence Management and Development in Finnish Logistics Centers

The logistics center competence mappings and competence development has been a seven-step process:

1. The compiling of company and occupational group -specific competence charts, personal competence assessment forms and competence matrixes.
2. The defining of the competence needed at the future logistics center and in the logistics operations
3. The compiling of the occupational group competence charts based on the future competence demands
4. The compiling of the future competence assessment survey
5. The compiling of the company-specific competence development plans
6. The compiling of occupational group competence development plans
7. The description of the methods used in the competence development

In the first step of the project, the competence charts were compiled for the participating companies' logistics operators (altogether 120 charts). The compilation was executed by using workshop method. The mapped occupational groups included logistics management positions, superior and expert roles and operational tasks. On the basis of the competence charts, company-specific, personal competence assessment forms were created for each occupational group aside with competence matrixes which the companies can utilize as management tools, for instance in development conversations.

In the second step the future logistics center and the competence needed in its operations were defined.

On the basis of the future competence definition, the competence charts based on the future competence demands were compiled for the following occupational groups: Logistics management and planning, warehouse superiors, warehouse workers, purchasers, forwarders, distributors, drivers, customer service and sales and support services.

Based on the future competence charts, the project group realized a competence assessment survey in logistics centers that strove to analyze different logistics professions and participating logistics centers' future logistics competence, the competence development needs and the methods used in competence management. And based on that analysis occupational (Logistics management and planning, warehouse superiors, warehouse workers, purchasers, forwarders, customer service and sales) development plans that defined the development emphases, measures and methods were created for the occupational groups. Possible crisis situations were also discussed within the development plans in that case if the competence was not developed. Survey participants also received company-specific occupational group conclusions where company-specific competence was compared to the occupational group's general competence. Occupational groups' competence charts can be found at the end of this publication.

The execution of the Future competence assessment survey has been shortly depicted in the article *Competence Assessment in Finnish Logistics Centers*. The survey results and the competence development emphases and measures have been presented in the article *Competence Acquisition in Finnish Logistics Centers*.

Labor Demand and Logistics Education in Finland

Logistics industry's educational and labor demands were clarified simultaneously with the competence mapping. The educational and labor demand report was divided into four sections. In the first section, Southern Finnish employment authorities' views of logistics industry's work placement and applicant situation were explored. The second section focused on studying the views of the recruiting companies transmitting logistics jobs about the developing situation of logistics field work placement and applicants and the applicants' educational needs. The third section included the labor demand survey for the logistics centers that cleared the Southern Finnish logistics centers' views on logistics industry's personnel number and structure as well as their development in the future, possible recruiting issues and plans about labor leasing and outsourcing. The survey inquired the current personnel's needs for continuing training and the logistics center operators' views on present logistics education and its development needs.

The results of the education and labor demand mapping have been examined in the article *Demand for Skilled Labor in Finnish Logistics Centers*.

In addition to the education and labor demand report, other research material concerning the new information about the future competence demands produced during the ESLogC project was utilized in the development of logistics education

The development of logistics education consisted of the following measures:

1. The mapping of the logistics education provided
2. The comparison of the provided logistics education and the future competence demands
3. *Virtaa logistiikkaan* – logistics competence seminar
4. The definition of logistics educational development needs for separate education standards
5. the initiation of education standard -specific development measures

The development of logistics education began with the Finnish logistics education mapping which included the secondary, the higher vocational and university degree education and the fee-charging continuing education provided by different organizations. University education was also compared to certain European universities and to the logistics education provided in them.

In the second phase the current logistics education was analyzed on the basis of the future competence charts, competence development plans, education and labor demands and the logistics competence seminar workshop results. The analysis took notice of the course execution, study module contents and the teaching methods.

During the third phase, partly during the project and in parts after the project, logistics education development measures have been or will be initiated. In practice this means that for instance new logistics degree programmes are being designed and the current logistics education's study module contents and teaching methods are being reformed.

The current logistics education in separate education standards and the development proposals are discussed in part II of this publication.

Cooperating Companies and Organizations

Nearly 70 companies and public sector organization from different parts of Southern Finnish ERDF Programme region have participated in logistics center competence development sub project and its different steps.

Thirty six companies and two public sector organizations have taken part in the logistics center competence mapping and competence development measures. In addition to these, both public sector employment authorities and private sector recruiting companies participated the mapping of education and labor demands.

The logistics competence seminar that was organized in Lahti, Finland 8th December 2011, gathered 20 company representatives and 35 representatives from different education organizations. Additionally, several students and teachers from the project member universities of applied sciences and teachers and education planners from other organizations providing logistics education have participated in the logistics education development.

Project Organization

The logistics center competence development sub-project is coordinated by Lahti University of Applied Sciences Faculty of Business Studied and co-operated between HAMK University of Applied Sciences, Laurea University of Applied Sciences and Lahti University of Applied Sciences. It has been executed in close cooperation with the ESLogC project's other project operators and companies.

In addition to the project organization, several Bachelor and Master degree students from the implementing universities of applied sciences have taken part in the sub-

project. The students have contributed with learning tasks and theses, literature reviews and analyses.

Results from the ESLogC Competence Development

The main results of the competence development activities done in the ESLogC project are presented in this publication. More detailed results and descriptions of competence management and development activities are reported in three Finnish publications.

The rest of this publication is divided into two parts. Part I Competence Management and Development in Finnish Logistics Centers describes the process and methods of competence management and development carried out in the ESLogC project. Next the competence identification, competence assessment and competence acquisition phases as well as the results from these phases are introduced. In the end of Part 1, there is a short overview to the competence requirements concerning sustainable development in Finnish logistics centers.

The second part of the publication concerns Finnish logistics education. First, the results from the survey of the workplace and future demands for skilled labor are discussed. After that, the present state of logistics education in Finland and its development needs based on the results of the competence assessment survey are described. The logistics education analysis includes all educational levels and forms including higher education, vocational education and commercial further education.

PART I:
COMPETENCE MANAGEMENT AND
DEVELOPMENT IN FINNISH LOGISTICS
CENTERS

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PROCESS AND METHODS OF COMPETENCE MANAGEMENT AND DEVELOPMENT

This article examines competence and competence management. It also describes the ESLogC project's competence management process and competence mapping methods.

Competences

The logistics discipline has changed and grown over the last few decades. This has also meant changes in knowledge, skills, and competences needed in different logistics functions (Dischinger et al., 2006; Mangan & Christopher, 2005; Murphy & Poist, 2007). According to Peltola (2008, 18), the terms competence and capability are used interchangeably in the literature. Job competences describe characteristics of an employee that are required to perform a job effectively (Armstrong 1998; Boyatzis 1982; Marrelli 1998; Dubois 1998; Jackson & Schuler 2003). This kind of job-related competence definition includes both an individual and a collective level of competences. In which, individual level consists of individual knowledge, skills, attitudes and behaviors, and collective level correspondingly consists of collective team, process as well as organizational capabilities (Athey & Orth 1999).

The use of competences and skills in human resource management is not something new (Vakola et al. 2007; Shippmann et al. 2000). Competence based approaches have been used in many organizational functions, such as workforce and succession planning and performance appraisal for several years (Draganidis & Metzas 2006). Despite that, the operation and implementation of competence management systems are still seen as a complex and lengthy process. Competence management is a process in which the appropriate competences for an organization and the appropriate competence model are defined (Athey & Orth 1999). It is a way in which organizations manage the competences of the organization, the groups and the individuals. Its primary objective is to define and maintain competences based on the objectives of the organization. (Berio & Harzallah 2006) It provides a tool for identification of the skills, knowledge, behaviors and capabilities needed to meet current and future personnel needs and to develop plans to eliminate the gap between actual competences and the competences demanded by a job (Draganidis & Mentzas 2006). Competence management requires not only the compiling and documenting of information on intellectual capital but also regular development discussions, possible workplace counseling and mentoring, and also cooperation with competence partners such as educational institutions.

According to the Ministry of Transport and Communication (2010), the logistics competence level in Finnish companies is quite high. The three main logistics competence development issues in Finland are demand & supply planning, purchasing, and distribution strategy. Senior-level logistics managers need to be proficient in three categories: management skills, logistics skills, and business skills. The importance of good communication skills for today's logisticians is also emphasized, both upward and downward communication within the organization as well as the ability to com-

municate across functions and organizations and to coordinate SCM. (Murphy & Poist, 2007; Gammelgaard & Larson 2001; Mangan & Christopher, 2005)

Because business processes are the means by which customer value is created in any business, there is a strong logic in arguing that process management rather than functional management should be the basis for organizational design (Mangan & Christopher, 2005). The implication of this re-orientation is that the supply chain manager of the future will require a “T-shaped” skills profile, which means that effective process management requires significant cross-functional skills, and managers have to have in-depth expertise in one discipline combined with enough breadth to see the connections with others. The key business transformations and implications for management skills are presented in the Table 1. The most relevant issues for our study are highlighted.

Table 1. The key business transformations and implications for management skills (Mangan & Christopher, 2005; Christopher, 2004)

BUSINESS TRANSFORMATION	LEADING TO	SKILLS REQUIRED
From supplier to customer-centric	The design of customer-driven supply chains	Market understanding, customer insight
From push to pull	Higher levels of agility and flexibility	Managements of complexity and change
From inventory to information	Capturing and sharing information and real demand	Information systems and information technology expertise
From transactions to relationships	Focus on service and responsiveness as the basis for customer retention	Ability to define, measure and manage service requirements by market segment
From “trucks and sheds” to end-to-end pipeline management	A wider definition of supply chain cost	Understanding of the “cost-to-serve” and time based performance indicators
From functions to process	The creation of cross-functional terms focused on value creation	Specific functional excellence with cross-functional understanding. Team-working capabilities
From stand alone to network rivalry	More collaborative working with supply chain partners	Relationship management and win-win orientation

Competence Management Process

The competence management process can be divided into four main processes: 1) competence identification, 2) competence assessment, 3) competence acquisition, and 4) competence knowledge usage. In competence identification, competences required (in the present or in the future) to carry out tasks, missions, and implementing strategies are defined. The identification can be done by using various techniques (e.g. interviews, goal oriented modeling, semantic annotation, and text mining). Competence assessment concerns evaluation of present state of specific competences as well as definition of the acquired level of specific competences. Competence acquisition includes an organization plans about how and when to acquire some competences. From competence assessment point of view, it is important that the identified competences are specific, definable, and measurable. Competence knowledge usage includes methods to use the knowledge and competences produced and transformed by identification,

assessment and acquisition processes. All main processes can be divided into sub-processes. (Berio & Harzallah 2006)

More detailed competence management process is presented in the figure 1. In this figure competence assessment is divided into four types of competences and competence acquisition is divided into four main methods.

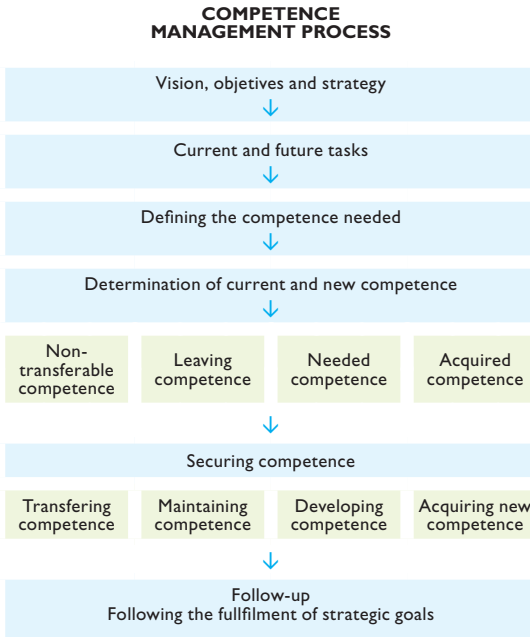


Figure 1. Competence management process.

The biggest weakness in the competence management is normally related to the time orientation. Competences are defined most often end up being backward-looking rather than future-oriented, forward-looking and proactive with respect to strategy and organizational change. (Vakola et al. 2007; Torrington et al. 2002). Competence models are also focused on what managers currently do rather than what is needed to perform effectively in the future (Antonacopoulou & Fitzgerald, 1996).

Competence Management Process in the ESLogC Project

The competence management process in the ESLogC project focused on the three first phases of the process: 1) competence identification, 2) competence assessment and 3) competence acquisition. The fourth phase, the competence knowledge usage, was included in development of logistics education. The other knowledge usage will be done especially in case organizations but also in other logistics centers in Southern Finland. The results are also exploitable in other logistics organizations.

Competence management in the ESLogC project was based on job-related competence identification in logistics centers in Southern Finland. The competence identification, assessment and acquisition were conducted on two levels. All three phases were studied first at the company level. Next the company level identifications, assessment results and competence development plans were summarized at the professional group level.

The competence management process in the ESLogC project is described below in figure 2.

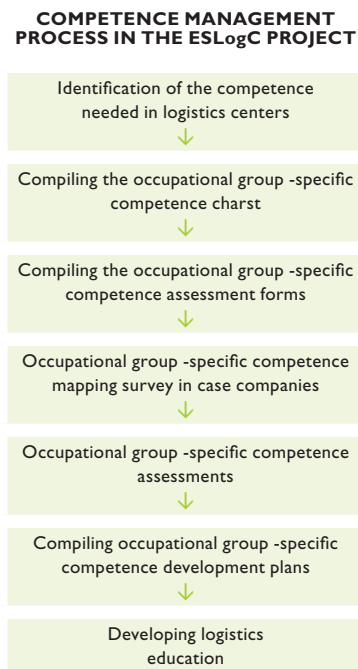


Figure 2. The competence management process in the ESLogC project.

Identifying the needed competence in logistics centers. The data of current skills and competence requirements was collected by using a Finnish adaptation of the Canadian DACUM (Developing A Curriculum) process introduced by Norton (1997) (see also SCID (Systematic Curriculum and Instructional Development from Norton & Moser, 2007). DACUM emphasizes the measurement of the application of knowledge to a given task. The key question within the method is what you can do instead of what you know.

Before the actual competence identification concerning logistics work tasks, logistics professionals considered the special features the future logistics centers possess and defined on a general level the competence demanded in the future logistics centers in the Forum 1 organized by the project.

Logistics work task and competence identification was executed by company-specific workshops with the assistance of certain facilitators. Logistics task identification was

done by 35 logistics centers from Southern Finland. The occupational groups under observation handled the actual logistics operations, such as logistics management and planning tasks, warehouse management tasks, warehouse tasks, purchasing, forwarding and transportation tasks and separate logistics expert, customer service, sales and marketing and support service tasks.

Compiling the competence charts. Altogether 120 company-specific occupational group competence charts were compiled on the basis of company-specific workshops. Afterwards, company-specific occupational group competence charts were combined as general occupational group competence charts that were completed with the logistics task competence areas reviewed from the literature and future competence demands. As a result, nine logistics occupational group competence charts based on the future competences were created: Logistics management and planning, warehouse superiors, warehouse workers, purchasers, forwarders, drivers, distributors, customer service and sales and support services.

Compiling the competence assessment forms. On the basis of the competence charts the project organization compiled the personal competence assessment forms. Additionally, company-specific occupational group competence matrixes and the guidelines for the execution of competence mapping survey and the utilization of the competence matrix were provided for the companies.

Competence mapping surveys. A future competence assessment survey that was based on the general occupational group competence assessment forms was executed in the case companies.

Competence assessments. Competence assessment survey results were analyzed with the spider web graph and the SWOT analysis. The analysis assessed the whole occupational group's competence with regard to the future competence demands and a single company's competence with relation to occupational group's general competence level.

Compiling the occupational group's competence development plans. Competence development plans included the case company-specific occupational group competence development plans and general occupational group competence development plans.

Other utilization of the results. Aside from the personal development plans, the results on the competence level from the competence mappings can be utilized in many different ways in the company's development and operations. With the help of competence mapping, the professional competence needed in different professions, tasks or processes can be described and assessed and thus analyze the changing development needs of the company. The competence map is also a great communications tool. It makes the work visible and familiar to the rest of the staff.

Management can utilize the competence charts and personal competence assessment forms for instance in the development discussions, personnel recruiting and introduction, personnel competence maintenance and when determining the personal fringe benefits.

The competence charts can be utilized in the cooperation between vocational schools and working life. For instance, curricula can be competence-based designed especially when making practical training and diploma work planning and work-life oriented execution clear and easy, aside with curricula assessment.

The results of the competence identification, assessment and acquisition sub processes are described in the following articles “Competence identification in Finnish logistics centers”, “Competence assessment in Finnish logistic centers” and “Competence acquisition in Finnish logistics centers”.

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COMPETENCE IDENTIFICATION IN FINNISH LOGISTICS CENTERS

The first stage of the ESLogC competence development sub-project concentrated on examining the future logistics competence demands. The project approached future competence as an entity that included organizational levels from top management to operational level. Competence mapping considered sustainable development competences in logistics processes and logistics operators' actions additionally to the traditional competence areas. The object there was to increase logistics operators' environmental competence and develop future competence in a more environmentally friendly direction.

Competence identification process of the ESLogC project included the following steps:

- The definition of future logistics center special features
- The determination of the needed general competence in future logistics centers
- The identification of occupational competence in logistics centers
- The compiling of occupational competence charts

These four steps and results from them are discussed in the following sub chapters. The profession group competence charts are presented in the Appendices at the end of this publication.

Future Logistics Center

The ESLogC project organized a Forum 1 – Future logistics center seminar where logistics experts and professionals from logistics organizations pondered the shape of the future logistics center. Workshop method produced future logistics center definitions that could be divided into six areas (not listed in order of importance): 1) Rational location, 2) competence network, 3) value adding services, 4) sustainable development, 5) space requirements and 6) intelligent technology

Rational location. Land use sensibility in the designing and building stage of logistics center was discussed when the experts talked about rational location. When deciding the location of the logistics center one must consider good traffic conditions: the closeness or the reasonable distance of harbors, airports and public transport. According to the workshop experts, the location should be in the vicinity of logistics flows of goods and potential customers.

Competence network. In context of competence network the experts in the workshops discussed especially the importance of the cooperation between different operators in the logistics center because the future logistics center consists of several different operators and relations and cooperation are intense. The multi-owner environment of the future logistics center supports the view of a vast competence and experience base in the logistics center that should be utilized. The discussion was drawn

to industry-specific data banks that logistics centers were perceived. The experts felt that future logistics centers are the centers of competence especially after the entry of technology centers and training. Logistics personnel's motivation and multi-skills that have been achieved through work experience or education are seen as important matters. Multi-skills bring flexibility and new opportunities to the work and operations.

The cooperation between logistic center operators with regard to personnel, systems and services was highlighted. Know-how and competence rotation was discussed as well. The workshop experts believed that the joint use of existing resources between operators will become more general at the local level the least. Personnel and the machinery needed in the work tasks could be rotated between different operators in the logistics center or define turns of usage locally between different operators. In another words, a pool of personnel resources, machinery and different services would be created to serve the entire logistics center.

Value adding services. Value adding services were seen as a developing area in future logistics centers. Logistics centers produce and sell added value to the customers through for example product upgrading and assembly. ICT was seen to be closely connected to value adding services. Future logistics center was seen to resemble more factory than warehouse. Highly refined services and products and the alteration of the products and logistics bring added value to the customer.

Sustainable development. In addition to environmental matters, sustainable development consists of supply chain quality and safety. A logistic center should be environmentally friendly and the logistics supply chains green. The price of energy and the climate pressures bring their own challenge to the matter. As practical solutions for enhancing sustainable development, the experts suggested that recycling should be optimized and energy savings created with automatic warehouse lighting and heating. Green logistics and ecology were seen as a competitive edge and image improving factor for the logistics center.

Space requirements. When considering the future logistics center's input infrastructure the properties and the premises were expected to be versatile, multi-faceted and energy efficient. The utilization of space available should be optimized when usage and loading factors would improve. The securing and improving of employment safety must be paid more attention to through premises: a functioning, clean and tidy working environment enhances work safety.

Intelligent technology. Several matters were raised in the discussion when the topic turned to intelligent technology in logistic centers. Generally speaking all experts agreed that technical solutions can enable effective operations. All in all, the logistics center could have an integrated artificially intelligent logistics system. Automation should function well and apply also in the altering situations. Up-to-date systems and their constant development are extremely important. It was said, that the processes in the future logistics center are flexible yet effective and directed by a back-end system. A possibility for a single, comprehensive information system utilization and development was also discussed.

Automatic warehousing was a vivid topic in the workshop. The experts believed that automatic warehousing, automated collection and automated palletizing are growing

in the future. Order sizes are getting smaller while the collection needs to be intensified by automation among other things. Instead of a single goods collection product and group collections are seen as more reasonable.

The entire logistical chain will use common product identifiers; the use of bar codes and RFID will be general. Communication from the producer all the way to the end customer and all operators in between must be secured through functioning system integration. This requires common standards and commitment from each operator.

Other thoughts. The other features the experts discussed and felt important concerning the future logistics center dealt with the planning of logistics center and customer orientation, networking and sustainable development. To begin with, when planning a logistics center, one should consider whether it will be manual, automated or both in correct proportion. And while the system solutions are being developed, one must consider that they not only fill the center users' own needs, but that the customer needs are also taken into account. It was acknowledged, that customer orientation demands for flexibility. The future logistics center functions around the clock and the production needs are anticipated effectively.

The experts thought that the logistics network and the trust between different operators are built for instance through common quality and safety systems. It was believed that the essence of safety and security will grow in the future. Logistic centers were expected to grow in size in the future, however to blend in better in the surrounding environment for instance by reduced noise and traffic jams. The role of public sector in the logistics projects in order to achieve common goals was also raised as an important topic in the future.

Competence Demands in the Future Logistics Center

Future competence demands was another matter the project crew wanted to discuss with the logistics experts. After two hours of workshop five main competence areas had been formed: 1) Competence Management, 2) Cooperation, 3) Supply Chain Management, 4) IT Operated Operations Measurement, Development, Follow-up and Assessment, 5) Operations Planning

Competence Management. Competence management itself is a rather large topic, and the experts' discussion focused on the 6 main topics that included work community skills, motivation, communication skills, project management, encouragement and the competence pressures caused by the legislation. Work community skills, motivation and encouragement are part of the employee well-being at workplace and are listed in the ESLogC project's competence charts in the interpersonal skills' section. According to the experts' beliefs, essential parts of a future organization are both internal and external communication skills. Business environment is changing more and more towards services and the processes must function flawlessly in different surroundings in order to maximize the competitiveness. Thus in the worst case scenario, the competitiveness can deteriorate if the internal or the external communication does not function properly. Changes in national and EU-wide legislation in the areas of import and export offer additional challenges as business environments have become more high-paced and more is done in project manner with products and ser-

vices tailored to customers' specific needs. Other things to consider related to competence management are the effects of multi-skills, orientation in the beginning of a practical training and to different competence areas, training and development plans as a part of motivation that concern language and IT skills, social skills development, and especially feedback from supervisors to employees and colleagues and vice versa.

Cooperation. Cooperation in the organization can be internal within the company's processes or external with different partners and customers. Both types of cooperation have challenges with openness and confidential information sharing that guarantee the success of both parties in productivity and profitability. Common customer projects in for example product development and Vendor Management Inventory take cooperation to a deeper level. Besides the previous, the experts pointed out that cooperation can enhance the sharing of good practices and their customization in the company's own operations. The essential factor in cooperation is the communication and interaction together with customer service spirit. Additionally, in international cooperation, the cultural factors must be acknowledged.

Supply Chain Management. Process control and understanding of one's own role in the supply chain were emphasized in Supply Chain Management competence area. When a process is grounded as a single entity where each function operates flexibly and according to common practice, efficiency and profitability are accomplished as a part of company strategy. In Supply Chain Management, process control, process familiarity and value creation as part of the process have a large effect on the controlled operations. When the operations are well controlled and one's own role is a clear part of the supply chain entity it is easier to anticipate one's own sphere of operations and possible functional or economical bottlenecks in the production chain.

IT Operated Operations Measurement, Development, Follow-up and Assessment. While technologies, practices and business environments are constantly changing, making operations more effective through IT operated functions is evermore current and longing for innovative anticipation according to the logistics megatrends. Possible bottlenecks of production should be anticipated with the help of quality systems that could be utilized with different reporting tools and indicators. IT competence must be brought up-to-date through training, orientation and mentoring in order to the maximum utilization of the IT systems and to prevent the false usage. By systematic measuring of operations, correct information can be gathered and used in development operations.

Operations Planning. The workshop participants included environmental consciousness, process planning, organization and warehouse layout planning into the Operations Planning competence area. The matters discussed concerning these competences were the visions, business assessment methods, the utilization of the enterprise resource planning systems and organization of work.

Job Based Competence Identification in Finnish Logistics Centers

The competence identification carried out in the ESLogC project was based on the concept of professional competence (Figure 1). A competent professional is in command of the work processes for which he/she is paid, using the methods, tools and materials available and observing occupational safety. He/she also has general working life skills and personal skills.

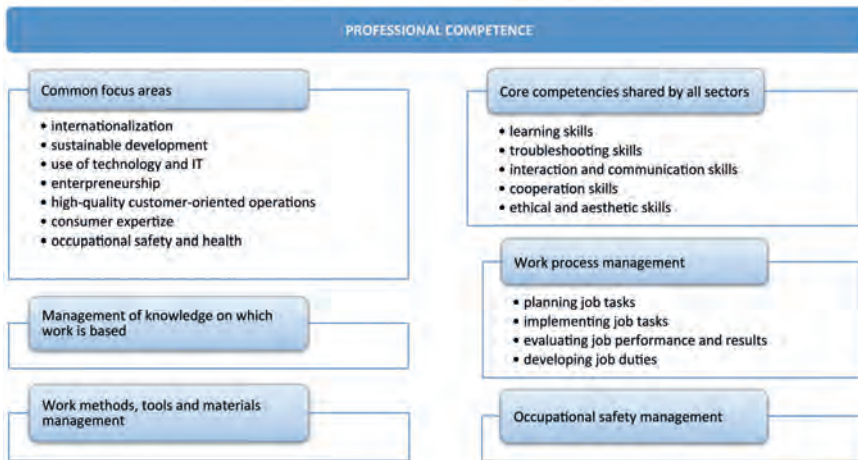


Figure 1. The concept of professional competence.

Competence identification was realized through a workshop with professionals from the logistics industry. Thirty five logistics centers from Southern Finland took part in the identification of logistics tasks. Case companies could decide on their own which occupational groups and participating employees they would include in the 2-4 task identification workshops organized at their premises. The occupational groups handled were logistics management and planning, warehouse supervisors, warehouse workers, purchasers, forwarders, drivers and different experts, customer service and sales personnel and support services.

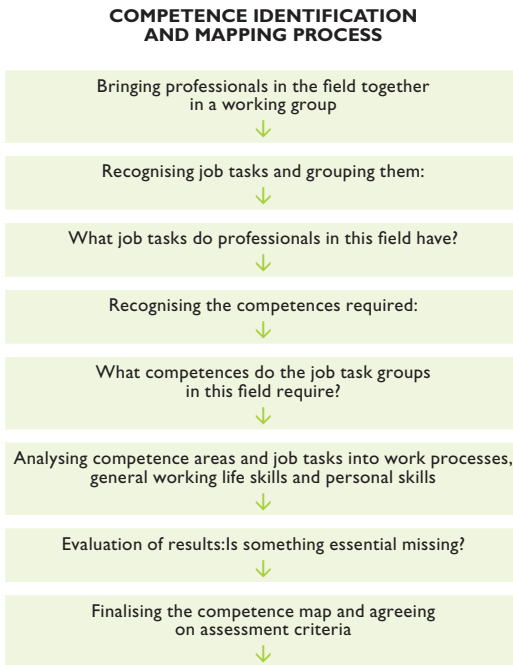


Figure 2. Competence identification and mapping process.

Competence identification was executed in the ESLogC project through grouping technique as following:

- In the beginning, each workshop participant listed one's own work tasks. On the next phase, each workshop member attaches his/her own work tasks to the wall.
- After this, the members organized the tasks related to each other into separate groups in silence. The object is to create work task entities from several single work tasks.
- The workshop group names each group through discussions.
- Facilitator collects the notes and compiles the competence chart.

Job Based Competence Charts

A competence chart (Table 1) is a single A4 sheet with a summary of competences. The first column contains competences relevant for the work processes of a particular profession, occupation, department or process, core skills common to all employees, and personal skills. The following columns specify the sets of tasks relevant to each general area of competence. There are on average 5 to 7 competence areas related to each work process, and there may be 3 to 8 job duties. General working life skills and personal skills are entered at the bottom of the competence map to round out the concept of comprehensive occupational competence.

Table 1. Basic structure of the competence map

Competence areas	1	2	3	4	5	6	
A	Has a competence relevant for the work process	Does something that can be evaluated	Does something that can be evaluated	Does something that can be evaluated	Does something that can be evaluated	Does something that can be evaluated	Does something that can be evaluated
B	Has a competence relevant for the work process	Does something that can be evaluated	Does something that can be evaluated	Does something that can be evaluated	Does something that can be evaluated	Does something that can be evaluated	Does something that can be evaluated
C	Has a competence ...	Does something ...	Does something ...	Does something ...	Does something ...	Does something ...	Does something ...
D	Has a competence ...	Does something ...	Does something ...	Does something ...	Does something ...	Does something ...	Does something ...
E	Has a competence ...	Does something ...	Does something ...	Does something ...	Does something ...	Does something ...	Does something ...
F	Has a competence ...	Does something ...	Does something ...	Does something ...	Does something ...	Does something ...	Does something ...
G	Demonstrates general working life skills	Is capable of interaction and communication	Is capable of cooperation	Is capable of troubleshooting	Is capable of learning	Acts ethically	Has aesthetic skills
H	Demonstrates personal skills	Demonstrates a quality and customer-oriented approach	Has international skills	Takes care of personal occupational safety and health	Follows the principles of sustainable development	Follows the principles of entrepreneurship	Uses technology and IT

In the ESLogC project, the skill and competence requirements were collected by workshops from 35 logistics centers operating in Southern Finland during the year 2010. The data consisted of 120 competence charts from different logisticians. Based on company and task specific information and literature review, we generated 8 combined profession group charts: Logistics management and planning, purchasers, warehouse supervisors, customer service and sales, supportive tasks (office, IT, administration), distribution and transportation, forwarders, and warehouse employees.

Work task specific competence areas were identified 2-6 per occupational group. The next paragraphs present the occupational group -specific competence areas from the seven largest occupational groups.

Logistics Management and Planning. Two task related competence areas were identified for logistics management and planning:

- A. Can develop logistics solutions according to company strategy
- B. Is able to plan, realize and follow quality control

Logistics management and planners take part in the strategy definition process and create the objects for their own responsibility areas according to the strategy. Quality control takes care of the product or service quality maintenance and the application of different quality indicators. Quality assessment is also a part of logistics management and planning team's tasks. Management takes part in the external and the internal quality audits. All in all, the constant improving of products and services requires

the comprehensive quality control's integration into all operations in the organization and that quality is seen as a necessary part of the strategic planning.

Warehouse Superiors. Warehouse superiors' occupational competence areas are:

- A. Can plan, realize and follow up on quality control
- B. Can plan, realize and follow up on developing storage operations
- C. Can foresee, plan and evaluate operations and take care of technical resourcing

Warehouse solutions have a major impact on supply chain management. Warehouse superiors ensure that the quality demands are being fulfilled and educate and guide the personnel on quality issues. The superiors must follow the stock levels that they do not get unreasonably large and on the other hand that deficits are avoided. Their tasks include also the cooperation with production, procurement and sales teams and the following of sales forecasts and future marketing promotions. The utilization of different inventory management method is one of the warehouse superiors' important tasks.

Warehouse Workers. The operative nature of workhouse workers tasks stood out in the warehouse workers' tasks:

- A. Knows duties connected to receiving goods,
- B. Knows duties connected to goods collection process
- C. Is able to support different work phases of the production process
- D. Is familiar with duties and systems involved in inventory management

Warehousing begins from the receiving of goods. The receiving process' mission is to clarify what has been received and to store the received goods properly. The inspection and the marking of exceptions is part of the goods receiving process. Collection of goods has a large meaning in warehouse working. The share of collection work in the total expenses of warehouse work is almost one half when the storage functions with collection principles. Warehouse workers support the production operations by moving goods between sections and delivering half finished goods and packing materials to production unit. They must also master different inventory management systems and equipment, such as bar codes, RFID, and voice control technologies that can enhance the operations.

Drivers. Six occupational competences were identified for drivers:

- A. Is safe driver and can foresee risks
- B. Knows the principles of safe transport
- C. Understands transporter liability
- D. Knows how to react in abnormal situations
- E. Is familiar with work duties in connection with terminal operations
- F. Understands transport regulations

Drivers foresee risks and avoid dangerous situations. They manage the principles of safe transportation such as the forces related to the load during the transport, the risk assessment of load movement and falling. The run-off control and the regulations concerning the transported goods are emphasized in the transport duties. The driver can

drive safely and economically according to the rules and regulations and knows how to act in abnormal situations.

Forwarders. Forwarders had four occupational competences in their competence charts:

- A. Can handle import deliveries
- B. Can handle export deliveries
- C. Can handle forwarding assignments
- D. Is able to verify advantages of clients

Forwarders take care that the goods are being delivered and received in terms of national and international laws, directives, regulations and contracts. Work tasks like the familiarity with documents such as Intrast, bill of lading and consignment notes. He/she can choose representatives and carriers for clients, plan transports and make necessary agreements.

Purchasers. Five different occupational tasks were identified for purchasers:

- A. Can carry out, evaluate and develop strategic purchasing policy
- B. Is able to maintain and develop delivery chain cost-effectively
- C. Is familiar with supplier markets and seeks out new suppliers
- D. Is able to carry out operative purchasing duties
- E. Has command of materials, products and services and is able to take care of product and storage control

A division for strategic and operative tasks is clearly visible in purchasers' competences. In the strategic tasks purchasing strategies are planned, compiled, assessed and developed. Whereas the operative tasks include the different phases of purchasing process from sending requests for quotations to invoice inspection, accepting and archiving. The purchaser must also follow the set objectives and their fulfillment and take care of reporting. The purchasing role should be developed in a way that more time would be left for strategic tasks such as acquaintance with the supplier markets and the search of new suppliers. In the future green purchasing and responsibility are an increasing trend. Global purchasing will increase the competence needs for purchasing personnel.

Customer Service and Sales. Customer service and sales representatives were identified with four competence areas:

- 1. Can forecast and control supply and demand and make pricing strategies and operation planning
- 2. Knows order-handling process and can tailor products to customer needs
- 3. Can price products and services and form sales, delivery and project agreements
- 4. Is familiar with sales, service and clientele management and after-sales operations

Customer service and sales representatives must follow the changes in the operational surroundings, the reports and statistics and can anticipate demand. He/She can plan

and segment the target groups and areas for sales. In customizations the customer's special needs' impacts on product flow and logistics are acknowledged. The tasks include the position as a link between the logistics and the customer and for instance inform the customer of the delivery schedule, and possible delays and special arrangements. In customer service and sales tasks market researches and marketing and sales are being studied, produced, planned and developed. An important task is to look after customer reclamations, clearing the reasons for the reclamations and take care of the reconstructive operations execution.

The professional group based competence charts of all profession groups are presented in the Appendix 1.

In addition to the original DACUM competence chart which includes two fixed and standardized columns, we found two new fixed competence areas for employees and four for managers. For employees these are (1) "Considers sustainability principles in his tasks" and (2) "Can sustain and promote customer and stakeholder relations". At the middle and senior management level, four new competence fields are: (1) "Considers sustainability principles in his tasks", (2) "Can sustain and promote customer and stakeholder relations", (3) "Can plan, control, assess, and develop the operations and capacities of the personnel in his own responsibility area", and (4) "Can plan, control, assess, and develop the operations and financial situation of the company unit".

Our workshops indicated that the logistics employees have a clear understanding about their current tasks and needed competences. Management and middle management tended to forget forecasting, strategic planning and implementation, employee leadership issues, and often also customer relationship management. Setting up business targets, using metrics and indicators, evaluating the results, and starting development projects were not clearly seen or remembered in several case companies.

The most important competences of all organizational levels included various logistics skills, such as material handling, warehousing, distribution, and purchasing. Beside logistics skills, interpersonal skills (general working-life skills), personal skills, sustainability, and relationship management were seen as general competences in all organizational levels. This is consistent with Mangan and Christopher's (2005) opinion that supply chain managers not only manage logistics but are also relationship managers. At the management level, also operations management, human resources development, and financial issues, especially economic performance, were highlighted. On the contrary, forecasting as well as strategic planning and implementation were not strongly indicated. On the other hand, in the charts of the logistics employees, the key finding was the importance of taking care of the customer relationships.

The transformation of businesses suggested in the literature is not clearly presented in practice. For example, customer-centricity, importance of information management and process approach instead of managing individual functions and presented in the Table 1 in the article "Process and methods of competence management and development" have to be considered in more depth. Future development issues were seen to include the environmental know-how, sustainable logistics, utilization of new information technologies, and project and risk management. These can be called modern logistics competences. The logistician should have multidimensional skills and competences.

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COMPETENCE ASSESSMENT IN FINNISH LOGISTICS CENTERS

In the second phase of the ESLogC project's competence development subproject, a competence assessment survey was implemented based on the competence charts presented in the previous article.

The competence assessment process of the ESLogC project included the following steps:

- creation of personal competence assessment form and competence matrix
- competence assessment survey
- competence assessment analysis

All three steps are described in detail in the following sub chapters. At the end of the article, the results from the competence assessment survey are shortly presented.

Personal Competence Assessment Form

Personal competence assessment forms were drawn up on the basis of the company and occupational group specific competence charts described in the previous article. Using this form, employees can evaluate their own competence and the supervisor can evaluate the employee's competence. Discussing these evaluations between supervisor and employee will result in a shared conception of the current level of competence and of competence needs.

Table 1. Example of the structure of a personal competence assessment form

PERSONAL COMPETENCE ASSESSMENT FORM				
Personnel group				
Department/Supervisors:				
Employee:				
Updated (date):				
Evaluation criteria/instructions				
novice, new a job	1			
advanced beginner	2			
competent	3			
proficient	4			
expert	5			
COMPETENCE AREAS	Own assessment of competence (1 - 5)	Supervisor's assessment of competence (1-5)	Joint assessment of competence (1-5)	Competence goal/requirement (3-5)
Competence area A				
Job duties, A1				
Job duties, A2				
etc.				
Competence area B				
Job duties, B1				
Job duties, B2				
etc.				

Competences are assessed through assessment of job duties. Occupational skill levels are used as assessment criteria for command of job duties related to work processes and for personal skills: novice, advanced beginner, competent, proficient and expert. The assessment criteria for command of job duties related to work processes and for personal skills are described in tables 2 and 3.

Table 2. Novice-to-Expert scale 1. (Dreyfus 1981; Dreyfus & Dreyfus 1984)

5	EXPERT No longer relies on rules, guidelines or maxims Intuitive grasp of situations based on deep tacit understanding Analytic approaches used only in novel situations or when problems occur Vision of what is possible
4	PROFICIENT Sees situations holistically rather than in terms of aspects Sees what is most important in a situation Perceives deviations from the normal pattern Decision-making less labored Uses maxims for guidance, whose meanings vary according to the situation
3	COMPETENT Coping with crowdedness Now sees actions at least partially in terms of longer-term goals Conscious, deliberate planning Standardised and routinised procedures
2	ADVANCED BEGINNER Guidelines for actions based on attributes or aspects Situational perception still limited All attributes and aspects are treated separately and given equal importance
1	NOVICE Rigid adherence to taught rules or plans Little situational perception No discretionary judgement

Differences between occupational skill levels can be defined based on knowledge, standard of work, autonomy, coping with complexity, and perception of context as presented in table 3.

Table 3. Novice-to-Expert scale 2. (Dreyfus 1981; Dreyfus & Dreyfus 1984)

	Knowledge	Standard work	Autonomy	Coping with complexity	Perception of context
Novice	Minimal, or 'text-book' knowledge without connecting it to practice	Unlikely to be satisfactory unless closely supervised	Needs close supervision or instruction	Little or no conception of dealing with complexity	Tends to see actions in isolation
Beginner	Working knowledge of key aspects of practice	Straightforward tasks likely to be completed to an acceptable standard	Able to achieve some steps using own judgement, but supervision needed for overall task	Appreciates complex situations but only able to achieve partial resolution	Sees actions as a series of steps
Competent	Good working and background knowledge of area of practice	Fit for purpose, though may lack refinement	Able to achieve most tasks using own judgement	Copes with complex situations through deliberate analysis and planning	Sees actions at least partly in terms of longer-term goals
Proficient	Depth of understanding of discipline and area of practice	Fully acceptable standard achieved routinely	Able to take full responsibility for own work (and that of others where applicable)	Deals with complex situations holistically, decision-making more confident	Sees overall 'picture' and how individual actions fit within it
Expert	Authoritative knowledge of discipline and deep tacit understanding across area of practice	Excellence achieved with relative ease	Able to take responsibility for going beyond existing standards and creating own interpretations	Holistic grasp of complex situations, moves between intuitive and analytical approaches with ease	Sees overall 'picture' and alternative approaches; vision of what may be possible

There is a separate set of criteria for general working life skills that establishes a shared understanding of what is being assessed. These assessment criteria are discussed in more detail in the Appendix 1.

In the ESLogC project company and occupational group specific personal competence assessment forms were drafted based on the company and occupational group specific competence charts, which can be used by the companies in their internal development.

The competence forms based on general occupational group specific competence requirements were used as a base to draft occupational group specific personal competence assessment forms, which were the basis for the implementation of a future competence assessment survey.

Competence Assessment Survey

The competence assessment survey was implemented as an Internet based Webropol survey in March and April 2011. Different occupational groups of the cooperation companies of the ESLogC project participated in the survey. There were 325 responses collected. The number of respondents within different occupational groups divided as in table 4.

Table 4. Respondents by professions.

Profession	n
Warehouse employees	186
Warehouses supervisors	58
Logistics management and planning	34
Forwarders	17
Purchasers	17
Customer service and sales	13

The competence assessment survey consisted of three sections: firstly, background information, then the section dealing with competence development methods and lastly the section handling actual competence areas. The sections handling background information and competence development methods were common to all occupational groups. The background information section asked for the respondent's company, occupational title, work experience and educational background. In the section handling the competence development methods, information was required on the methods used to develop competences and the interest towards different development methods within the last two years.

The section concerning competence areas was based on the occupational group specific competence forms drafted during the project and was therefore dissimilar for different occupational groups. The basic principle in the section concerning future competences was based on the previously described personal competence assessment form and the rating scale of work task management and personal readiness which is used in the competence assessment.

The personal competence assessment form consists of the competence area and work task columns which were evaluated subjectively on a scale from 1 to 5 or with a comment "is not included in my work tasks". The evaluation scale is defined as follows:

1. Can operate with guidance and use learned knowledge and skills
2. Can apply knowledge and skills but requires occasionally support and guidance
3. Can work independently, draft plans and evaluate what is important
4. Can use knowledge and skills in new situations and is able to develop operation
5. Can utilize objective information for developing and can teach/guide others

The competence assessment or definition of the competence target rate performed by the supervisor, which was presented in the basic model of personal competence assessment form, was not done in the ESLogC project.

Competence Matrix and Analysis

A competence matrix (Table 5) summarizes the results from the competence assessment survey. It enables one to see at a glance of what the competence levels are and to locate any competence gaps. The matrix also reveals if any particular expertise is only possessed by one employee.

Table 5. Example of a competence matrix.

Competence matrix Department X	Employee A			Employee B			Employee C		
	est.	target	diff.	est.	target	diff.	est.	target	diff.
Competence area A									
Job duties, A1			0			0			0
Job duties, A2			0			0			0
etc.			0			0			0
Competence area B									
Job duties, B1			0			0			0
Job duties, B2			0			0			0
etc.			0			0			0

A competence matrix was not drafted from the competence assessment survey in the ESLogC project. Instead the collected data was analyzed by using SPSS analytics software. By utilizing the SPSS analytics software the data indicated the company and occupational group specifically as percentage distribution and mean values. The occupational group specific results were cross-tabulated by background variables (work experience and educational background). Finally the data processed by using SPSS analytics software was transferred to an Excel template in which company specific figures of occupational group specific competences compared to the whole occupational group were drafted. Company specific competence analyses were drafted based on the figures.

In addition to competence area analyses the competence of each function was analyzed separately. The results from the competence assessment survey are presented below. The results are presented only from the six biggest respondent groups (logistics management and planning, warehouse supervisors, warehouse employees, forwarders, purchasers, and customer service and sales) due to low amount of responses from the other professions (distribution and transportation, and supportive tasks).

Logistics Management and Planners’ Competences by Competence Areas

According to the competence assessment survey the logistics management and planning competence levels by competence areas are in balance among competence levels three and four. Performance on level three reflects independent competence without guidance and level four knowing how to use knowledge and skills and develop in new situations. None of the competence areas are on levels one and two, so there is no

distinct lack in competence areas. In proportion, none of the respondents of logistics management and planning group possesses the highest competence level.

The strongest competence areas compose of tasks in the field evaluating personal skills and working life readiness. The weakest competence areas are in sustainable development and quality management.

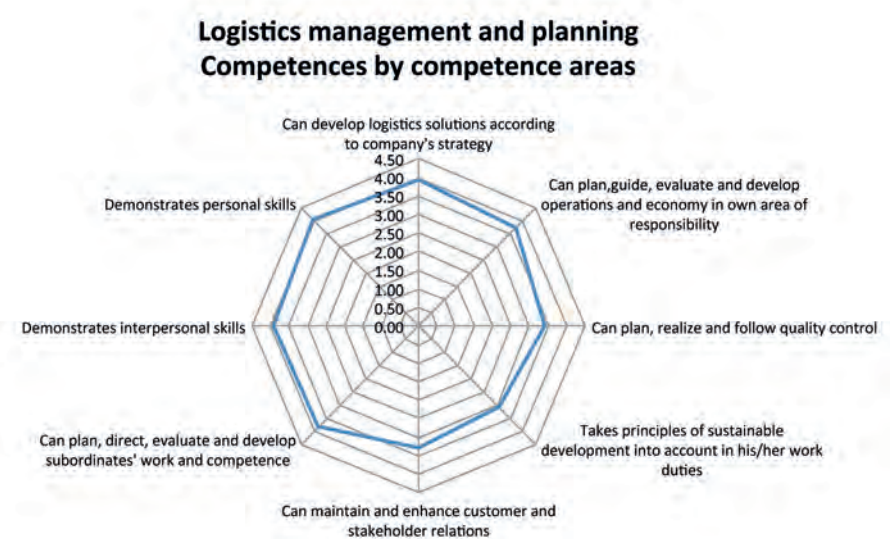


Figure 1. Competences by competence areas in logistics management and planning

Warehouse Supervisors' Competences by Competence Areas

According to the competence assessment survey the mean of the different competence areas of the warehouse supervisors is 3.35. On this level, the warehouse supervisors are expected to work independently and be able to draft plans. The responses of the responders from warehouse supervision differ in different competence areas from 2.96 to 3.73 (figure 2). The competence of warehouse supervisors is on a good level apart from perceiving the principles of sustainable development. Here were the least answers to the competence area of sustainable logistics. From this a conclusion can be drawn that either all the tasks in this competence area are not included in the work tasks of warehouse supervisors or that these work tasks are not perceived as own competence areas or own work tasks. The highest mean (3.73) of the competence areas of the warehouse supervisors is in personnel management. Thus, this competence area represents the supervisor's daily basic tasks such as employment issues, personnel resource planning, recruiting, orientation and competence management.

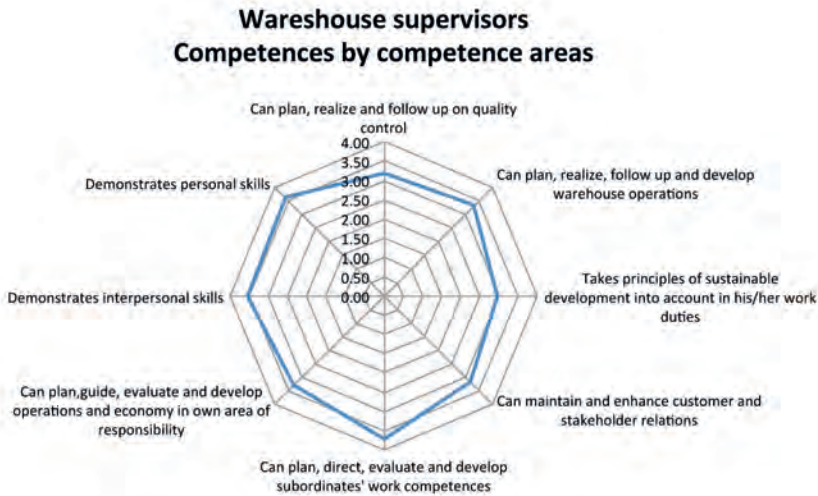


Figure 2. Competences by competence areas in warehouse supervision

Warehouse Workers' Competences by Competence Areas

According to the competence assessment survey the mean competence level of warehouse workers is 3.25. On this level the employee is capable of performing the given tasks. The warehouse workers evaluate goods collecting process (3.65), personal skills (3.56) and general working life skills (3.39) as their strongest competence areas. Warehouse workers evaluate maintaining and promoting customer and interest group relationships (2.87), supporting different stages of production process (2.88) and their competence in different tasks of delivery process (3.01) as their weakest competence areas. However, it must be noticed that the weaker the warehouse workers evaluate their competence level the greater is the amount of respondents that did not answer to the question. Based on the results 50% of the respondents do not perceive e.g. maintaining and promoting customer and interest group relationships as part of their work tasks (did not answer to the question on this competence area). 49.5% did not answer to questions concerning working tasks of delivery process while only 26.3% of the respondents did not answer to the questions on the highest mean value competence area.

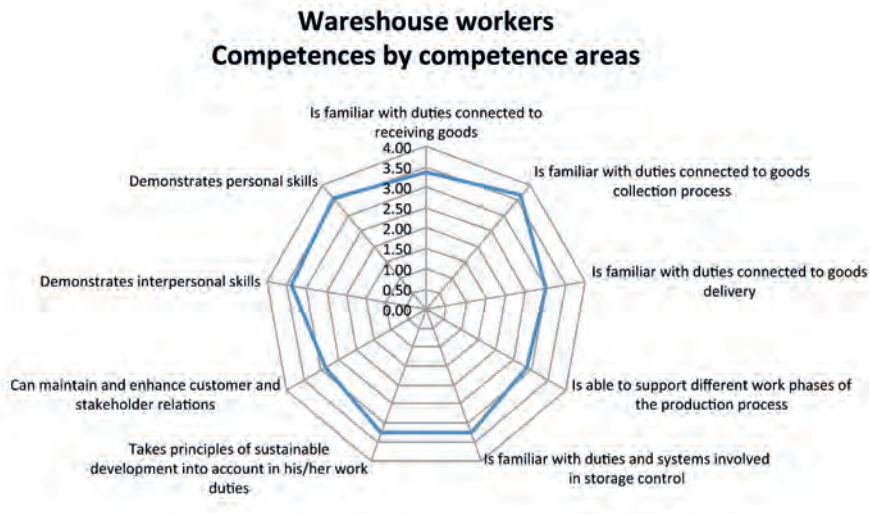


Figure 3. Warehouse workers' competences by competence areas

Forwarders' Competences by Competence Areas

Forwarders evaluated their competence on average to a mean level value 4.02. Only the principles of sustainable development are rated weaker than other competence areas but the competence is still on a competent level with a mean value of 3.33. Comprehensive generalization of forwarders' professional expertise cannot be made based on this summary because in many areas the competence is narrow. The results consist of responses of a small group and many of them perceived that tasks in question did not belong to the work tasks or otherwise could not evaluate their competence at all. Forwarders evaluated ensuring client's advantages (4.36) as their strongest competence area. Although also in this competence area half or more than half of the 17 respondents do not perceive these tasks as their own. This is surprising because ensuring client's advantages is one of the forwarder's main tasks. Only in a few of the questions of this competence area, the response rate was over 50%. In conclusion, it is possible to state that forwarders perceive their own competence to be on proficient level in those tasks that they perceive as their own. It is also possible to conclude from the results, that the work tasks that have not been answered do belong to the work tasks of each organization or the job descriptions among the respondents are highly individualized. According to the competence assessment survey forwarders' educational development requirements are in extending competence foundation. The suitable alternatives as development methods could be job rotation, mentoring and orientation.



Figure 4. Forwarders' competences by competence areas

Purchasers' Competences by Competence Areas

Purchasers perceive their competence to be at about level three, so purchasers can work independently, draft plans and evaluate what is important, thus perform their work tasks competently. The average mean value in the survey directed to purchasers was 3.37. According to the survey the strongest competence areas of purchasers are managing operative tasks (4.16), taking care of product and inventory management by utilizing product and service knowledge (3.79) and indicating general working life readiness (3.79). The weakest competence areas of the purchasers are according to the survey the planning, evaluating and developing of operations and finance (2.51). The competence related to strategic procurement policies (2.80) and the competence related to personnel development (2.65) were evaluated to a mean value less than three.

Purchasers Competences by competence areas



Figure 5. Purchasers' competences by competence areas

Customer Service and Sales Personnel's Competences by Competence Areas

In customer service and sales, the overall mean value of the competence level of competence areas is 3.98.

Figure 6 presents how the competence in different competence areas is divided relatively according to the responses of customer service and sales. Numerical values are counted from the mean values. The following factors are evaluated as competence strengths in customer service and sales: planning, developing, evaluating and guiding the personnel's performance and skills in their area of responsibility (3.99) and the competence in personal skills (3.86). The employees evaluate the competence in principles of sustainable development (2.77) and managing and predicting supply and demand and drafting pricing strategies and action plans (3.39) as the weakest competence areas. The weakest response rates are in the following competence areas: planning, guiding and evaluating the personnel's performance and skills (mean value 29.20%), perceiving sustainable development (mean value 40.80%) and managing order delivery process and product tailoring to a particular customer (mean value 44.2%). This reflects that these areas are not included in the tasks of all of the respondents. The respondents answered more actively to the questions concerning personal skills (mean value 97.80%) and questions concerning the competence in working life readiness (mean value 96.36%). This can be because the respondents felt that

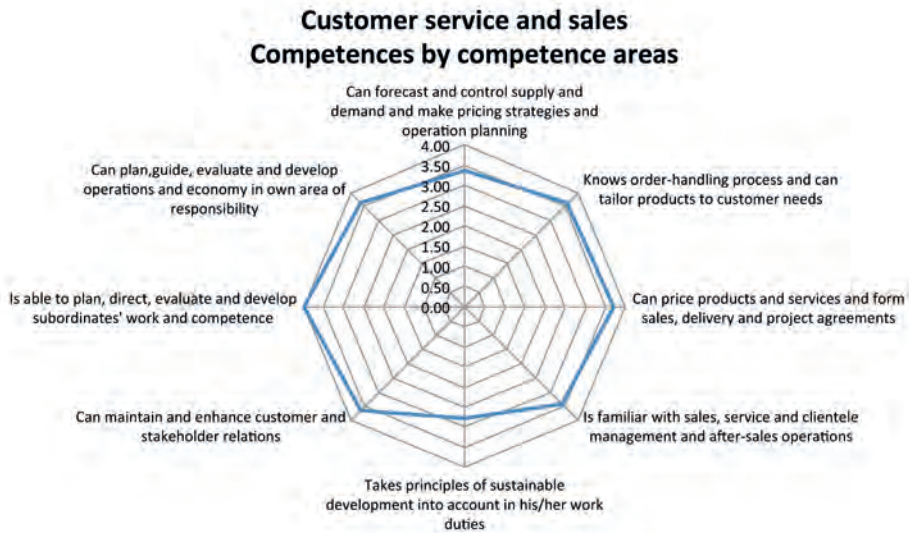


Figure 6. Competences by competence areas in customer service and sales

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Appendix I Assessment criteria for general working life skills

Interaction skills

1. I am able to engage in a functional, interactive relationship with different kinds of people as required by my job duties. I understand that interaction is an essential part of my own and the workplace community's productive activities.
2. My skill level is between 1 and 3.
3. I am able to manage various interaction situations such as negotiations naturally. I am able to see things from other people's points of view and accept alternative views. I am able to show empathy and sensitivity towards my co-workers and allow for differences between individuals.
4. My skill level is between 3 and 5.
5. I am able to engage even in difficult interaction situations and resolve them in a way that respects all parties involved. I am able to analyze demanding interaction situations and come up with suitable alternative solutions.
I encourage my co-workers by example to engage in open interaction.
- o. I do not yet have competence in this area.

Written communication

1. I am able to complete written assignments belonging to my job duties according to agreed practices. I am able to follow written instructions related to my job.
2. My skill level is between 1 and 3.
3. I am able to write documents related to my job in faultless language. I am fluent in writing text intended for diverse target groups, communication situations and media.
4. My skill level is between 3 and 5.
5. I am able to write demanding and interesting written materials related to my job, making use of various technical communications solutions. I am able to design and create material to support communications using a variety of tools.
- o. I do not yet have competence in this area.

Oral communication and presentations

1. I am able to express myself clearly and understandably in speech as required for my job duties. I understand the role of expressions, gestures and external appearance in communication.
2. My skill level is between 1 and 3.
3. I take diverse target groups and communication situations into account in my presentations. I am able to change my performance style according to the situation. I recognize means of non-verbal communication typical for myself.
4. My skill level is between 3 and 5.
5. I am able to give public presentations convincingly and with expertise. I am comfortable with performing. I am able to convey my message even under demanding conditions. I am able to strengthen my performance with

non-verbal means (e.g. suitable expressions and gestures) and know how to develop them.

- o. I do not yet have competence in this area.

IT skills in communication

1. I am able to use the computer software most commonly required in my job, at a basic level. I am able to find and convey information by computer, using e-mail and the Internet, etc.
2. My skill level is between 1 and 3.
3. I am able to use IT in my work in a variety of ways. I am fluent with the computer software I need in my job and can resolve the most common problem situations that arise with them.
4. My skill level is between 3 and 5.
5. I am able to help others with computer problems. I am able to improve my working practices making use of IT.
- o. I do not yet have competence in this area.

Cooperation skills

1. I know how to work together with other employees, customers and various interest groups, complying with the practices of the organization. I know our key partners and can contact them if necessary.
2. My skill level is between 1 and 3.
3. I am able to maintain and develop good relations with various partners. I am able to be constructive in teamwork and group work situations. I understand the importance of cooperation for coping at work.
4. My skill level is between 3 and 5.
5. I am able to recognize potential new partners and successfully create partnerships and networks. Working in a group, I make a positive contribution to the effectiveness of the group and the improvement of its work.
- o. I do not yet have competence in this area.

Troubleshooting skills

1. I cope with problems I face at work by following agreed instructions and the practices of my workplace community. I can and dare ask others for help in unclear situations.
2. My skill level is between 1 and 3.
3. In decision-making situations, I am able to compare a number of alternatives and choose the most suitable one. I am capable of independent troubleshooting and can remain calm even in demanding situations.
4. My skill level is between 3 and 5.
5. I am able to work flexibly and come up with new solutions in my job. I am able to anticipate and possibly prevent problems.
- o. I do not yet have competence in this area.

Learning skills

1. I take a positive attitude to learning and recognize my need to learn new things. I understand that my work and the operating environment are constantly changing and that my professional competence must be updated.
2. My skill level is between 1 and 3.
3. I am able to appraise my competences and development needs critically. I recognize and use the learning opportunities afforded by various stages in my life. I am able to develop ideas and try out new solutions in my own and my workplace community's working practices.
4. My skill level is between 3 and 5.
5. I am able to appraise information in my professional field critically and apply it diversely in my own work. I share my expertise with others. I encourage others in my workplace to take initiative, to improve themselves and to develop ideas and alternative solutions and operating models.
- o. I do not yet have competence in this area.

Ethical skills

1. I help my co-workers when needed. I abide by professional ethics, such as customer confidentiality, privacy protection and consumer protection legislation.
2. My skill level is between 1 and 3.
3. I know how to act responsibly, fairly and in accordance with agreements made. I am able to judge the impacts of my solutions and actions on my co-workers. I bring up community matters and regularly draw the attention of others to professional ethics.
4. My skill level is between 3 and 5.
5. I assess my own actions and those of my organization and submit development proposals for the attainment of jointly agreed values.
- o. I do not yet have competence in this area.

Esthetic skills

1. I dress neatly and appropriately for my work. I am considerate and keep my workstation and common spaces in order. My work is neat.
2. My skill level is between 1 and 3.
3. By my example, I help others realize the importance of aesthetic values in making the workplace comfortable. I aim to increase the aesthetic enjoyability of my workplace.
4. My skill level is between 3 and 5.
5. I am able to recognize ways of influencing the comfort of the organization and personnel as a whole. I am able to improve the external environment of the organization from both the customers' and the employees' point of view.
- o. I do not yet have competence in this area.

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COMPETENCE ACQUISITION IN FINNISH LOGISTICS CENTERS

The third phase of the ESLogC competence development sub-project consisted of the compilation of the competence development plans.

Competence acquisition process of the ESLogC project included following steps:

- 8 steps swot analysis
- company based competence development plans
- profession group based competence development plans.

The competence acquisition process including the 8 steps swot analysis is described in the first sub chapter. In the next sub chapters, we summarize the development needs of different profession groups and common competence areas of professions. In the end of the article, the recommendations for development methods are presented.

Competence Acquisition Process

Based on the competence analysis (and competence matrix), the personal competence development plans can be compiled in cooperation with the supervisors and the employees. Alongside with the personal competence development plans the company can construct a company, occupational group, department and process -specific competence development plans.

The ESLogC project produced company and occupational group specific competence development plans. The compiling of the plans was executed in workshops consisting of 3–6 persons by utilizing competence mapping survey's results, future competence demands and the 8-field swot -analysis.

On the basis of competence mapping survey and the future logistics center review the future opportunities and gains and the future threats and losses were defined. After this, a 4-field swot was compiled together with the company representatives. In the end, 4-field swot was completed as an 8-field swot and the occupational group competence development plans were constructed for six largest occupational groups.

Table 1. 8-field SWOT analysis

INTERNAL CURRENT	OPERATIONAL STRENGTHS	OPERATIONAL WEAKNESSES
	S = Strengths Competence strengths of the examined personnel	W = Weaknesses Competence weaknesses of the examined personnel
FUTURE EXTERNAL		
FUTURE OPPORTUNITIES	SUCCESS FACTORS	WEAKNESSES TO STRENGTHS
O = Opportunities What kind of competence is needed in the future in order to answer customer and stakeholder de- mands in a best possible manner?	S + O Success factors Opportunities into reality by reinforcing strengths Which matters must succeed in personnel competence develop- ment?	O + W Reacting to weaknesses through opportunities How personnel competence should be developed in order to turn weaknesses into strengths?
FUTURE THREATS	THREATS TO SUCCESS	CRISES
T = Threats The consequences of personnel incompetence, ob- stacles for optimal operations concerning custom- ers and stakeholder groups	S + T Reacting to threats through strengths How current strengths can help transfer personnel incompetence into competence?	W + T Crisis situations, weaknesses come to head, threats become reality What kind of crises can become true, if personnel competence is not developed?

The competence development plans are concise (two pages) summaries of the competence development emphases, development actions and crisis situations in which the company may fall in case the competence is not developed.

The next paragraphs compile each occupational group's competence development emphases, actions and possible crisis situations.

Competence Development Emphases and Actions for Logistics Management and Planning

When developing logistics management and planning personnel's competence, the success of the next factors must be followed carefully (top 10 development targets):

1. supply chain management and process development
2. operations' anticipation and vision creation; market alteration
3. partnership control and interface cooperation
4. quality control; methods, means, changes, reclamations
5. sustainable development
6. strategy and strategy-related matters' competence development
7. technology utilization; RFID
8. communication; international, competence, language skills, documents
9. international competence and operational preparedness
10. work well-being and personnel development; multi-skills

The success in the competence development requires the following actions to be fulfilled (TOP 10 development actions):

1. follow-up of the operating environment; markets
2. introduction of company strategy and explaining the objects to each organizational level
3. process identification, modeling and development
4. utilization of good practices and procedures
5. utilization of information and change management and competence management
6. improving the operative preparedness in the international cooperation and environment via language skills among other things
7. improving quality control through for instance reclamation process clarification and standards
8. acquiring the competence concerning the utilization of partner and service network
9. acknowledging and utilizing the factors concerning sustainable development and social responsibility
10. sharing the competence, know-how and silent information through orientation, mentoring and job circulation

Crisis situations if the competence is not developed. By leaving the competence undeveloped logistics management and planning personnel can run into the following crises:

1. supply chain entity becomes obscure
2. the unexpected changes in the operating environment, so called Ad hoc – situations can cause the disappearance of cooperation partners. Market situation, political situation and natural disasters need to be considered as well
3. competitiveness deteriorates
4. quality deteriorates noticeably
5. energy prices increase noticeably
6. operations become dysfunctional, for instance competence deficits, deficient language skills, inaccurate documents
7. resistance to change
8. labor scarcity, competence disappears
9. crisis caused by misunderstandings, different cultures are not understood, false defaults and incorrect decisions follow
10. neglecting sustainable development principles leads to the situation where the company no longer is good enough for the aware customer

→ customer relations break down and profitability decreases

Competence Development Emphases and Actions for Warehouse Superiors

Competence assessment survey cleared the following emphases for the warehouse superiors' competence development (TOP 10 development targets):

1. supply chain entity and process perception and strengthening
2. utilization of good local and global practices
3. sustainable development and social responsibility; life cycle thinking
4. customer oriented operations and the maintenance of the defined quality level
5. maintaining IT competence
6. succeeded recruiting
7. sharing the competence and silent information à multi skills
8. communication with internal and external stakeholders
9. maintaining and developing work well-being: identifying the silent signals for development needs and the humane success factors as competitive edge
10. age management

Success in competence development requires the following actions to be fulfilled (TOP 10 development actions):

1. comparing procedures and processes into good practices and utilizing them
2. widening quality control competence
3. foreseeing competence needs in operating environment changes; language skills, changing work tasks, multi skills
4. IT competence enhancement for operations rationalization and facilitation
5. taking sustainable development and social responsibility as part of processes and operating culture by concrete measures
6. identifying the competence needs in recruiting process and utilization of competence management tools
7. communications development as change resistance suppressor
8. increasing social skills and stakeholder cooperation; multiculturalism, utilization of silent knowledge as part of the development of weaker competence areas
9. well-planned and visible networking
10. stakeholder cooperation consolidation

Crisis situations if the competence is not developed. By leaving the competence undeveloped warehouse superiors can run into the following crises:

1. local optimization increases and business profitability declines
2. the functionality of the processes is not followed nor supported through technical solutions: operations become cost-inefficient
3. the decline of quality level
4. resistance to change
5. technology cannot be utilized and the inefficiency in operations leads to unprofitability

6. the company functions at a non-sustainable basis and loses customers
7. labor deficit and recruiting based on false competence do not answer to the demands
8. humane factors are underrated in the expense of work well-being and the competence and silent information disappear
9. competence is not managed, future demands are left unnoticed when the existing competence does not answer to the company's actual needs
10. a weakening in worker well-being and the resulting effect on profitability

Competence Development Emphases and Actions for Warehouse Workers

The emphases in the warehouse workers' competence development is on the following factors (TOP 10 development targets):

1. understanding the overall picture
2. updating and maintaining warehouse process
3. maintaining core competence and utilizing good practices
4. quality control and follow-up in the different stages of the process
5. sustainable development and social responsibility
6. stakeholder cooperation enforcement
7. utilizing technology and competence development
8. usage of systems, applications, equipment etc. as a matter of routine and as process supporting factor
9. sharing multi skills and silent information; procedures, competence strengthening
10. work well-being

The success in the competence development requires the following actions to be fulfilled (TOP 10 development actions):

1. understanding the overall picture and own role in the entity; orientation, job circulation
2. orientation in different areas of operating environment
3. process clarification; developing the familiarity with different stages of the process and products/ services/ documents. Utilization of the information inside the system
4. maintaining storage places and products' and services' basic information in the inventory management system
5. quality control
6. reacting to, anticipating and utilizing the sustainable development and social responsibility demands
7. technology and system training
8. competence (in working methods, systems, equipment, environmental matters etc.) development as constant operation, multi skills
9. work well-being maintenance, for instance trust and work safety
10. successful and carefully done recruiting

Crisis situations if the competence is not developed. By leaving the competence undeveloped warehouse workers can run into the following crises:

1. local optimization increases
2. quality crashes and affects profitability
3. stakeholder cooperation diminishes and productivity decreases
4. core competence disappears, skilllessness decreases the efficiency and competitiveness; know-how disappears, new technology and equipment cannot be utilized etc.
5. working environment deteriorates: work efficiency, productivity and profitability decrease

Competence Development Emphases and Actions for Forwarders

The success of the following competence development emphases for forwarders' occupational group should be carefully followed (TOP 10 development targets):

1. securing the interests of clients
2. stakeholder cooperation
3. globalization and international customers: import-export operations' strengthening
4. utilization and control of technical and electronic tools
5. strengthening multi-skills: job circulation, orientation
6. reviewing the principles of sustainable development
7. orientation of new personnel
8. investing in recruiting
9. investing in work well-being: development conversations, committing personnel
10. networking

The success in the competence development requires the following actions to be fulfilled (TOP 10 development actions):

1. organized mapping and updating of business environment
2. taking part in sustainable development of the business environment and business field
3. pricing training
4. training involved in legislation and customs changes
5. development of cooperation networks and stakeholder cooperation
6. assimilating sustainable development and social responsibility as part of forwarders' competence areas
7. sharing multi-skills and silent information
8. training in technologies and systems
9. maintaining and strengthening language skills
10. maintaining work well-being: encouraging in to applicable vocational training, development conversations, communication, social skills

Crisis situations if the competence is not developed. By leaving the competence undeveloped forwarders can run into the following crises:

1. localization grows and import/export diminishes
2. unexpected ad hoc situations that affect productivity
3. failure in pricing and transport planning and their effects on profitability
4. competence disappearing and losing know-how
5. labor deficit
6. decrease in work well-being

→ Customer relations falter and the productivity and profitability suffer.

Competence Development Emphases and Actions for Purchasers

The emphases in the purchasers' competence development are on the following factors (TOP 10 development targets):

1. understanding of the overall picture of supply chain and the impact of operative purchase operations on the entity
2. process and economic competence; cost efficiency in basic process control
3. product development cooperation; developing customer oriented products and services
4. customer and stakeholder competence
5. sustainable development; product development
6. utilizing technologies; IT training and mapping the opportunities of new systems and virtuality
7. cooperation
8. strategic personnel planning and competence management
9. observing future competence needs, competence recruiting or outsourcing and constant development of current personnel's competence
10. answering to silent signals and megatrends: sustainable development, safety, changes in legislation, globalization, multi-culturalism, language skills etc. Maintaining and developing purchasers' substance competence, developing multi-skills and encouraging to and creating a culture of open information sharing

The success in the competence development requires the following actions to be fulfilled (TOP 10 development actions):

1. strengthening strategic purchasing by job circulation, mentoring or training
2. training sessions involved in cost efficiency and financial management, mentoring or orientation
3. developing process competence (guidance, introduction and customization to customer, methods' easiness to use) and financial competence strengthening (fact sheets, seminars, training, guidance)
4. strengthening product development and stakeholder cooperation

5. utilizing and developing procedures and it systems; objects, indicators and rewarding from the reached goals
6. strengthening customer and stakeholder cooperation (networking and supplier cooperation)
7. enhancing and maintaining language skills and acknowledgement in cultural factors
8. competence sharing practices (master-journeyman working pairs)
9. developing negotiation skills and maintaining and developing supplier networks
10. developing working environment operations (included in each job description), creating systematic structures (meeting practices), usage of participatory methods, development projects and development and maintenance of competence management tools

Development targets are sociability and social skills that are essential to purchaser's competence areas. Purchaser often owns the responsibility in purchasing negotiations and stakeholder cooperation that demand good human knowledge, discretion and constructive approach to difficult situations. Master-journeyman -operations' and substitute-reserve -arrangements support and develop purchaser's competence for instance with silent information sharing.

Crisis situations if the competence is not developed. By leaving the competence undeveloped purchasers can run into the following crises:

1. increase in local optimization and its negative impact on business operations
2. changes in business environment causing profitability deficit and lost in competitiveness
3. increase in costs and unplanned financials deteriorate competitiveness
4. the meaning of sustainable development to business operations is not understood; customer losses and decrease in productivity
5. reclamation situations are not looked after, lack of constant improving of operations à constant improving of purchasing is not fulfilled
6. changes in legal and safety environment bring competence demands that reduce competitiveness and profitability (individual, communal and system competence)
7. competence deficit affects productivity and competent labor disappears: competence does not develop in time with strategy and customer needs, information outdated and silent information is not caught
8. management, HR or supervisors have no view on competence significance for business operations

Competence Development Emphases and Actions for Customer Service and Sales personnel

Competence development emphases for customer service and sales personnel are the following (TOP 10 development targets):

1. clientele control process
2. supply and demand process

3. perceiving supply chain entity and interface functionality
4. balance of pricing and costs
5. customer and stakeholder competence
6. utilizing sustainable development as competitive factor
7. utilizing technology
8. interaction
9. multi-skills
10. work well-being

The success in the competence development requires the following actions to be fulfilled (TOP 10 development actions):

1. foreseeing changes in supply and demand; stakeholder cooperation and training
2. training and other measures concerning market change follow-up and anticipation
3. strengthening project competence
4. training and mentoring of strategic and process competence
5. defining of sustainable development related matters and taking them as part of process; orientation, training, mentoring
6. strengthening stakeholder cooperation
7. IT training (new applications, maintenance of current applications)
8. strengthening networking
9. investing in recruiting, what kind of competence is currently needed
10. strengthening language skills by networking with the operators on the same target area, synergy advantage and language skills improvement through training

Crisis situations if the competence is not developed. By leaving the competence undeveloped customer service and sales personnel can run into the following crises:

1. demand changes that cannot be answered or reacted to, cause profitability deterioration and loss of competitiveness
2. growing local optimization and its negative impact to business operations
3. cost increase and unplanned financials deteriorate competitiveness
4. decrease in stakeholder cooperation causes deteriorating competitiveness
5. deteriorating competence affects productivity à customer satisfaction worsens
6. handling individual and personally customized service entities becomes difficult without sufficient language skills

Competence Development Measures and Methods for Logistics Centers

Competence is a constantly developing process. Competence development should happen constantly in all organizational levels: individual, team, unit and community

level including all organizational operations from working methods and process development to strategic development of the organization. Competence development should also happen throughout the organizational life cycle. It is essential to look after competence development during the stages of organizational changes.

There are several competence development methods that can be grouped many ways. Table 2 illustrates competence development methods that have been divided into five main categories: self-direction and active studying, work culture supporting development, expanding work tasks, guidance tasks and socially responsible operations.

Table 2. Competence development methods

SELF-DIRECTION AND ACTIVE STUDYING
› Learning files and work books
› Literature
› Vocational training
› Apprenticeship
› Further education
› Learning tours and learning from colleagues
WORK CULTURE SUPPORTING DEVELOPMENT
› Constant development of own duties
› Operations maintaining work ability
› Colloquiums
› Development plans
› Development conversations
› Competence mappings
EXPANDING WORK DUTIES
› Multi skills
› Development group participation
› Learning through projects
› Temporary posts and backupp systems
› Job circulation
GUIDANCE DUTIES
› Consultation
› Supervision of work
› Mentoring
› Tutoring
› Introcuton of duties
› Orientation
› Internal development
› Student guidance
› Consulting approach to work
› Dialogue and interaction
SOCIAL RESPONSIBILITY
› Teamwork
› Working in groups
› Areas and duties of responsibility

Methods can also be divided according to their original situations and formality and their target (individual-/organizational level)

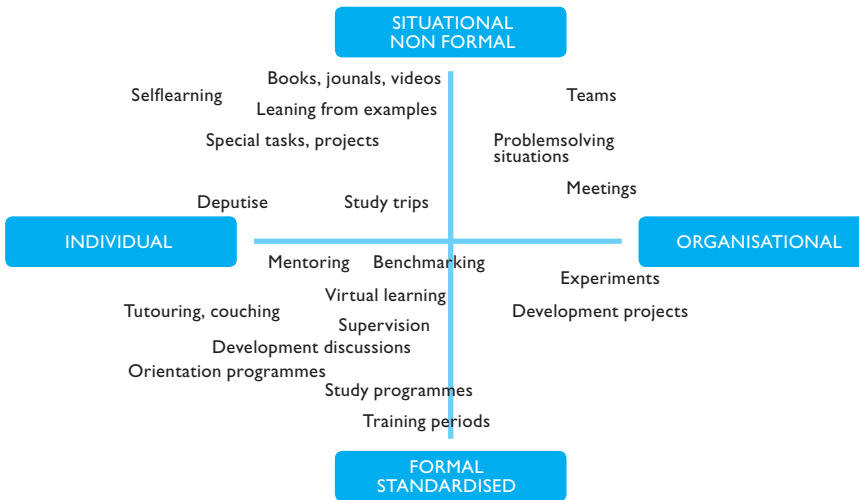


Figure 1. Competence development methods according to their starting point, formality and target.

As can be seen in table 2 and figure 1, the range in applicable development methods is wide. Certain methods are used constantly without acknowledging them as competence development methods. On the other hand, the usage of certain methods needs broader view and orientation to the method before they can be utilized. When choosing the methods, the organizational special features, business field changes and change rate and the impact of business strategy on the development method must be taken into consideration.

In competence management and while choosing the development method, it advisable to remember that 70% of learning happens through work-based learning, 20% through other people and only 10% through active studying.

Logistics business surroundings have changed greatly over recent years, thus competence development and increased appreciation for them should be invested in at all occupational groups in order to secure the competitiveness of logistics companies. Companies should encourage their employees to develop their competences and signal the appreciation for competence and commitment to competence development. Personnel should also be encouraged to maintain their preparedness to develop their own competence.

According to competence assessment survey results, the following competence development measures and methods should be used in personnel motivation enhancement: conference, trade fair and study trips, projects and ventures, feedback and development conversations and self-motivated training.

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COMPETENCE REQUIREMENTS CONCERNING SUSTAINABLE DEVELOPMENT IN FINNISH LOGISTICS CENTERS

-This Article has been published in the Corporate Social Responsibility Conference in Lahti 2012.

Introduction

In the field of logistics, like in other sectors of business and society, the role and importance of public pressure and stakeholder requirements concerning sustainable development and environmental issues have been growing significantly. Since companies and organizations are more and more obliged to minimize their environmental impacts, the same push has expanded to cover the whole supply chain – including all actions of logistics. This naturally creates new employee skill and competence requirements in different logistics functions.

The objective of this paper is to give an overview of the current and future skills and competence requirements related to environment and sustainability issues in various logistics tasks in logistics centers in Southern Finland. Based on the findings of this paper there is very often a significant gap between the current CSR and sustainability skills and competences and those required for future capability and success. As Yang et al. put it, the companies should understand core capabilities to fully exploit business opportunities and resist environmental threats (Yang et al., 2009). Lysons extends social responsibilities to suppliers and to the environment e.g. by an environmental management system (Lysons, 2000). When supply chain and environmental issues are considered it will be noticed that they have an impact on the entire operations supply chain (Waller, 2003). According to Ubeda et al., in turn, green practices in logistics can achieve both economic and environmental objectives. Integration of environmental management with ongoing operations has been a trend and has had an impact on numerous logistical decisions throughout the supply chain over the last several years. (Ubeda et al., 2011). In addition, Andersen et al. point out Bowen's

(2001) opinion that there is a gap between the desired supply chain sustainability in theory and the implementation of sustainability in supply chains in practice. Andersen et al. themselves think that only a limited number of multinational corporations “walk the talk” of CSR. They also point out that CSR and sustainability should be disseminated to all functional areas, subsidiaries abroad and offshore suppliers and to achieve this e.g. internal employee training and sharing of experiences as well as external, including formal and informal training of key personnel have to be done. (Andersen and Skjoett-Larsen, 2008). Björklund and Brodin agree by saying that CSR aspects are not taken as seriously as other business goals even though some efforts are taken (Björklund and Brodin, 2009).

The same was seen in our review. Even though corporate responsibility and sustainability issues are ranked relatively high in numbers of company values and missions it was implemented in operational level actions only to a very limited extent in the companies that participated in the research. If it can be assumed that the requirements for environmental and social responsibility in company actions grow in near future and that high environmental performance helps create competitive advantage on the market, it all should be taken into consideration also in employee training and education. In the short run employees seem to need training in various tasks related to sustainability and in the long run it would be important to include CSR issues in the professional education on all organizational levels of companies. Therefore, based on the literature and the findings of this survey, the paper aims at helping educational organizations to develop their curricula in a situation where sustainability and logistics are considered to create competitive advantage in competency in the near future.

Research Context and Methods

The purpose of this paper is to figure out how employees evaluate their own skills and competences related to sustainable development and CSR in logistics centers in Southern Finland and how they meet the future requirements concerning the same issue.

The collected data consists of ESLogC/wp3 research material. The empirical findings aim to figure out what kind of environmental requirements are set for employees working in the logistics’ field and how well the present skills and competences meet these requirements today. At the end, the paper takes a quick look at how employees would like to enhance their own competences.

The findings of this paper are based on reviewing the research and development project ESLogC / wp3 (www.eslogc.fi) funded by the European Regional Development Fund, Southern Finnish municipalities and companies. Paper’s empirical data was collected by using the Finnish adaptation of the Canadian DACUM (Developing A Curriculum) technique between January 2010 and September 2011. The inquiry related to this paper was drawn according to the professional competency charts and future competency needs used in the ESLogC / wp3 study. The data collection was made in cooperation with the employees working on different organizational levels in the project’s co-operation companies within this project (n = 35) which have their own logistics operations in Southern Finland. After this the future task requirements on all three organizational levels were added based on recommendations of authorities e.g. VTT and TEKES’s research (2007) concerning future megatrends. Employees

of the participating companies in the study were asked to evaluate their own skills and competences concerning the given competences and task areas. The main analyzed profession groups determined by EK (Confederation of Finnish Industries) were management and planning of logistics, warehouse workers, warehouse supervisors, purchasers and forwarders. Since sustainability issues were only one of the competence sectors in the survey, the number of questions had to be limited. Therefore a lot of interesting details and information remained unrevealed. For the same reason the comparison between company values and environmental policy on the one hand as well as company structure and individual answers on the other were not done in this phase. They will be studied in more detail in the next phase of the research.

Empirical Findings

As explained earlier, the employees were asked to evaluate their own skills and competences concerning the given task areas. The task areas depended on the profession group and consisted of several more detailed questions based on the professions' competence charts. One of the task areas was related to sustainable development with the title "Competence in Sustainable Development". Under this title there were more detailed questions which were made separately for each profession group. Since it was not known in advance how different sustainability matters and tasks were organized and delegated in the participating companies, the questionnaires were targeted to profession groups selected by collaborative organizations themselves.

The questionnaire's answer scale was 1-5. Empty answers meant that the task is not included among answerer's duties. The explanations for the whole scale can be seen below:

1. can follow instructions and use gained knowledge and skills
2. can apply knowledge and skills but needs support and guidance occasionally
3. can work independently, plan and evaluate what is important
4. can utilize knowledge and skills in new situations and can develop actions and functions
5. can utilize objective information for development and guide others.

Level 3 was regarded as sufficient competence.

According to the ESLogC/wp3 empirical research, the biggest challenge concerning sustainability and environmental issues seemed to be the big proportion of "empty answers" which was determined as "does not belong to my duties". This could be interpreted as the given tasks not being seen as a part of daily work. Generally speaking, the findings revealed that these skills and competences were, in most cases, the weakest of all competence areas included in the inquiry. This can partly be explained by the amount of "empty answers" but there were also quite a lot of cases where the skills were evaluated as relatively weak. The average evaluations of individual profession groups are described in more detail in the following chart and in enclosure 1.

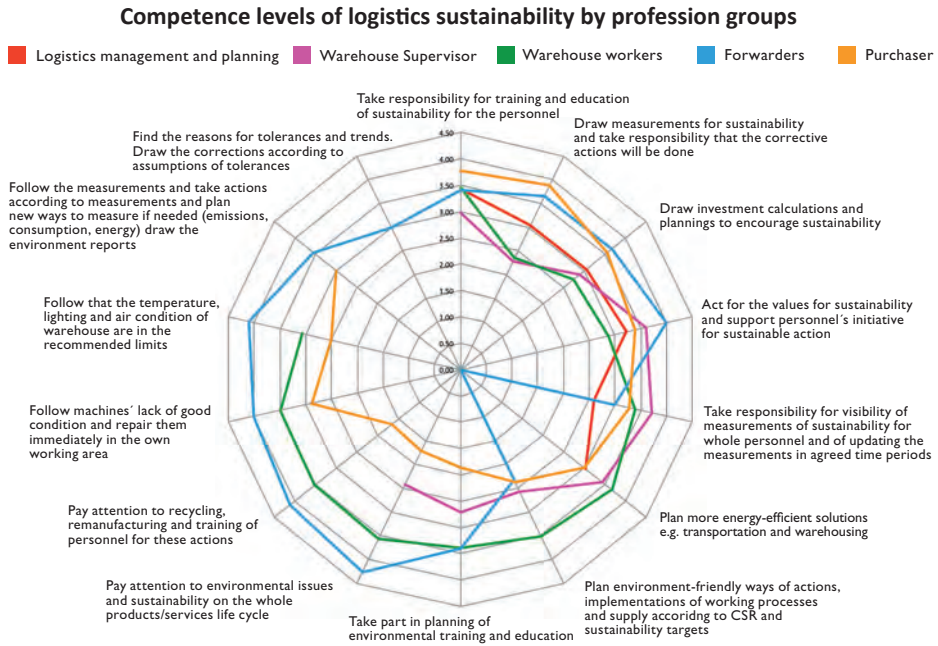


Figure 1: Competence levels of logistics sustainability by profession groups

Logistics Management and Planning

Sustainability issues were the weakest competence area of all eight research inquiry areas. Within the logistics management and planning's sustainability section there were six detailed tasks. The option "does not belong to my duties" was selected by 21-41% of the participants depending on the individual task. Those who saw that these tasks do belong to their work mostly evaluated their own competence with the grade either 3 or 4. The average grade within the sustainability sector was 3.09. The best average grade (3.44) was related to organizing environmental education and training for employees even though 26% of participants did not include this in their own work. Acting in line with sustainability values and supporting employees' initiatives related to sustainable development was also graded relatively high, 3.22. Only 21% of participants claimed that it does not belong to their duties. Only environmental measuring was graded under 3 and was clearly not too often included in the duties of logistics management and planning: only 51% of participants seem to deal with it. It is very well possible that these kinds of tasks are delegated to someone else in the participating companies but because of the chosen research method there was no chance at this point to find out how these issues are organized in them. Even though these acts could be delegated, the question raises as to how come these actions of sustainability are poor and not implemented in logistics management and planning work tasks. If logistics management and planning does not take care of e.g. environmental measurements and calculations related to logistics, training and education of employees in environmental matters or energy efficiency in different logistics functions, who does? Since sustainability was only one of the competence areas in the ESLogC/wp3

research, it remained unrevealed whether the company has recently started to coordinate these issues or if the management had made the decision that they are not relevant to the company. Sustainability and CSR should be recognized and considered by logistics management and planning as it affects the company's cost, profitability, competitiveness and finally stakeholder's profits.

Purchasers

Skills and competences concerning the environmental matters were evaluated to be among the three weakest (average grade 2.93) competence areas together with economic issues (2.51) and strategic purchasing (2.84). Within the sustainability sector there were 13 detailed tasks. Among purchasers, the option "does not belong to my duties" was commonly used. Reporting environmental issues was not included in the duties of 65% of the participants which is understandable if the reporting has been outsourced or done by, for example, the communication department. Most of those who opined that environmental reporting does belong to their duties graded their own competence very low, the average grade being 1.67. Investment calculations or plans related to sustainability issues were not done by 59% of the participants. Those who did graded their own competence relatively low: average grade 1.71. This is not necessarily surprising but more surprising instead is that the same percentage does not audit their supply chains from ethical or environmental viewpoints and that 53% of the participants saw that setting ethical environmental purchasing criteria for suppliers environmental education and training as well as finding alternative ways of action related to sustainability issues do not belong to their duties. All these activities gained relatively low average grades: 1.88 - 2.50 except setting ethical and environmental purchasing criteria where most of the participants gave the grade 4,00 on average, being as high as 3.88 which was actually the highest grade of all. Those who included ethical and environmental auditing in their duties graded their own competence lower than in setting requirements: 3 on average. The biggest number of answers was given for the task "Acts in line with the environmental goals of the company and the supply chain" 76 %, the average grade being 3.77, the second best. The overall average within sustainability sector was 2.93.

Skills and competences of purchasers were clearly related to their educational background. The best results in the whole enquiry were achieved by the person graduated from a university of applied sciences, average grade 3.2. The second best results (average grade 2.9) were gained by the ones graduated from Polytechnic or further education and the third were university graduates (2.13). The participants whose educational background was vocational school or "other" had the weakest average grades, 1.87 and 0.23.

Warehouse Supervisors

Warehouse supervisors had nine detailed questions on sustainability. In general, skills and competences related to sustainability issues were evaluated to be the weakest of all task areas, the average degree was 2.96. Three out of nine tasks reached an average grade above 3. Those were tasks concerning maintenance of machinery (3.72), waste management (3.61) as well as heating, lighting and air conditioning (3.44). The same

three tasks also received high numbers of answers. Only 9-17% of the participants did not include them into their duties. All other six tasks got quite a lot of “does not belong to my duties” -answers: 34-45% depending on the individual task. The weakest average grades were given for participation in environmental training and environmental programmes (2.28) and participation in environmental projects (2.42). Educational background did not seem to have influence on the given grades.

Warehouse Workers

Many profession groups in this survey evaluated their skills and competences concerning environmental issues being relatively low compared to other task areas. Warehouse workers were an exception. Out of nine task areas, sustainability was the fifth best with the average grade of 3.23. It is interesting to see that the grade is higher than that of their supervisors, logistics management and purchasers. On the other hand however, the most surprising details in results could be that 60% of the participants do not see that participating in environmental training would belong to their duties or the fact that avoiding one-way or single-packed products received the second weakest average grade, 2.72, and above all, this avoidance of one-way or single-packed products does not belong to the duties of almost the half of the participants. A good question might be whether it really is a question of skills and competences here or attitudes. Tasks that were best seen as a part of daily work were acting in line with company environmental goals, safe use of machinery and equipment as well as waste management. Evaluated by the average grade, warehouse workers were at their best in safe use of machinery and equipment (2.65), maintenance of machinery (3.56) as well as waste management, avoiding unnecessary use of engines and appropriate disposal of defective products and equipment (all three 3.5). The sustainability sector consisted of altogether twelve detailed tasks.

Forwarders

In terms of environmental skills and competences, the profession group of forwarders was interesting. Though 71% of the participants see that they act in line with the environmental goals of their company, 53-100% of the participants say that the given tasks do not belong to their duties. It would be very interesting to know what does then. The only exceptions here were use of online communication tools (65% use them) and sorting of waste (59% do). According to the survey, nobody prefers environmentally friendly packaging and distribution channels. Is it because forwarders cannot influence the choices related to distribution channels, routing, packaging or procurement, or are environmental qualities completely excluded from the choice criteria or how can this be explained? However, those who saw environmental issues as a part of their daily work evaluated their own skills and competences in this sector rather high, 3.7 on average. The strengths in this sector were use of online communication tools (4.27), energy efficient and economic use of devices (4.13) and sorting of waste (4.1) - even though more than half of the participants did not include energy efficient and economic use of devices among their duties. The weaknesses in addition to preferring environmentally friendly packaging and distribution channels mentioned before can be found in participation in environmental education and training (2.33) as well as taking environmental issues into account in routing (2.5). The latter is quite

a pity because, as is well known, the environmental impacts of transport are significant and in addition environmentally friendlier routing is often also more economical. All in all, the sustainability section was again the weakest task area compared to the other task areas.

Education and Training During the Career

The gap between lacking competences and new requirements can best be covered by means of training and education. Andersen et al. (2009) suggest that in order to enhance employee environmental competence, e.g. internal employee training and sharing of experiences as well as external - including formal and informal - training of key personnel is needed. Cottrill (2012) and Slone et al (2010) agree by saying that it is important in a supply chain to provide employees with opportunities to learn new skills, widen their competence and thus enhance their professional qualifications by taking advantage of educational opportunities. How would the employees like to utilize this advantage then? In the inquiry, the employees were asked which kinds of training or education forms have been used to support their skills and competences and which of them they would like to use in the future. The most popular alternatives varied to some extent among the profession groups, but in general, conferences, seminars and fairs were mentioned by all profession groups, either as the first or the second choice. The results can be seen in the table below:

Table 1: The most favored forms of training and education

The most favoured forms of training and education	%
Logistics Management and Planning	
company visits or excursions	22
trainee and graduate programmes	22
conferences, seminars, fairs	16
Warehouse Supervisors	
conferences, seminars, fairs	18
feedback and development discussions	16
projects	14
Warehouse Workers	
feedback and development discussions	49
conferences, seminars, fairs	31
formal education	25
systematic job rotation	25
Purchasers	
conferences, seminars, fairs	53
external education by own choice	41
projects	24
Forwarders	
feedback and development discussions	21
conferences, seminars, fairs	19
projects	10

Referring to the above table it could be concluded that employees in this inquiry appreciated in-company training far more than external training. The best choices varied to some extent but what is common to almost all choices is that they can be organized by the company itself. On the other hand however, it was seen in the previous chapters that quite a big proportion of employees did not see participation in environmental training to be their duty.

All in all, as can be seen above, skills and competences related to sustainable development and CSR were the weakest sector of all competence sectors in almost all profession groups included in the survey. In addition, practical tasks concerning this competence sector were often not seen as a part of the daily work of the participating employees at all. However 22 out of the 35 participating companies (=60%) have CSR-related information on their public web pages. The thoroughness and contents depend of course on the company but in most cases, companies tell about their environmental and social values on their pages. They publicize their environmental policy and various goals they want to achieve in the field of CSR etc. in order to convince the reader about their social responsibility and environmental performance. Of course, CSR issues can be managed by a separate CSR department or be delegated elsewhere in the company but as claimed by many researchers, in order to be effective, CSR matters must be integrated in all actions and on all organizational levels in companies. (e.g. Pedersen & Neergaard 2008, Porter & Kramer 2006, Husted & Salazar 2006). But the findings of this survey support the observation of Björklund et al (2009) that, so far, CSR aspects are perhaps not taken as seriously as other business goals in the participating companies. In other words, it could be claimed that the companies involved in the survey do not yet “walk their talk” in an efficient way. A lot of time and effort may be wasted if the CSR strategies, policies and targets are not integrated into action or implemented in everyday work. At the same time, companies might lose a possibility for potential competitive advantage in the market.

Discussion and Conclusions

As pointed out earlier, CSR issues e.g. environmental performance will be regarded as a considerable necessity in organizations in the near future, which sets certain requirements for the knowledge, skills and competences of employees too. The aim of this paper was to figure out how employees in logistics centers in Southern Finland see their own competences in relation to environmental matters. It turned out that the findings of the survey described in this paper supported e.g. Bowen's claim (in Andersen et al. 2009) that there is a gap between the desired supply chain sustainability in theory and the implementation of sustainability in supply chains in practice. Even if CSR matters and sustainability should be integrated in all functions in companies, it was quite common that various practical tasks given in the inquiry were not included in the responsibilities of the participating employees or if they were, the employees evaluated their own skills and competences in most cases to be weaker than in other competence areas.

Based on the existing literature and the findings of this paper, it can be concluded that sustainability matters and environmental issues must be included in the training and education of both present and future employees. In the short term, company internal training - especially conferences, seminars and fairs - seemed to be the most popu-

lar choice among the given alternatives. In the long term, companies need to recruit skilled and motivated personnel. Therefore it is of utmost importance that sustainability and CSR issues are included in all education.

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Appendix I: Sustainability competences by profession group

Enclosure I: Sustainability competences by profession group	
Logistics Management and Planning	Competence of sustainability included in the working tasks
	Take responsibility for training and education of sustainability for the personnel
	Draw measurements for sustainability and take responsibility that the corrective actions will be done
	Draw investment calculations and plannings to encourage sustainability
	Act for the values for sustainability and support personnel's initiative for sustainable action
	Take responsibility for visibility of measurements of sustainability for whole personnel and of updating the measurements in agreed time periods
	Plan more energy-efficient solutions e.g. transportation and warehousing
	Competence of sustainability included in the working tasks
	Plan environment-friendly ways of actions, implementations of working processes and supply according to CSR and sustainability targets
	Take part in planning of environmental training and education
Warehouse Supervisor	Pay attention to environmental issues and sustainability on the whole products/services life cycle
	Pay attention to recycling, remanufacturing and training of personnel for these actions
	Follow machines' lack of good condition and repair them immediately in the own working area
	Follow that the temperature, lighting and air condition of warehouse are in the recommended limits
	Follow the measurements and take actions according to measurements and plan new ways to measure if needed (emissions, consumption, energy) draw the environment reports
	Find the reasons for tolerances and trends. Draw the corrections according to assumptions of tolerances
	Take part in CSR and sustainability projects
	Competence of sustainability included in the working tasks
	Act as defined by company's CSR and sustainability targets
	Take part in environmental and sustainability training
Warehouse workers	Avoid single packing and disposable supplies
	Use online - tools on reporting information
	Use machines and devices energy-efficiently and economically
	Use machines safe both in and outside of warehouse
	Avoid unnecessary driving and moving by working machines
	Take care of the condition of machines
	Repair machines
	Take care of recycling and remanufacturing
	Dispose machines properly
	Look for sustainable variable actions and procedures
Forwarders	Competence of sustainability included in the working tasks
	Act as defined by the company's CSR and sustainability targets
	Pay attention to sustainability in procurement
	Pay attention to sustainability in routing
	Draw optimal inbound and outbound freight
	Organise training and education in CSR and sustainability
	Use if possible environmental friendly packing, transportation and distribution channel
	Take part in environmental and sustainability training
	Avoid single packing and disposable supplies
	Use online - tools on reporting information
Use machines and devices energy-efficiently and economically	
Purchasers	Repair machines
	Take care of recycling and remanufacturing
	Dispose machines properly
	Look for sustainable variable actions and procedures
	Competence of sustainability included in the working tasks
	Follow the company's CSR and sustainability targets in purchasing and supply chain management
	Set ethical and environmental purchasing criteria for suppliers
	Pay attention to sustainability of product's entire life cycle
	Make local procurement
	Make joint ventures
Audit the supply chain and its ethical and environmental perspective	
Take responsibility for sustainability training and education for the personnel	
Take part in environmental and sustainability training	
Draw investment calculations and planning to encourage sustainability	
Draw and report of environmental report for internal and external customers	
Uses if possible environmental friendly packing, transportation and distribution channel	
Look for sustainable variable actions and procedures	
Use devices energy-efficiently and economically	

PART II: LOGISTICS EDUCATION IN FINLAND

Soili Kela

DEMAND FOR SKILLED LABOR IN FINNISH LOGISTICS CENTERS

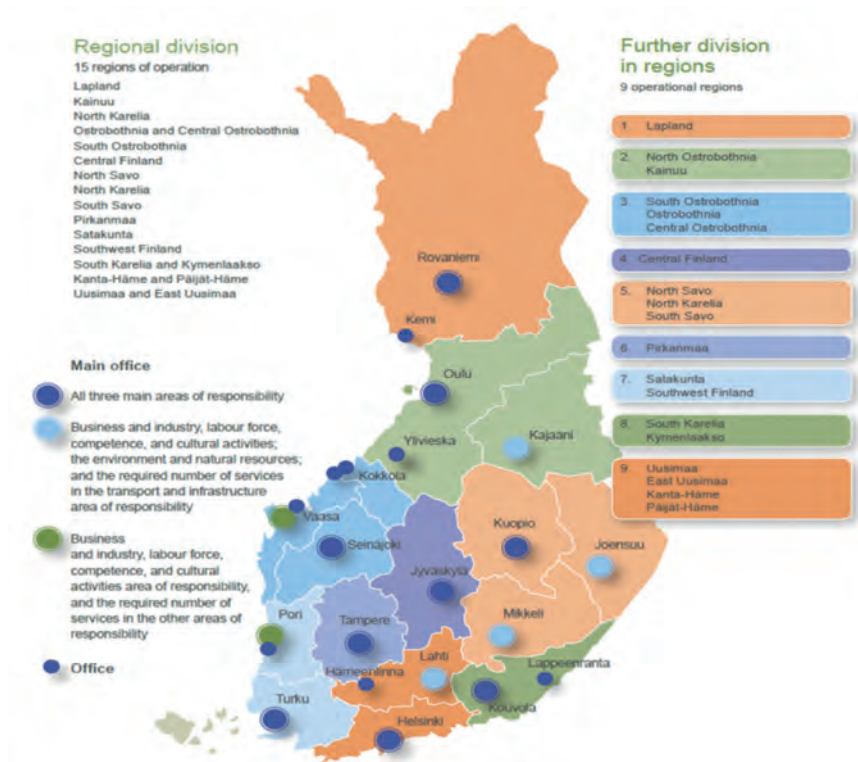
The ESLogC project implemented three surveys on the future workforce and training requirements of the logistics industry. These surveys were carried out electronically and through personal interviews. The surveys were executed during spring 2010 (to the Centers for Economic Development, Transport and the Environment in Southern Finland), winter 2010-2011 (to the cooperation companies of the ESLogC project) and summer 2011 (to the employment agency firms in Southern Finland). These surveys were carried out by the project researcher Suvi Sivén (LUAS), student Piia Leivo (Laurea), who made her Thesis on the topic, and the project assistant Soili Kela (Laurea).

Center for Economic Development, Transport and the Environment

The Centers for Economic Development, Transport and the Environment manage the regional implementation and development tasks of the state administration. There are 15 Centers for Economic Development, Transport and the Environment in Finland (Picture 1). These centers focus on promoting regional competitiveness, well-being and sustainable development, as well as mitigating climate change. The Centers for Economic Development, Transport and the Environment also promote the development of good living environment and community structure while supporting citizens' well-being and the competitiveness of trade and industry in their respective regions.

The Centers for Economic Development, Transport and the Environment have three areas of responsibility:

- 1) Business and industry, the labor force, competence and cultural activities
- 2) Transport and infrastructure
- 3) The environment and natural resources



Picture 1: Centers for Economic Development, Transport and the Environment in Finland (ELY-keskus, 2012)

Centers for Economic Development, Transport and the Environment operate within the administrative sector of the Ministry of Employment and the Economy. In addition to the Ministry of Employment and the Economy, their operations are steered by the Ministry of the Interior, the Ministry of Agriculture and Forestry, the Ministry of the Environment, the Ministry of Transport and Communications, and the Ministry of Education and Culture.

The Centers' duties include:

- Advisory, financing, and development services for enterprises; employment-based aid and labor market training; handling of agricultural and fishery issues; addressing of immigration matters; and EU structural fund projects.
- Environmental protection, steering the use of land and construction, nature protection, monitoring of the state of the environment, and usage and management of water resources.
- Road maintenance, road projects, handling of transport permit issues, traffic safety, and public transport and island traffic.
- Vocational education, library services, sports and physical training services, the education system, and youth services.

- Steering and supervision of the activities of Employment and Economic Development offices and safeguarding of the public interest in relation to environmental and water issues.

The table below shows the unemployed jobseekers and vacant jobs in each area of Centers for Economic Development, Transport and the Environment in April 2012. The underlined centers are located in the ERDF (European Regional Development Fund) programme area in Southern Finland. For example in the Uusimaa region there were 53 517 unemployed jobseekers and 17 611 job vacancies in April 2012. The number of unemployed jobseekers was 202 less than in April 2011 and the number of vacancies was 1483 more than in April 2011.

Table 1: Unemployed jobseekers (includes laid off of the unemployed) and jobs vacant in April 2012.

Centre for Economic Development, Transport and the Environment	April 2012	March 2012	April 2011	Change		Laid off of the unemployed	Share of the unemployed of the labor	April 2012	March 2012	April 2011	Change	
	Unemployed jobseekers			April 2012	2012			April 2012	2012	Jobs vacant *	April 2012	2012
<u>Uusimaa</u>	53 517	54 795	53 719	-202	0	2 369	6,2	17 611	20 334	16 128	1 483	9
<u>Southwest Finland</u>	20 045	20 531	20 596	-551	-3	1 523	8,4	2 709	3 993	2 567	142	6
Satakunta	10 266	10 885	10 737	-471	-4	770	9,2	1 619	2 569	1 583	36	2
Häme	18 120	18 876	18 565	-445	-2	1 259	9,7	2 243	2 747	2 588	-345	-13
Pirkanmaa	23 767	24 468	24 901	-1 134	-5	1 373	9,4	2 850	3 812	2 906	-56	-2
Southwest Finland	17 443	18 107	16 953	490	3	1 159	11,4	1 892	2 110	1 550	342	22
South Savo	7 622	7 880	7 234	388	5	629	10,7	766	1 602	1 093	-327	-30
North Savo	11 997	12 524	12 093	-96	-1	965	10,1	2 173	2 447	2 106	67	3
<u>South Karelia</u>	10 567	10 838	9 571	996	10	794	13,4	671	1 324	869	-198	-23
Central Finland	15 530	16 039	14 864	666	4	999	11,5	1 101	1 190	1 429	-328	-23
South Ostrobothnia	6 760	7 105	6 396	364	6	827	7,0	1 563	2 111	1 414	149	11
Ostrobothnia	7 285	7 618	7 130	155	2	580	5,9	2 068	2 791	2 100	-32	-2
North Ostrobothnia	19 946	20 464	19 080	866	5	1 557	10,3	3 088	3 229	2 316	772	33
Kainuu	4 572	4 572	4 581	-9	0	343	12,7	414	611	487	-73	-15
Lapland	11 280	10 871	10 688	592	6	701	12,5	1 522	1 912	1 385	137	10
Åland	393	427	368	25	7	11	2,6	285	319	303	-18	-6
Total	239 181	246 078	237 579	1 602	1	15 881	8,7	42 978	53 435	40 980	1 998	5

The numbers mean those unemployed jobseekers whose job application were valid during the calculation day and those jobs which were still open in the calculation day. Calculation days were 30.4.2012, 30.3.2012 and 29.4.2011.
*Contains the open jobs abroad.

Future Workforce and Educational Demand Surveys

In the study of the future workforce and education demands of the logistics industry the aim was to examine employment, training and competence issues. Two identical surveys were sent to The Centers for Economic Development, Transport and the Environment in Southern Finland and to Southern Finnish employment agencies. The third survey, that was slightly different, was sent to the cooperation companies of the ESLogC project. In the cooperation companies' survey the same topics (employment, training and competence issues) were more widely dealt with. In this publication the two former surveys are discussed together and the results of the third survey will be presented individually. None the less, the results of the surveys are comparable with each other.

Nine logistics experts from four different offices answered the survey directed to the Centers for Economic Development, Transport and the Environment in Southern

Finland. Eleven persons answered the survey directed to the employment agencies in Southern Finland. The survey received four electronic answers, and seven answers from personal interviews. These eleven interviewees specialize in recruiting staff for the logistics field. The survey directed to the cooperating companies was answered by 26 persons. 38,5 % of the people who took the survey represented logistics management. The other answerers represented sales, human resources or the executive level.

The surveys directed to the Centers for Economic Development, Transport and the Environment and the employment agencies included questions about the logistics industry's professional titles, the number of job vacancies and job seekers, the educational backgrounds of the jobseekers and the logistics personnel and the type of education most suitable for the logistics personnel. Additionally, the survey enquired the type of competence required in logistics and the level of the current logistics education. Each question covered four different levels of staff: the management level, the supervisor level, expert level and the employee level. The employment agency companies also gave a few explanations to their answers. In this study the explanations follow each answer.

In her thesis, Leivo examined the varying answers from the Centers for Economic Development, Transport and the Environment. The reason for some of the quite opposite answers given by the Center's experts could be the geographical circumstances. Although the survey results did not show how each individual interviewee had answered the questions, one can suppose the answers have been divided, especially in the workforce issues. It has been known for a long time that the traffic volume through Finland to Russia is high. Any person who travels from Helsinki to Vaalimaa can see the amount of the freight traffic. Also the truck queues on the road E18 to Vaalimaa border station indicate the abundant export towards East. If the traffic towards East is heavy, it can probably be expected to influence the employment situation.

Future Workforce and Education Demands of the Logistics Industry Survey

(For the Centers for Economic Development, Transport and the Environment and to the employment agency firms)

Logistics industry vacancies and job seekers now and in five years

According to the results from both studies there seems to be few job vacancies at the logistics management level. The Economic recession and companies' internally advertised vacancies are the main factors. It was estimated that the management level is satisfied with its work duties which also affects the number of vacancies. According to the employment agencies there will be few management level vacancies in five years' time. However, the Centers for Economic Development, Transport and the Environment believed that the vacancies will increase. The employment agencies gave some reasons for their answers: the logistics circles are small and it's well-known who is suitable for management tasks, which makes it easy to fill vacancies. Also the internal career paths of the companies were mentioned, in other words the job applications are not public.

The interviewees from the Centers for Economic Development, Transport and the Environment did not know the current or the future number of job seekers at the management level. The employment agencies' answers varied as well. The number of jobseekers was estimated to be both large and small. The number of future job seekers was considered to be low. It was noted that there may not be unemployment as such, but instead job changers who want to proceed with their careers. The internal career paths or internal transfers of employees within companies were thought to affect the numbers. The respondents also believed that the number of vacancies will increase after the recession.

According to the results of both studies, there seems to be few job vacancies at the supervisor level. A phenomenon similar to the management level can be seen at the supervisor level: job vacancies are filled internally which affects the number of vacancies. On the other hand, some of the interviewees estimated that there are more job vacancies because these job vacancies are more public than at the management level. According to the results of both studies, there seems to be a lot of supervisor level job vacancies after five years. According to the replies from the Centers for Economic Development, Transport and the Environment, the number of job vacancies is substantial. Retirement of logistics personnel and general economic growth was expected to increase job vacancies. And because the supervisor tasks are not tempting and generally speaking the work is heavy, more jobs will be open in the future.

The number of job seekers at the supervisor level was estimated to be high at the moment. However, the answers from the Centers for Economic Development, Transport and the Environment were divided in half: the number of jobseekers was considered to be both equally large and small. Opinions about future vacancies varied within the employment agencies. The number of jobseekers in five years was estimated to be both small and large. The interviewees from the Centers for Economic Development, Transport and the Environment did not know how to comment on the future. In discrepancy to the previous question the employment agencies considered that a supervisor's position is desirable but on the other hand the job is not alluring.

According to the results of both studies, there seems to be few job vacancies at the expert level. It was thought that the experts are recruited from competitors, or they move from sector to sector. Also corporate acquisitions can influence the number of job vacancies. In that case an employee will be moved to the expert position without a public search. The interviewees from the Centers for Economic Development, Transport and the Environment did not know how to comment on the future of the job vacancies at the expert level. The employment agencies said that there are a lot of job vacancies after five years at the expert level. The improvement of the global economic situation and the retirement of logistics personnel were estimated to increase jobs. On the other hand, automation and information technology can reduce jobs.

The question of the number of jobseekers at the expert level divided the answers: the number of jobseekers was again considered to be both large and small. The expert position was considered desirable, and because of that there are a lot of job seekers at the expert level. Changing jobs was thought to be frequent. The logistics industry's lack of trendiness was considered to reduce the number of job seekers. The interviewees from the Centers for Economic Development, Transport and the Environment did not know how to comment on the future of the job seekers at the expert level.

The employment agencies saw that the number of vacancies in five years will be low. The aforementioned lack of trendiness and the internal career paths within companies affect this.

According to the results of both studies there seems to be a lot of job vacancies at the employee level. The employment agencies even consider the number to be very high. The vacancies are hard to fill because the industry does not attract applicants as the work is hard and the wages low. The respondents thought that qualified employees are rare. Also the concentration of logistics to the metropolitan area and within communities contributes to the number of jobs because large logistics centers absorb more employees than before. According to the results of both studies the number of employee level jobs was predicted to be very high in five years' time. The same reasons apply here: the logistics industry is not attractive and employees change frequently.

The employment agencies estimate the current number of jobseekers at the employee level to be low. However, the estimates from the Centers for Economic Development, Transport and the Environment were both high and low. According to the employment agencies young people today are not interested in storage work and the previously mentioned laborious work reduces the number of job seekers. Also the low salary is a factor. At present, there is an attitude of: "if no other work is available, you can apply for warehouse work, although it is considered a lousy job". One view was that job-seekers do exist but they are not very skilled which makes them unsuitable for the job. According to the answers from the Centers for Economic Development, Transport and the Environment there will be few job seekers at the worker level after five years. The employment agencies predict the number of job seekers at the worker level to be extremely low after five years because the jobs in the field are seen as the last option. In the future, there will be a shortage of skilled labor at the worker level.

The most suitable education for the logistics industry

The employment agencies' answers and those of the Centers for Economic Development, Transport and the Environment were quite consistent in terms of the most suitable education of the different labor levels in the logistics industry. The most suitable degrees for the management level were Bachelor of Business Administration, Engineer, Master of Science in Technology and Master of Science. Logistics degree and work experience were mentioned as well.

The most suitable degrees for the supervisor level were Engineer and Bachelor of Business Administration. Work experience was also mentioned. It was also thought that a basic degree in logistics was sufficient for a supervisor's position. One respondent thought that proceeding to the supervisor level was only possible via the corporation's own educational system.

According to the answers, the most suitable degrees for the expert level are Engineer and Bachelor of Business Administration. Also a basic degree in logistics is sufficient for the expert of logistics industry.

According to the answers the most suitable education for the employee level seems to be a basic degree in logistics and other vocational education. Also a genuine interest

in the work and work experience were mentioned. It was also suggested that this level requires labor experiment, apprenticeship training, a basic degree in data processing or supplementary education in logistics.

The most important competence areas in the logistics industry

The answers from the employment agencies and the Centers for Economic Development, Transport and the Environment were quite consistent about the most important type of competence on different levels of logistics staff.

The most important competence areas of the management level seem to be human resource management, general working life skills, financial skills, the ability to manage large entities, anticipation skills, leadership skills, knowledge on the collective agreement and law, organizational skills, cost efficiency, knowledge of the supply chain management, customer service skills, language skills, knowledge on the human nature and knowledge on the transportation systems.

According to the answers, the most important competence areas of the supervisor are human resource management, organizational skills, leadership skills, understanding logistics, being familiar with the legislation of the logistics industry, organizational skills, cost efficiency, knowledge on the supply chain management, customer service skills, local knowledge, language skills and knowledge on the transportation systems.

According to the interviewees, the most important competence areas of the expert level are understanding logistics, the ability to manage large entities, general leadership skills, expertise in one's own field, organizational skills, cost efficiency, knowledge on the supply chain management, computer skills, customer service skills, local knowledge, language skills and knowledge on the transportation systems.

According to the answers, the most important competence areas of the employee level are motivation (includes attitude, mental abilities and resources, diligence and precision, activity, spontaneity, social skills and commitment to work), vocational competence, ability to use machines/vehicles, personal skills, language skills, knowledge on the human nature and knowledge on the transportation systems.

The most common education among the jobseekers in logistics

The survey results indicated that the most common degree titles among jobseekers who apply for management positions in logistics are Master of Science in Economics and Business Administration, Engineer and Master of Science in Technology. Additionally, Bachelor of Business Administration, special vocational degree in the warehouse branch and work experience were mentioned. The most common degree titles among jobseekers in the supervisor level seemed to be Engineer, Bachelor of Business Administration, Master of Science and a basic degree in logistics. At the expert level the common degrees are Engineer and Bachelor of Business Administration. Also a special vocational degree in the warehouse branch and a basic degree in logistics were mentioned. Some of the respondents did not have information on the education of jobseekers at the expert level. According to the survey, the most common education

among jobseekers at the employee level are a basic degree in logistics, other vocational education, apprenticeship-shaped secondary/comprehensive education and secondary school education. Additionally, some of the interviewees said that the Finnish Matriculation Examination and Vocational Qualification in Business and Administration are general educational backgrounds among the job seekers of the employee level.

The most common education among employees in logistics

This subject generated similar answers from the employment agencies and the Centers for Economic Development, Transport and the Environment. The most common degrees at the management seem to be Master of Science, Master of Science in Technology, Engineer and Bachelor of Business Administration. Also supplementary training and work experience were mentioned. One respondent from the Centers for Economic Development, Transport and the Environment thought that education at the management level is not as significant as professional know-how. The answers suggested, that the most common degree titles at the supervisor level are Engineer, Master of Science, Bachelor of Business Administration, a basic degree in logistics or special vocational degree in the warehouse branch. Furthermore, it was suggested that at this level competence is more important than education.

The survey results indicated that the most common degree titles at the expert level are Engineer, Master of Science and Bachelor of Business Administration. Two interviewees from the Centers for Economic Development, Transport and the Environment said that the educational background of the persons who work at this level is a University level degree in logistics, a degree in International Trade or a basic degree in logistics. Again, competence was considered more important at this level than education. According to the survey results, the most common education among employees at the employee level are a basic degree in logistics, other vocational education, upper secondary school education, comprehensive education or vocational apprenticeship education. Some of the interviewees did not know how to take a stand on this question.

Logistics education's correspondence to employers' requirements

When enquired about the correspondence of the logistics education with employers' requirements, eight interviewees from the Centers for Economic Development, Transport and the Environment did not know how to answer. Two of the interviewees believed that the staff at the management and worker levels possesses education that meets their employers' requirements. Two respondents also believed that although the employers are satisfied with their employees' education at the employee level, they would nevertheless prefer to further educate their staff.

Seven of the interviewees did not know how to answer the questions concerning the management level and employee level at all. None of the respondents knew how the education at the supervisor and management levels corresponds to the employers' requirements. The employment agencies gave some more views on this question. However, the answers were divided into four answer alternatives ("Yes", "To some extent", "No", "Do not know"). The next section includes the exact numbers of interviewees and answers.

The correspondence of education at the management level with the employer's requirements mostly received "Do not know" and "Yes" answers. It was thought that the correspondence is difficult to determine. On the other hand, the educational level in Finland is generally high irrespective of industry. However, it was suggested that education at this level should be more pragmatic. It was agreed that the education in business and/or engineering are good backgrounds for the management positions as long as the practicalities of the job are learned at work. Two other interviewees said that the education at the management level does not correspond to the employer's requirements. According to the other answerer, any education does not correspond to the employer's requirements, because management tasks require work experience. It is rare for a graduate to be recruited as a manager. Work experience is a major factor at the management level. Another interviewee thought that the education does not meet the employers' requirements because there is a lack of competence. One of the interviewees believed that a logistics education meets the employers' requirements to some extent. The education provides the employee with the required skills and tools for the job, such as IT and accounting skills and economic competence.

The answers regarding the correspondence of the education at the supervisor level were distributed fairly evenly: "To some extent" occurred twice and the other alternatives ("Yes", "No" and "Do not know") were chosen twice each. The results suggested that the theory included in the education should be reduced and practical training increased because competence is best adopted in practice. The education should provide a better understanding of corporate activities and the economy. Human resource management should be better covered, as well as employment and labor legislation issues.

The supervisor level should also learn the skills in interacting with employees and motivating them. Logistics engineers, for instance, are not necessarily trained in this area. According to one response, work experience was a more significant factor than education. Some of the respondents thought that the logistics education might have slightly improved because the Bachelor's degree in Business Administration allows specializing in logistics. However, advancing directly to the supervisor level is not considered possible. Two interviewees could not define the correspondence of the education to the employers' requirements. Similarly, two interviewees believed the education is sufficient for the employers' requirements. Views had not been added to these two answers.

Two interviewees thought that the education does not fulfill the employers' requirements. According to the other answer there is a constant shortage of supervisor skilled persons at the middle management level. For example, engineers with supervisor skills are very challenging to find. One reply suggested that management skills are equal with work experience. For example, the search for project managers often ends without results and this phenomenon is evident throughout the country in Finland. The other interviewee thought that the education does not fulfill the employers' requirements because of insufficient competence.

Eight interviewees addressed the question on the correspondence of the logistics expert's education to the employers' requirements. Three respondents could not define the correspondence. One of the three interviewees also saw that the expert level is an "intermediate stage" at the logistics centers and hence the expert position is not very

sought after. The expert position would require more insight into working life and more frequent practical training during the studies.

Three interviewees thought that the education does not fulfill employers' requirements. One interviewee referred to a deficiency in competence when arguing that the education does not meet employers' requirements. According to another respondent, comprehensive/basic education is not sufficient for the job tasks. Training tailored to the needs of a specific corporation would be desirable. Experts learn by themselves, occasionally they manage tasks well, but at times the house rules are obeyed without any prospects for development. This is because it is safe, when the vision and ability for business development do not exist. The third interviewee emphasized work experience. Expertise is not possible without work experience and broad work experience ensures good expertise. One interviewee thought that the education partly responds to the employer's requirements. However, it was added that university education should include more practical training and reduce the amount of theory. The expert's education should involve more work practice. One interviewee was confident that the expert's education meets the employers' requirements in the logistics industry. This answer was not reasoned.

Nine interviewees pondered the correspondence of the education at the employee level. Five of them thought that the education does not meet the employers' requirements. One interviewee explained this view by the fact that finding good applicants is challenging. It can be concluded that although educated applicants exist, they are not sufficiently educated. Another respondent emphasized better training in the control of machinery and equipment. The educational institutions do not provide machinery and therefore no opportunities for the students to practice their use. It was also argued that theory does not meet practice. Through theory, vocational institutions are not capable to demonstrate how the field actually operates. The third respondent also suggested that there is a demand for better training on the management of machinery and equipment. Also the necessity of training in the occupational safety issues was mentioned separately. According to the fourth answer the education does not fulfill the employer's requirements and therefore qualified logistics personnel are very rare. In general, the employees learn practical skills through work. The tasks are different in every company and the most important elements are a good attitude, readiness to do shift work, a forklift truck license and other qualifications (for example road safety, fire, occupational safety and hygiene passports), which offer access to the basic storage or production work. The fifth answer stated briefly that the education does not necessarily fulfill the employers' requirements.

Two interviewees believed that the education meets employers' needs to some extent. According to one answer, basic knowledge and principles exist after completing the education but there are no guarantees of the competence. The other respondent emphasized the training in the control of a forklift truck and other machinery. In addition to this there is a demand for more training in life management, more specifically in the understanding of workers' rights and duties. It is a question of working life skills. Before educating anyone in the logistics industry it should be ensured that the person really wants to work in the logistics industry. The basic degree in logistics is not necessarily a merit, if a person enters the field unwillingly/reluctantly. Two interviewees thought that the education at the employee level in the logistics industry meets employers' needs. These answers were not reasoned.

Additional thoughts

At the end of the survey the interviewees were encouraged to openly present their thoughts on the subject. The interviewees gave their ideas on the working methods, occupational safety issues and better training in the management of the systems and machinery used to perform the tasks. A compulsory license for every machine would be required, including the forklift. A license is not currently required by law. The supervisor is responsible if an accident happens.

According to one answer, competent persons for management and middle-management are most likely to be found in the future, but at the employee level it is a challenge. In addition to increasing the training in the machinery utilization, equipment and systems, the institutions should better advertise the logistics industry. This way the interest in the logistics industry could increase and the motivation for an education in this field could improve. It was also found that work orientation is expensive for the companies to arrange; therefore a competent education could give the employee good practical skills. The logistics sector should be more open to applicants. In addition to the fact that the logistics industry could attract more prospective employees, the perception that the job seeker “loses” something when recruited through an agency should be set aside.

The employment agencies can be viewed as a company’s “human resource department”. Job seekers would need more training on attitudes. Additionally, educational institutions would have to be in closer cooperation with companies in the field in order to offer students up-to-date information. This would guarantee the fact that tuition and students (after graduating) have concurrent knowledge of the field. The companies or the employment agencies are not aware of the degree titles that the graduates have. Better information flow between businesses and educational institutions is needed; about companies’ requirements and the degrees held by the graduates.

The surveys directed at the Centers for Economic Development, Transport and the Environment generated several thoughts:

- Current management level lacks competence, especially in the transport sector and in the small companies
- It would be better for the businesses to train their own staff for the managerial positions instead of hiring new personnel from outside the company
- Logistics industry will expand during the next few years
- The competence level of the companies should be improved so that the personnel could advance in their careers.
- The education should emphasize practical training so that the student could build connections with the right companies at an early stage.
- The personal qualities of the applicant are more important than education.

- Practical tasks are more important than theory and educational institutions are often unable to offer the education required by the companies
- Today's education is too general and therefore the number of professional studies is very small. (The basic vocational education could take one year after which the students could apply for apprenticeship training, which would guarantee them a job. The employers would get an opportunity to train their employees according to their specific needs and requirements)
- Apprenticeship training is a motivating learning model because the promise of a job motivates the student.
- An education can never be broad enough and therefore work experience is more important than education
- The students at universities are becoming a problem because they remain registered at the institution as long as they have a permanent job. This delays graduation.
- Many university graduates are left unemployed and therefore new professions have to be created for them with the help of additional education.
- The logistics industry seeks multi-skilled employees and therefore one degree is not sufficient anymore.

Workforce Demand Survey for Cooperation Companies of the ESLogC Project

The objective of the Workforce Demand Survey was to clear the ESLogC project backgrounds in order to being able to give answers to the question: "How to improve the logistics competence and to secure the availability of competent workforce?" The purpose of the inquiry was to explain the present state and the future competence demands of workforce in logistics field. The gathered information was compared to the supply of the degree programmes in logistics in Southern Finland.

The Workforce Demand Survey inquired the company's number of staff in Finland, the percentage of foreign staff and of leased labor. The change in turnover and the profitability in recent years and the changes in the number of staff were asked as well. Additionally, the present age structure of the staff was inquired. The changes which are related to the workforce were asked from the points of four different views (a performing level, the level of supervisor, expert level and the uppermost management level). The changes in workforce demands were inquired in the perspectives of one and five years. The recruiting difficulties and the reasons for these difficulties were charted also. The inquiry surveyed the new and the decreasing logistics competence demands. The education needs of the present staff were examined with the help of the survey as well as the development needs for the logistics education and the expected cooperation methods between companies and educational organizations.

Approximately 23 % of the survey respondents were working in transportation or storage field and 23 % were working in the branch of industry. The rest of the interview-

ees operated in the sector of wholesale and retail business. In the companies that had participated the survey, the foreign workers' share of the whole staff was under 5 %.

According to the answers, 61,5 % of the companies' share of leased labor is 1-5% and 34,7% have a 5-20% share of leased labor. The demand for leased labor and outsourcing was estimated and 55,6 % of the interviewees believed that the demands will increase a little and 38,8 % thought that the demand remains the same. The use of leased labor in order to fulfill the seasonal workforce demand is estimated to be on the current level in the near future. The estimates for a small growth in the leased labor utilization may refer to an optimistic view on the small growth in entrepreneurship in the next ten years in Southern Finland. The level of outsourcing was estimated to stay the same by 47 % of the interviewees and 41.2 % estimated a small growth. On the basis of these answers, the companies do not see outsourcing as a major factor in improving the efficiency and profitability at the moment as they saw at the end of the 20th century.

The business situation of the companies that answered the survey was examined in relation to the change in the estimated turnover in the next five and ten years and in relation to the change in profitability. On 95.2 % of the companies that answered, the profitability changed 0-20 % last year. The anticipations of the near future are carefully optimistic; 52.4 % of the interviewees believed that the turnover of the company is increasing a little and 28.6 % of the interviewees believed that the turnover remains unchanged. In the medium term expectations are more affirmative for the turnover among the ones who had answered because 85.6 % of the interviewees believed that the turnover of the company is increasing. The interviewees see the future (10 years) in a positive light and 47.6 % of the interviewees believed that the company turnover is increasing a lot and 38.1 % believed that the turnover of the company is increasing a little.

The survey respondents estimated that the change in the number of logistics personnel related to the change in business turnover is stable since 60 % believed that the number of logistics personnel remains the same. In general, the respondents believed that the progress of logistics personnel in the next five and ten years follows the same pattern: 51.8 % believes the amount of personnel will remain the same and 36 % thinks it will increase to some extent.

It is expected that during the next ten years, the number of staff at the performing level increases more than the demand for superiors, experts or the uppermost management. After examination of the performing level's recruiting issues, it was noticed that 75 % of the interviewees did not believe the recruiting problems of this staff group exist at all. According to the survey results, the recruiting problems on the management level are similar as at the performing level. In the evaluation of the recruiting problems at the expert level, 87.5 % of the answerers did not see any problems in the recruiting process. None of the interviewees saw any recruiting problems at the uppermost management level either. These results conflict with the answers of the Centers for Economic Development, Transport and the Environment and the employment agencies. According to them, there will be a shortage of competent and motivated staff on the performing level of logistics, because of the heavy nature of the logistics work, the low salary level and the bad reputation of the logistics field.

The workforce demand survey clarified the interviewees' opinions on the future business environment's required competence and the possible decreasing competence demands. The interviewees thought that the competence demands related to routine tasks, manual identification, basic road transport, manual warehouse logistics and heavy physical work will decrease. The rising competence needs related to the understanding of entities, quality control, automation and IT applications. Additionally, competence management, teamwork skills, social and communication skills, work community skills and process management were emphasized. Comprehensive language skills and multi-skills are also important now and in the future. The above mentioned competence demands were considered essential both in the Centers for Economic Development, Transport and the Environment and in the employment agencies.

Approximately 84,2 % of the cooperation companies' representatives thought that the logistics education at the moment is sufficient. There is a slight conflict between these answers and the Centers for Economic Development, Transport and the Environment and employment agencies' survey results that indicated more discontent with the current logistics education.

The cooperation companies' survey asked for the representatives' comments and feedback on the logistics education and the education development. The following matters arose:

- Preparedness for global purchasing and distribution
- Operations capacity measurement, utilization of information processing systems and the development of process transparency
- Development of logistics education into more general and entity focused
- Short term further education, such as fork lift driver's license training and industrial safety training should be made available more frequently
- Education on specific logistics issues is needed. Basic competence is well provided in educational organizations
- The quality of current educators is not consistent or sufficient enough. Logistics professionals' involvement in automation development is also needed.
- The share of calculation and financial skills should be increased

The final question in the cooperation companies' survey concerned the cooperation with educational organizations. The respondents wished to get more information about the degree programmes and about the possibilities to participate in the planning of the education, Thesis projects, reports and individualized education that observe the companies' demands and the training motivation. The representatives of the Centers for Economic Development, Transport and the Environment and employment agencies hoped that the cooperation between logistics companies and educational organizations would increase in order to improve the companies' perception of available education and the educational organizations understanding of the current and the future logistics competence demands.

The use of leased labor to fulfill the company's workforce demands was estimated of being sufficient in the near future as well. There was an estimate of minor increase in

the demand for leased labor, which may refer to an optimistic view on the small increase in entrepreneurship in the next ten years in Southern Finland.

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Soili Kela

LOGISTICS EDUCATION AT UNIVERSITIES

This article examines the Finnish universities in Helsinki, Lappeenranta, Oulu, Tampere, Turku, and Vaasa. Three of the universities are located in Helsinki.

The concept of logistics is difficult to define exactly. Therefore, many different degree programmes related to logistics and to its sectors have been chosen for this article. All the degree programmes that have been examined in the education analysis include a number of study modules more or less related to logistics. From these degree programmes one graduates with a Bachelor of Business Administration diploma or a Bachelor of Science diploma (BBA or B.Sc (Tech.)), 180 credits.

Furthermore, it is possible to continue these studies, and accomplish a diploma for Master of Science in Economics and Business Administration (MBA) or as Master of Science in Technology (MSc Tech.), 120 credits. The Master's degrees consist of 300 credits altogether. In addition, it is possible to do postgraduate studies and graduate as a Licentiate or as a Doctor of Economic Sciences, of Science in Technology or Political Sciences. The licentiate's degree consist of 150 credits and the doctor's degree 240 credits. All the degree programmes that have been examined in this education analysis contain logistics related studies.

Universities in Finland

- Aalto University (Helsinki)
 - Master of Science in Economics and Business Administration (BBA, MBA)
 - Marketing (BBA, MBA)
 - Management (BBA, MBA)
 - Industrial Management
- University of Helsinki
 - Food economics (BBA, MBA)
- Lappeenranta University of Technology
 - Purchasing management (BBA, MBA)
 - Management and organizations (BBA, MBA)
 - International Marketing (BBA, MBA)
 - Industrial Management (B.Sc (Tech.), M.Sc (Tech.), Lic.Sc. (Tech.), D. SC. (Tech.))

- University of Oulu
 - International Business (BBA, MBA)
 - Marketing (BBA, MBA)
 - Industrial Management (B.Sc (Tech.), M.Sc (Tech.))
 - Main subjects of postgraduate degrees: Management and organization, International Business, Economics, Management accounting, Logistics, Marketing, Financing (Lic. Sc. (Econ.) (B.A.), D.Sc. (Econ.) (B.A.)).

- Svenska Handelshögskolan Hanken (Helsinki)
 - Marketing (BBA, MBA)
 - Management of the delivery chain and Corporate geography (BBA, MBA)
 - Main subjects of postgraduate degrees: Accounting, Business law, Economics, Entrepreneurship and Management, Financing, Information Systems Science, Management and Organizations, Statistics, Management of the delivery chain and corporate geography (Lic. Sc. (Econ.) (B.A.), D.Sc. (Econ.) (B.A.)).

- Tampere University of Technology
 - Information and Knowledge Management (B.Sc (Tech.), M.Sc (Tech.), Lic. Sc. (Tech.), D.sc. (Tech.))
 - Industrial Management (B.Sc (Tech.), M.Sc (Tech.), Lic.Sc. (Tech.), D. sc. (Tech.))

- Turku School of Economics
 - Management and Organizations (BBA, MBA)
 - Marketing (BBA, MBA)
 - International Business (BBA, MBA, Lic. Sc. (Econ.) (B.A.), D.Sc. (Econ.) (B.A.))
 - Logistics (BBA, MBA)
 - Main subjects of postgraduate degrees: Accounting and financing, Management and Organization, Marketing, International Business, Logistics, Entrepreneurship, Economics, Business law, Economic geography, Economic sociology, Quantitative methods of Economics, Information Systems Science (Lic. Sc. (Econ.) (B.A.), D.Sc. (Econ.) (B.A.), D.S.Sc.)

- University of Vaasa
 - Industrial Management (BBA, MBA)
 - Management and Organizations (BBA, MBA)
 - International Business (BBA, MBA)
 - Marketing (BBA, MBA)
 - Main subjects of postgraduate degrees: Management and Organizations, Accounting and financing, Economics, Marketing, Commercial law, Information technology, Industrial Management, Business mathematics, Statistics (Lic. Sc. (Econ.) (B.A.), D.Sc. (Econ.) (B.A.))

Correspondence of the Logistics University Education with the Future Competence Requirements

The logistics studies offered by the degree programmes fulfill the competence development requirements of logistics management, planners and purchasers. The issues in need of improvement have been defined by logistics professionals based on competence requirements. Furthermore, nowadays several universities offer chargeable MBA education which could serve as the solution in developing logistics personnel's competence.

Studies directed at purchasers are offered by the University of Lappeenranta, with in the degree in Management of Purchasing. Other universities also offer studies for developing skills in purchasing. Some study units cover the topic of sustainable development, but the number of units varies quite a lot between universities. General working life competence is regarded as a significant present and future skill. However, few degree programmes offer studies in this subject although some basic studies in the Master's degree give some attention to it.

Development Proposals for Logistics Education in Finnish Universities

The themes discussed below are critical in terms of the development of the competence needed by logistics management, planners and purchasers. The proposals for development were written out according to the findings of the ESLogC project as well as the analysis of the universities' degree programmes in Logistics.

The logistics competence development requirements are divided into five main themes/points:

1. Supply Chain Management
2. Operations Planning
3. IT Operated Operations Measurement, Development, Follow-up and Assessment
4. Competence Management
5. Cooperation

There are similar requirements in the skills and competence of logistics management, planners and purchasers which depend on the size and the field of business and the number of employees. Smooth cooperation between the groups is fundamental in logistics. Our view is that the most important areas of development are in management and in planning, as well as in purchasing.

Supply chain management

The management of the supply chain is all about predicting the demand and directing the orders fast, economically and effectively through the supply chain. Secondly, the supply chain consists of several different processes and process owners. In this case, coordination and synchronization of processes are crucial because poor coordination and cooperation cause extra work and costs. This can lead to the weakening of profitability. With efficient coordination and sufficient information the supply chain can be managed rationally. This helps in gaining positive synergy assets.

Thus from the point of view, in logistics management, planning and purchasing activities the central issue is the knowledge of the supply chain processes and its comprehensive control. In the curriculums of the future the emphasis should be on the process competence.

Thirdly it is essential to use IT systems in supply chain control whereby the operations of the whole chain are managed. Professional management and control produce savings and cost efficiency. Cost efficiency can be improved by using further automated Enterprise Resource Planning systems. Good IT skills and processes help adjusting to the ever-changing environment and systems. In addition to IT skills, process management training can thus be regarded essential for future competence. Currently there seems to be some need for this type of training.

Operations planning

The rational planning of operations is the key to successful business. A successful business and its planning require constant development of the organization's competitiveness and innovative operations, which cannot be successful without a clear and strong mission, vision and strategy. Secondly, in operational planning it is essential to being able to anticipate the changes in the global environment. Pressure for change is also caused by the tightening social demands, among other things the form of responsible and ethically sustainable operations.

At the operational level of the organization the planning of the operations includes the planning of work shifts, orientation of new employees, planning of substitute systems, arrangement of work circulation, rationalizing the functions of the organization and daily management/control of business operations. These important matters have an effect on the profitability of the business. The superior skills of this kind are essential competence skills for the organization and learning them is often taken for granted.

IT operated operations measurement, development, follow-up and assessment

Logistics can be seen as an operation based on main processes and sub-processes. The different levels of the processes can be described, measured and estimated. To enable the development and management of the organization its operations must be measurable internally and externally.

Secondly, measuring should be systematic and long-term for the data to be extensive, comprehensive and credible. Measuring the operations can be conducted by internal evaluation of processes and operations and externally, for instance by collecting customer feedback data. Therefore, by measuring it is possible to follow the organization's objectives and profitable activities. This is often carried out with the help of information processing systems. To satisfy the future competence requirements, university studies should pay attention to measurement, development, follow-up and assessment of organizational operations with the help of IT systems.

Competence management

Strategic management of human resources is already present in some advanced logistics companies. A significant part of it is the development of the personnel's competence which has received special attention recently. In today's rapidly changing operational environment the staff at every level should be prepared to adjust to changes. Moreover, logistics studies should focus more on change management: how to communicate and make employees committed to the transitions and changes.

Social skills are vital in working life, but has this been taken into consideration in education? Many factors indicate that social skills are not regarded fundamental in our society. This issue should also be attended to university education.

Skills needed in the workplace community and superior and employee skills cannot be ignored either. The management and the entire workplace community should encourage the employee to develop him/herself so that he/she is prepared for future challenges. Employees with multiple skills are in demand. Life-long learning and development are emphasized as well as skills such as information search. The employee is ultimately responsible for developing her skills but the management should emphasize its significance and act as an exemplary. For example, the management teams from the ESLogC project cooperation companies wished to express the importance of personnel competence development. Taking part in a project of this kind indicates commitment from their part. Putting theory into practice is a factor that best commits and motivates employees.

In the global environment of logistics language skills are essential. In the future every employee in the logistics field should know at least English. Global companies operate largely in English and operation management is also conducted in English. Moreover, the increasing Russian trade should be considered in the curriculums.

Anticipating changes is crucial for management and planning. Changes in legislation can cause new competence requirements that should be realized in the institutions providing logistics education. Are the current curriculums unable to answer to the challenges posed by the changing operational environments?

Cooperation

Operational environments are globalizing rapidly and this makes competition fiercer in every business field. Nowadays it is not possible for an enterprise to be competitive individually but the entire value chain must be developed in unison. This requires good cooperation which in turn means trust and the willingness to improve operations together.

Networking is also important for businesses. The utilizing of networks needs improvement within the logistics field and this should be a focus in the curriculums. A good example of networking is the ESLogC project where many networks were created. These networks will offer many opportunities in the future. The question is: who will benefit most from them?

Summary on the Development of Future Competence in Finnish Universities

According to the analysis of the logistics education offered at Finnish universities (Kela 2012.), the central competence requirements in the future will be:

- IT competence,
- responsible business operations,
- the management of changing operational environments and
- developing employees' professional competence.
- as operational environments become more and international, English language skills are considered fundamental.

Anu Suomäki

LOGISTICS EDUCATION AT UNIVERSITIES OF APPLIED SCIENCES

Logistics education at Finnish Universities of Applied Sciences was studied in the ES-LogC project during the autumn 2010. The analysis of the education field was carried out during 2011 and in late 2011 and in the beginning of the year 2012 the partnering Universities of Applied Sciences in the ESLogC project began to build up the development plans for the education providers they had investigated. It was discovered that the higher vocational logistics education is mainly centered in Southern Finland, however the northernmost degree programmes related to the field can be found at Kemi-Tornio University of Applied Sciences. Logistics education is provided as engineer and business administration degrees and can be studied both on Master and Bachelor levels. Education in the logistics field is rather extensive, versatile and of high quality. Each degree programme has its own strengths and emphases, thus the students have various opportunities to choose from. Engineering degrees tend to have specialized in certain sectors of the logistics field, such as Industrial Management, yet there exists degree programmes of wider field of research, such as Degree Programme in Logistics, and Degree Programme in Logistics Engineering. The same applies for business administration education, where the nature of the degree programme is less technical and more business oriented. In this article, we present the current situation in the Finnish universities of applied sciences with regard to logistics education yet foremost we present the results from our study concerning the development needs of higher vocational education. The research has been limited to applying only to the degree programmes in Logistics, Supply Chain Management and Business Logistics. The only specialized programmes that have been included in the research are Metropolia University of Applied Sciences' Degree Programmes in Procurement. The table including a list of all degree programmes in logistics field or with logistics orientation studies in Finnish universities of applied sciences has been attached to the article as APPENDIX I.

The curricula of the degree programmes taken into more careful investigation (TABLE 1) were examined mainly on a course title level. Some electronic study guides did not involve course descriptions, thus it was reasonable to analyze the degree programmes on the similar basis. The information gathered from the curricula was compared to the results from two prior studies completed in the project. The first study was realized by using workshop methods and the second one was conducted as an electronic survey. In the first study, logistics professionals from Southern Finnish logistics centers and logistics organizations were gathered together for the ESLogC project's first Future Logistics Center -Forum, in which the project team wanted logistics professionals' assistance in figuring out the definition for the logistics center and in defining the future competence level necessary for the logistics center personnel. The survey, in turn, was directed to the current personnel in logistics centers and was based on the occupational group -specific competence charts that were presented in this publication's part 1. The questionnaire was used as a tool in clarifying the current competence level of different occupational groups in terms of the competence charts' future competence areas. Both future competence demands (TABLE 2) and the current logistics center personnel's competence strengths and weaknesses (TABLE 3) were used as a baseline when the logistics education provided in the Finnish universities of applied sciences was examined. After the analysis of the current education, the project group

began to generate education development plans. In order to bring the logistics professionals again on the platform and genuinely apply their ideas and knowhow to the development of education, the project organized a logistics competence seminar. In the seminar workshop method was again utilized and the educational demands and means were unraveled per each occupational group. The competence charts were again utilized in this seminar, and the project group managed to figure out seven occupational groups' educational needs and development targets.

This article presents the results of the education analysis and the development proposals for the logistics education at Finnish universities of applied sciences that have arisen during the project.

Education Analysis

As mentioned earlier, the future competence demands and the logistics center personnel's competence strengths and weaknesses were used as a comparison material when the current logistics education was investigated. The degree programmes taken into review were limited to concern the Degree Programmes in Logistics, Supply Chain Management, Logistics Engineering, Business Logistics, International Business and Logistics and Procurement (TABLE 1). Both Master and Bachelor degrees as well as engineer and business administration degree levels were included in the studied degree programmes. Altogether two engineer level Master Degree Programmes and one business administration Master Degree Programme were examined in addition to six engineer level Bachelor Degrees and four business administration Bachelor degrees, thus the view point was maintained rather wide even though the sample was limited.

Table 1. Logistics degree programmes examined in the ESLogC project

HAMK University of Applied Sciences	Degree Programme in Supply Chain Management (Eng)
	Degree Programme in Logistics (Fin)
Jyväskylä University of Applied Sciences	Degree Programme in Logistics Engineering (Eng)
	Degree Programme in Logistics (Fin)
	Master Degree Programme in Logistics (Fin)
Kymenlaakso University of Applied Sciences	Degree Programme in Business Logistics (Fin)
	Degree Programme in Logistics (Fin)
Lahti University of Applied Sciences	Degree Programme in Business Logistics (Fin)
Metropolia University of Applied Sciences	Degree Programme in International Business and Logistics (Eng)
	Master Degree Programme in Procurement (2) (Fin)
Satakunta University of Applied Sciences	Degree Programme in Logistics (Fin)
Turku University of Applied Sciences	Degree Programme in Business Logistics (Fin)

Future competence demands were taken as main comparison material in addition to the results from the competence assessment survey. The competence demands included five main competence areas: Supply Chain Management, Operations Planning, Competence management, Partnership and IT Operated Operations Measurement, Development, Assessment and Follow-up. Each competence area contained two to seven competences. The competence areas were purposely left wide in content in order to maintain a broad view when assessing future competences. TABLE 2 has listed all the future competence demands that were used as tools when assessing the current education's correspondence to logistics center personnel's competence needs in the future.

Table 2. Future competence demands in logistics centers

Supply Chain Management	Operations Planning	IT Operated Operations Measurement, Development, Follow-up and Assessment	Competence Management	Cooperation
Familiarity with company processes	Layout planning	Systematic measuring of operations	Motivation	Networking
Economic impacts	Process planning	Collection and utilization of correct information	Competence demands caused by legislation	Competence demands caused by internationalization
Understanding of own role	Environmental consciousness	Indicators for cost-effective follow-up	Communication skills	
Process management	Organization	Development of data systems	Engouragement	
			Work community skills	
			Project management	

Future Competences in Degree Programmes' Curricula

The future competence demands were varyingly placed in the logistics degree programmes investigated. For instance, competence areas under supply chain management were found in each degree programme while competences concerning partnership had not been included in all curricula. Competence management was the other topic alongside with partnership that had been left out in some programmes. The scarcity of these two topics was more present in engineer level programmes whereas in business administration programmes they were more widely included. However, IT operated functions were broadly present in engineer degrees and again less so in business administration programmes. Sustainable development was one of the clear weaknesses of all occupational groups that appeared in the competence assessment survey (more information about the survey later in this article). The knowledge was rather low in all groups in this competence area that was classified under operations planning in the future competence demands. This could be partly explained as being a result from the educational deficits: Only three degree programmes had included a 15 study credit course entity on sustainable development on their curriculum. Otherwise these topics were dealt in 1-3 study modules per degree programme or left out

entirely. The future competence demands and their presence in the Finnish logistics degree programmes are dealt more precisely in the next chapters.

Every degree programme includes numerous study modules on operations planning and supply chain management related competences with different emphases. For instance, both Master Degree Programmes in Metropolia and the one Master Degree Programme in Jyväskylä all contain several study modules on process development methods, strategies and overall management of the supply chain entity. In Jyväskylä, the Bachelor degrees have been constructed by competences and for example Life Cycle Support -competence module is a positive example of bringing sustainability and environmental consciousness as a part of engineer degree programmes. The main differences between Jyväskylä's Degree Programmes are besides language in the Majors. In the Finnish programme Materials Handling and Transportation are the alternative Majors whereas in the English programme management, logistics entities and broad logistics awareness are the main subjects. In HAMK University of Applied Sciences, the English programme includes a comprehensive amount of study modules closely related to Supply Chain Management and Operations Planning competences. The Finnish programme in HAMK, however, is much more technical, thus the technical and economic knowledge the students gain in those competence areas' themes is rather strong. Kymenlaakso University of Applied Sciences has invested in the business knowhow more than other engineer programmes. Therefore Supply Chain Management and Operations Planning competences are well covered in the programme and thus offer a better, or at the very least broader view on logistics and supply chain management than in other engineer programmes. If a student desires to specialize on a certain logistics competence, Satakunta University of Applied Sciences might be the best place for him. With specialization lies the risk, of not getting as broad a view on the field as other students will at other Universities.

Approximately a half of the engineer degree programmes contained competence management and little or no partnership related competence themes. On the other hand, business administration programmes that included these topics rather strongly besides business studies then lacked studies concerning IT operative functions where engineer studies shine. Business Logistics degree programmes emphasize the business operations of logistics, when technical subjects are left as minors. In Lahti University of Applied Sciences, supply chain management and operations planning themes are fairly well handled from procurement, process control and sustainability's point of view. Kymenlaakso's programme has strengths in operative business logistics too. It also provides five different orientation alternatives for the students: Procurement, Services, Sales, International Transportation and Logistics English. The professional studies credit count is largest in Turku University of Applied Sciences and additionally there are three orientation alternatives: Procurement Management, Transportation, Warehousing and Logistics Service Development and Utilization of Logistics Technical Application. In each orientation, most if not all themes of supply chain management and operations planning competences are met. Metropolia University of Applied Sciences' degree programme is quite different from the others since there are International Business studies alongside logistics. This English programme has a 33 credit study entity of Logistics that answers to future competence demands such as operative management, procurement and distribution management.

As mentioned before, IT operative functions, competence management and partnership were the competences less frequently appearing in the studied degree programmes. Master degree programmes included quite a lot of competence management and partnership competences, though it would be strange if they did not, since the students are often aiming to or possessing management positions in the companies. IT related study modules were optional in each master degree programme. Bachelor level engineer degree programmes contained various IT utilization and functions related study modules whereas Partnership and Competence management topics were more seldom apparent. On the other hand, it is clear that engineer programmes have more mathematical and technical emphasis but for instance Kymenlaakso's Degree Programme in Logistics, both technical and business knowhow are well combined. Business administration programmes had integrated competence management and partnership themes with other business competences while IT operative functions were scant. Turku University of Applied Sciences was the only one, where that particular future competence demand had been noticed largely in orientations alternatives.

Logistics Center Personnel's Competence Strengths and Weaknesses

In addition to the future competence demands the degree programmes under examination were compared to the strengths and weaknesses of current logistics center personnel (TABLE 3) in order to find out if the shortfalls in personnel competence were consequent of educational deficits.

Table 3. Logistics Center Personnel Competence Strengths and Weaknesses

Occupational group	Competence strengths	Competence weaknesses
Logistics Management and Planning	Personal skills	Sustainable development
	Development of logistics solutions according to the company strategy	Quality control
Warehouse Superiors	Communication and personal skills	Sustainable development
	Planning, assessing and guiding the personnel functions and competence at own responsibility area	Quality standards
	Work safety	Language skills
Warehouse Workers	Goods collection process tasks	Customer and stakeholder relations
		Delivery process tasks
Forwarders	Securing the interests of the client	Sustainable development
Purchasers	Product and warehouse control	Sustainable development
	Operative purchasing tasks	Competence management
		Planning, guiding, assessing and developing the operations and economics of own unit
Customer Service and Sales	Interpersonal skills	Supply and demand control
	Planning, assessing and guiding the personnel functions and competence at own responsibility area	Sustainable development

The clearest weaknesses arising from the competence assessment survey results were the tasks dealing with sustainable development. Warehouse workers were the only occupational group that did not bottom up with sustainable development score. As we reviewed the Logistics and Business Logistics degree programmes it came through that certain degree programmes had involved rather large entities of sustainability issues in their curricula whereas other programmes had paid minor attention to sustainable development matters. HAMK and Lahti Universities of Applied Sciences had all included 15 ects sustainability study entities in their degree programmes and Jyväskylä has gone even further with its 30 ects Life Cycle Support -study entity (with ten compulsory ects and 20 optional). Kymenlaakso and Satakunta Universities of Applied Sciences have sustainability studies in their curricula, yet not as widely as in the three former Universities. All three Master Degree Programmes studied did not involve sustainable development study modules, nor did HAMK University of Applied Sciences' Finnish degree programme or Turku University of Applied Sciences' Business Logistics programme.

Other occupational groups' weaknesses listed in TABLE 3 were the competence related to reclamations, language skills, shipment process control, customer and stakeholder relations, competence management and unit operations and economics related competence. Several competences listed above improve through work-based learning, for instance through job rotation or mentoring. On the other hand, company's operations and economic management, competence management and customer and stakeholder relations can and should be educated for already during studies. If we consider the Master Degree Programmes examined, Jyväskylä's programme's compulsory studies emphasized personnel administration and customer relationship management while in Metropolia the emphasis in the business administration programme is on financial and procurement operations and in the engineer programme these matters are considered optional studies. Both programmes in Metropolia have optional study module in competence management and development. Financial Management basic studies are included in all degree programmes despite the academic title. HAMK University of Applied Sciences provides an Organization Management and entrepreneurship related study modules, which probably include customer relations management. Jyväskylä's English programme's Logistics Management study entity includes Business Relationships and Human Resources study module that for some reason has not been included in the Finnish programme. Kymenlaakso's engineer programme's curriculum does not include knowledge or customer relations management while in the business administration programme those matters are present. In Satakunta, management is widely discussed yet personnel management is not separately handled. Customer relationships are not visible in Satakunta's curriculum either. Metropolia's business administration programme includes a 17 ects entity of management issues, but competence management has not been separately titled. Customer relationships are not visible in Metropolia either, nor in Satakunta. We should however point out again, that the degree programmes were mainly analyzed at study module title level because not all electronic study guides involved study module contents. Therefore we cannot say for sure, whether some themes had or had not been integrated as part of some other study module.

TABLE 3 listed the competence strengths the occupational groups possessed. Education-wise, the competences that can be ensured through education are the development of logistics solutions according to the company strategy, competence manage-

ment and ensuring the customer and stakeholder interests. Shipment process and the operative tasks in procurement are perhaps best assimilated through work-based learning. Company strategies were covered in all examined programmes, in some more thoroughly than others. Competence management was also more relevant in certain programmes. Stakeholder and customer relations management was mainly a part of some other management related study module, thus it is hard to say whether it was more visible in some programmes than others. The main focus for all University of Applied Sciences degree programmes should be work life orientation and the aim of educating students to working life as well as possible. All degree programmes included a compulsory 30 ects practical training, however, perhaps in the logistics field, the training period could be even longer. Each programme examined has its own emphases and the students have several opportunities to choose from. However, there are things to develop in all programmes. The ESLogC project organized a seminar to implement logistics company representatives to education development. The next chapter will discuss the development needs and suggestions arising from the education analysis and the seminar results.

Educational Development Proposals for Universities of Applied Sciences

The ESLogC project's project coordinator from Lahti University of Applied Sciences, Business Logistics Degree Programme's head lecturer Ullamari Tuominen, says that educational planning in her line of education has traditionally started from inside the University. The planning team has been used to construct the curricula on the basis of personnel and time resources while the actual, current and future, competence demands have been left with a small role in the planning process. As the logistics field is now in the process of changing it is time to raise the appreciation and the attractiveness of logistics jobs by initiating a business-based curricula planning. The development of vocational education was initiated in Lahti University of Applied Sciences when logistics professionals were invited to a logistics competence seminar to ponder the educational needs of seven occupational groups: Logistics Management and Planning, Warehouse Management, Warehouse Workers, Drivers, Purchasers, Forwarders and Customer Service and Sales.

Workshop method brought out three main competence and educational demands. All occupational group representatives were expected to manage supply chain management, business intelligence and sustainable development. Naturally, the emphasis on the managed area varied according to the occupational group. Supply chain management was considered essential in all occupational groups. The development of logistics student's or newly graduated logistician's understanding of supply chain entity can be achieved by strengthening the understanding of one's own role as part of the logistics chain. The most suitable teaching methods for own role's understanding are various logistics strategy games, where the students get a true picture of a supply chain in which each student's functions affect the next student or the next step of the game. The development needs concerning this particular competence area are different in engineer and business administration degree programme. Business administration degree programmes need developing in Enterprise Resource Planning systems and logistics indicators whereas engineer programmes could enhance the amount of busi-

ness studies related to supply chain management, such as cost foundation and price formation that improve the general view of the supply chain.

Business intelligence themes should be increased in all degree levels. Largest additions should be made on engineer programmes, where the technical studies usually have the major share in the curriculum. Language studies or professional studies taught in English should be increased in engineer programmes since the logistics industry is globalizing constantly and thus each student graduating should possess comprehensive language skills in logistics vocabulary and concepts in English. Additionally, the enhancement of mentoring and networking skills and the initiation of concepts such as benchmarking that are part of today's business culture, are important to include in engineer programmes as well. Business administration programmes too have development needs. Like engineer programmes, business administration programmes should also have the augmentation of language studies on their "to do" -list. One of the objects of all business administration programmes should be the enhancement of the student's language skills to meet the international environment. If the increase of language studies cannot be done without reducing the amount of other essential themes, the option could be the changing of Finnish courses into English, when the logistics concepts and terminology would be introduced to the students simultaneously with the enhancement of the preparedness to global working. Marketing know-how and communication and negotiation skills in different customer relations should be included more and more in the business administration studies because several logistics workers function as customer servants without realizing it, when even the shortest customer contact might have a great impact on the continuity of the customer relationship. The graduating logistics professional should be familiar with the producing of different strategies, such as pricing strategy and company strategy, in order to understand the supply chain entity.

Sustainable development in the ESLogC project has less to do with environmental issues but more with work safety and security, work environment, work well-being, responsible use of machinery, economical driving and ethical purchasing and sales. Sustainable development was present in the examined degree programmes to varying degrees. Other programmes had included whole study entities in sustainable development in their curricula but there were programmes that had very few or none study module titles suggesting to sustainability. Social responsibility and sustainable development in general should be a compulsory component in all degree programmes in Universities of Applied Sciences. The matters included in sustainability could be implemented into already existing study modules, for instance a part of Transport study module could consist of green transportation issues et cetera. Another way would be to benchmark the degree programmes that have created sustainable development study entities and create one's own on that basis.

More generally, degree programme structure and teaching related development proposals concern the degree programme objectives and different, student and business friendly teaching methods. The competence charts, presented in part 1 in this publication, collect together each occupational group's future competences. These competences could be implemented in the degree programmes study module objectives, for instance purchasing study module objectives could consist of purchaser's competence chart's main competences. In the same way, it would be advisable to change all study modules' objectives competence based on which would facilitate the students'

learning progress, when they would know what the competence goal of the course is. Study methods should change according to the business life. Many students work or have other obligations besides school. Online courses are current today and education should be made possible even to the people who do not have the time to sit several hours per day at the university. Logistics is something one learns largely by doing. Therefore mile-long slideshows of different logistics strategy theories perhaps do not end up with the desired result. Various logistics strategy games are becoming increasingly popular and as the teachers utilize them, they see the better results the students achieve. More importantly, students get the overall picture of the supply chain and the different operations affecting each other when they can experience the realistic functions, make decisions and see the outcomes when something goes wrong. Cooperation with guest lecturers and local businesses is always important, especially in logistics field. The business representatives can give a true, current, hands-on view of the logistics business at the moment and of the future trends which the university lecturers cannot do when they do not work in logistics business environment.

Educational planners could study and review the occupational competence charts created in the ESLogC project and assess and develop their own logistics education by the competences demanded of logistics professions. The competence charts represent the views of almost a thousand logistics operators from different companies who perhaps have the clearest hands-on approach to the logistics competence. The competence charts are presented at the end of this publication. Keeping in mind what has been mentioned, it is recommended educational planners and head lecturers listen to the company representatives' opinions, revise the aims and objectives of their degree programmes and modify the contents of their curricula in a way that the competence demands in the competence charts would be fulfilled. The contents of the charts can also be utilized in the planning of individual study modules. The companies that the ESLogC project group has cooperated with either in the making of the competence charts or in the competence assessment survey have found the charts very useful in recruiting situations and job interviews and several companies have already started to use the charts as recruiting tools when mapping the applicants' competence. Therefore it is important to notice, that the graduating student can gain significant advantage if the competence needed is already acknowledged and partially mastered already in the application stage. Additionally, it is easier for the student to follow his/her own learning progress by means of competence areas mastered in the competence charts.

Appendix I Logistics education in Finnish universities of applied sciences in 2012

Arcada University of Applied Sciences	Degree Programme in Business Economics, Business Logistics orientation studies (Swe)
Haaga-Helia University of Applied Sciences	Degree Programme in Business Economics, International Business and Logistics orientation studies (Fin)
HAMK University of Applied Sciences	Degree Programme in Supply Chain Management (Eng)
	Degree Programme in Machine and Production Technology (Fin)
	Degree Programme in Traffic (Fin)
Jyväskylä University of Applied Sciences	Degree Programme in Logistics (Fin)
	Degree Programme in Machine and Production Technology (Fin)
	Degree Programme in Logistics Engineering (Eng)
Kajaani University of Applied Sciences	Degree Programme in Logistics (Fin)
	Master Degree Programme in Logistics (Fin)
Kemi-Tornio University of Applied Sciences	Degree Programme in Machine and Production Technology (Fin)
	Degree Programme in Business Economics, Logistics orientation studies (Fin)
Central Ostrobothnia University of Applied Sciences	Degree Programme in Industrial Management (Fin)
	Degree Programme in Machine and Production Technology (Fin)
Kymenlaakso University of Applied Sciences	Degree Programme in Business Logistics (Fin)
	Degree Programme in Logistics (Fin)
Lahti University of Applied Sciences	Degree Programme in Machine and Production Technology (Fin)
	Degree Programme in Business Logistics (Fin)
Laurea University of Applied Sciences	Degree Programme in Business Economics, Logistics orientation studies (Fin)
Metropolia University of Applied Sciences	Degree Programme in Traffic and Transport Management (Fin)
	Degree Programme in International Business and Logistics (Eng)
	Master Degree Programme in Procurement (Fin)
	Degree Programme in Machine and Production Technology (Fin)
Oulu University of Applied Sciences	Degree Programme in Industrial Management (Fin)
	Degree Programme in Machine and Production Technology (Fin)
North Karelia University of Applied Sciences	Degree Programme in Machine and Production Technology (Fin)
Saimaa University of Applied Sciences	Degree Programme in Machine and Production Technology (Fin)
Satakunta University of Applied Sciences	Degree Programme in International Business and Marketing Logistics (Eng)
	Degree Programme in International Business, Business Logistics orientation studies (Fin)
	Degree Programme in Machine and Production Technology (Fin)
	Degree Programme in Logistics (Fin)
Savonia University of Applied Sciences	Degree Programme in Industrial Management (Fin)
	Degree Programme in Machine and Production Technology (Fin)
Seinäjoki University of Applied Sciences	Degree Programme in Industrial Management (Fin)
	Degree Programme in Machine and Production Technology (Fin)
Tampere University of Applied Sciences	Degree Programme in Traffic and Transport Management (Fin)
	Degree Programme in Machine and Production Technology (Fin)
Turku University of Applied Sciences	Degree Programme in Traffic and Transport Management (Fin)
	Degree Programme in Machine and Production Technology (Fin)
	Degree Programme in Business Logistics (Fin)
	Degree Programme in Industrial Management (Fin)
Vaasa University of Applied Sciences	Degree Programme in Machine and Production Technology (Fin)
Novia University of Applied Sciences	Degree Programme in Machine and Production Technology (Swe)
	Degree Programme in Industrial Management (Swe)

Introduction

This article is a summary of the vocational degrees in logistics that are provided in Finland. It was drawn up as an extension to the ESLogC project's two previous articles: Evaluation of Preparedness to Future Competence (Siven 2011) and Evaluation of Future Competence in Relation to Current Competence (Suomäki 2011). These articles analyzed the current competence level of the personnel employed by logistics companies in Southern Finland. In Siven's article, professional competence was evaluated using the results of a survey sent to different staff groups. In Suomäki's article the results of the survey were analyzed in terms of the competence demands for future logistics centers determined by logistics professionals.

Six occupational groups in logistics companies were defined: the management of logistics, warehouse superiors, warehouse workers, forwarders, purchasers, customer service and sales. Siven's article emphasized the occupational groups' level of education, contemporary competence and how to prepare for the future competence needs. Whereas Suomäki compares the occupational groups' present competence with the future competence requirements defined by logistics professionals in 2010 within the ESLogC project. This article examines the vocational degree programmes in logistics with reference to the information given in Siven's and Suomäki's articles.

Logistics Degree Programs in Vocational Institutions in Finland

According to the definition by the European Logistics Association, logistics means the organizing and planning of material flow and the information and capital flows related to it, supervision and realization from the suppliers, from planning and from buying to a final customer, so that it satisfies the market's needs through production and distribution with as low costs as possible. (von Bach & al. 2000. 152-153.) With reference to this definition, six training programmes out of three degree fields were chosen for the analysis of the vocational degrees in logistics.

Basic degrees in logistics:

- The degree programme in Transport services where one graduates as a chauffeur, as a bus driver or as a truck driver
- The training programme in Airport services where one graduates as an airport maintenance man
- The training programme in Warehouse services where one graduates as a warehouse worker

Basic degree in seafaring:

- Training programme in Deck officers where one graduates as a watch navigating officer

Basic degree in business:

- Training program in Customer service and sales where one graduates with a Vocational Qualification in Business and Administration
- Training programme in Finance services and office services where one graduates with a Vocational Qualification in Business and Administration

In Finland, there are 41 vocational institutions offering degree programmes in logistics. All degree programmes are basic degrees in logistics, seafaring or business that mostly take 3 years to complete, with 120 credits. The vocational institutions also include one upper secondary school offering five modules in logistics. Warehouse worker diplomas in the degree programme of Warehouse services are offered in ten educational institutions around Finland. The degree programme in Transport services is included in the curriculum of 36 educational institutions. The degree programme in Airport services is currently provided in two vocational institutions in Finland. The Deck Officer's degree included in the basic degree of Seafaring is also included in the curriculums of two educational institutions. The degree programmes leading to a Vocational Qualification in Business and Administration can be completed through two optional training programmes. The degree in Customer service and Sales can be accomplished in 30 different vocational institutions in Finland. The degree in Finance services and office services is offered by 27 institutions.

The vocational degree programmes in logistics, business and seafaring defined by the Finnish National Board of Education can be found on their website (www.oph.fi/english). The educational institution specific training programmes are mainly based inside the frame of reference defined by the Finnish National Board of Education. The content descriptions of different training programs have been informed in the very vague or condensed form on the Internet sites of some educational institutions.

Vocational Institutions Offering Logistics Degrees in Finland:

- Etelä-Kymenlaakso Vocational College (EKAMI)
- Federation of Education in Central Ostrobothnia (KPEDU)
- Forssa Vocational Institute (FAI)
- Haapajärvi Vocational College (HAI)
- Heltech - Helsinki City College of Technology
- Hyria Education
- Jyväskylä Vocational College
- Jämsä Vocational College
- Järviseu tu Vocational Institute (JAMI)
- Kainuu Vocational Institute
- Keuda Vocational College
- Kouvola Region Vocational College (KSAO)
- Loimaa Vocational and Adult College

- Luovi Vocational College
- Mercuria Business College
- Nivala Vocational College (NAO)
- North Karelia College
- Oulu Vocational College
- Pirkanmaa Vocational College (PIRKO)
- Porvoo Vocational College (AMISTO)
- Salo Vocational College
- Salpaus Further Education
- Satakunta Vocational College (SATAEDU)
- Savo Vocational College
- Savonlinna Vocational and Adult College (SAMI)
- South Karelia Vocational College
- South Savo Vocational College (ESEDU)
- Tampere College
- Tavastia Vocational College
- The Lapland Vocational College
- The Upper secondary school of Vuosaari
- The Vocational College Lappia
- The Vocational Education Institute of Northern Central Finland (POKE)
- TTS – Work Efficiency Institute
- Turku Vocational Institute (TAI)
- Uusikaupunki Vocational and Adult College (NOVIDO)
- Vantaa Vocational College Varia
- WinNova
- Vocational College of Western Uusimaa (LUKSIA)
- Vocational Education Centre Sedu
- Ylä-Savo Vocational College

Survey on Future Professional Competence

As mentioned earlier in this article, the ESLogC project implemented a survey on Future Professional Competence directed at different occupational groups. The competence requirements for the future were evaluated by using a 5-step scale:

1. One knows how to act according to guidance and utilize the skills and knowledge learned.
2. One knows how to apply one’s knowledge and skills, but needs support and control at times.
3. One can work independently, draw up plans and see what is important.
4. One knows how to use information and skills in new situations and is capable of developing the operation.
5. One knows how to utilize objective information for development and can teach/direct others.

The summary of the results of this survey was mentioned earlier in the articles: Evaluation of Preparedness to Future Competence (Siven 2011) and Evaluation of Future Competence in relation to Current Competence (Suomäki 2011). The competence requirements for future logistics defined by logistics professionals are demonstrated in the table 1.

Table 1. Logistics future competence demands

Supply Chain Management	Operations Planning	IT Operated Operations Measurement, Development, Follow-up and Assessment	Competence Management	Cooperation
Familiarity with company processes	Layout planning	Systematic measuring of operations	Motivation	Networking
Economic impacts	Process planning	Collection and utilization of correct information	Competence demands caused by legislation	Competence demands caused by internationalization
Understanding of own role	Environmental consciousness	Indicators for cost-effective follow-up	Communication skills	
Process management	Organization	Development of data systems	Engouragement	
			Work community skills	
			Project management	

The summary of Siven's report is presented in table 2. The current competence and the future challenges are listed according the different vocational degrees in logistics. The columns represent the different focuses for further developing competence. The requirements for future competence are briefly clarified in terms of different variables.

Table 2. Occupational group specific competence and the future challenges

	Competence	Competence development focuses	Competence demand trends
Logistics management and planning	Weaknesses:	active market follow-up and anticipation	sustainable development solutions and environmental issues
	sustainable development	claim handling	cost increase
	handling the claims	quality control	competition
	Strengths:	sustainable development	safety requirements
	Development of logistics solutions according to the company strategy	strategy and strategy led competence	productivity
	personal skills	communication	energy costs
		management of internal and external customer and stakeholder networks.	
	familiarization with the best practice - models and their customization to own business environment		
	increase of the personnel development competence		
Warehouse superiors	Weaknesses:	technology competence	sustainable development
	sustainable development	sustainable development	multiculturalism
	language skills	recruiting	processes
	Strengths:	silent competence	operations measurement
	Communication and personal skills	interaction	warehouse layout
	Planning, assessing and guiding the personnel functions and competence at own responsibility area	project competence	value creation
	Work safety	work well-being	legislation
		educational needs based on quiet signals	
		communication	
		understanding entities	
	age management		
Warehouse workers	Weaknesses:	utilization of warehouse management systems	development of working methods
	Customer and stakeholder relations	new technologies	technology
		processes	environmental issues and catastrophes
	Delivery process tasks	product and service knowledge	work community and cooperative skills
		networking and cooperation competence	
		information sharing	
	Strengths:	quality control and follow-up	
		competence development	
Goods collection process tasks	sustainable development		
	personalizing and utilizing development conversations		
	enhancing customer relations competence		

Conclusions

It is very challenging to compare logistics competence demands with the degree programme curriculums the more exact when the content descriptions are missing. This report compared future competence requirements with the present curriculums of vocational institutions offering logistics degrees. The specific competence requirements that are currently not met by any vocational institution have been indicated as subjects for development in the logistics curriculum.

However, the principles of sustainable development must be emphasized because the ecological efficiency and recycling are not beneficial only for the companies, but for social, economical and the ecological environment as well. Sustainable development was mentioned as a concept in several educational institutions' curriculum but there has not been a profound discussion of the topic. Nonetheless, sustainable development is a significant future trend in logistics. Generally the for logistics competence requirements are well covered in the present logistics curriculums.

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Supply of further education in logistics was mapped during summer and autumn in 2010, based on a report made by Harri Pohjalainen. The supply of further education is difficult to inspect because the supply of courses changes with short cycles and information is not offered from one specific source. In addition, defining the search criteria in logistics for some courses, which could be suitable also for logistics, has been limited. In the survey of further education the course supply from commercial enterprises operating in South-Finland were taken into account. In this publication, the supply of further education is viewed from a quantitative point-of-view and from six main personnel groups' point-of-view; logistics management and planning, warehouse supervisors, warehouse workers, forwarders, purchasers and customer service and sales. In the end, there were 166 logistics related courses in the analyzed material. When course supply is viewed from the personnel groups' point-of-view it decreased to 98 courses. Quantitatively most courses were offered by AEL (39).

Further Education in Logistics

Further education in logistics was divided into two groups; transportation together with logistics and purchase. In transportation and logistics there were 12 education providers at the time of examination and they offered 111 different courses. AEL was quantitatively the largest provider with 39 courses. Sykli and GLi-Companies are offering 20 courses. The three largest providers were offering 79 courses from 111. The supply from AEL contains courses for drivers, warehouse workers, warehouse supervisors, forwarders and purchasers. Training methods are e.g. preparatory training, further education, seminars, examinations and group works/workshops. Courses from Sykli and GLi-Companies are mainly targeted for drivers and training methods are preparatory and further education. From course supply offered by Logisteam there are nine courses targeted for logistics and warehousing and a few for drivers. The main training methods are preparatory and further education. Six courses provided by Rastor are targeted to warehouse workers and warehouse supervisors. The most used training methods are preparatory training and examinations. LOGY Competence Ltd. offers five courses for warehouse workers and supervisors and their training methods are further education, group works/workshops and seminars. The Institute of Marketing offers four courses; two are targeted at transportation and warehouse operations and two others are focused on material operations, leading to a degree.

For education targeted for procurements, AEL offers largest education supply (16 courses). The second largest provider is LOGY Competence Ltd. with 15 courses and the third, TKK Dipoli, with 9 courses. AEL provides courses in quality management of procurements, custom clearance and forwarding, customer service and warehousing and controlling dynamic availability. Training methods differ depending on the course; mostly used are preparatory and further education, seminars, examinations or group work/workshops. Logy is providing following courses; legislation in logistics, management and development of supply chain, leading and developing purchases and basics of import trade. Training methods are the same as mentioned with AEL.

Courses which ТКК Dipoli offers are e.g. management of purchases and adding efficiency in supply chain by planning and predicting demand. Courses are preparatory education, further education or seminars. The fourth largest education supply is in The Institute of Marketing's supply. They offer education in planning exporting trade together with purchase negotiations and the used training methods are preparatory education or an examination.

Medium-Term Plan of Requisition and In-Service Training in Logistics

In the field of logistics, the purpose of the medium-term plan of requisition and in-service training is to find out strengths and weaknesses in knowledge and education offered for different personnel groups. The main factors under specific examination have been different megatrends, which are defining needs of specific knowledge in future. When comparing already existing knowledge and offered education it will be possible to create an image about possibilities created by knowledge and threads created by a lack of knowledge. Distribution of knowledge, together with existing education cleared from the survey, has worked as a basis for analysis in the field of strengths and weaknesses in future. When there are already knowledge and education, a certain field is considered strength, and if there is a lack of education together with a lack of knowledge, a certain field will be considered a threat. The tool used to create analysis has been an 8-field-SWOT. With that useful tool we have been able to find out the relationship between internal strengths and weaknesses with external possibilities and threads. When analyzing results and education certain approaches have been discovered that could be used to develop education to cover all the needs different groups of personnel have.

Warehouse Supervision

When concentrating on strengths of warehouse supervisors', personal knowledge and workplace skills are amplified (table 1). Educational opportunities underline the importance of already existing knowledge and with different advanced courses it is possible to achieve stability and increase knowledge and workmanship. Maintaining personal skills should be covered by education also in the future. These personal skills are e.g. language skills and cultural knowledge and the ability to maintain operational actions together with cost-effective technical resources and supply-chain. These areas should be covered to make sure organizations could maintain their success.

Sustainable development together with customer and stakeholder relationships are amplified because of the deficiency of education in the warehouse supervision personnel group (table 1). By education in language- and cultural skills it will be possible to cover the needs warehouse supervisors have in the field of cultural knowledge. This area is also where training providers should concentrate, invest and develop their service. Education in inventory management (planning, implementation, tracking and development) should concentrate on education of cost-effective supply-chains and quality management in a way that also covers principles of sustainable development (table 1).

The lack of education in IT-education as well as in the field of sustainable development should be replaced and strengthened by internal education within the organization. This should be done by sharing the already existing knowledge and skills with different levels of organization and also co-operation with different departments (table 1). Training providers could cover this educational area by offering courses about internal education which will train companies to share their knowledge and know-how. Therefore, already existing IT-skills as a tool can be used for internal education when operations are changing more automated and information technology is developing.

Lack of education in sustainable development and IT-sustainability for warehouse supervisors together with a lack of knowledge are causing possible crisis if these areas are not taken into consideration (table 1). In this situation, where needs of education have been neglected, developing organizations in a way that (changing) megatrends require, is not possible. The main areas to develop in the field of education should then be sustainable development education for logistics managers. By this, organizations are able to anticipate and prevent possible crises.

Table 1: Warehouse supervisors' 8-field-SWOT.

EXTERNAL FUTURE	INTERNAL CURRENT	INTERNAL STRENGTHS	INTERNAL WEAKNESSES
		Shows general workplace skills Shows personal skills Knows how to predict, plan and evaluate actions and take care of technical resources Knows how to plan, lead, evaluate and develop personnel's actions in his/hers responsibility area	Knows how to take principles of sustainable development into account Knows how to predict, implement, follow and develop warehouses operations Knows how to manage and develop customer and stakeholder relationships Knows how to plan, implement and follow quality management
EXTERNAL OPPORTUNITIES		SUCCESS FACTORS	WEAKNESSES TO STRENGTHS
Language and cultural knowledge Role in supply chain Cost-effective supply chain Quality management Tacit knowledge Project works		Amplifying personal skills Cost-effective operations and technical resources Language and cultural knowledge as a strength Work placement skills	Language and cultural education as a part of customer and stakeholder relationships Amplifying tacit knowledge and quality management and making them visible Education of cost-effective supply chain as a part of warehousing
EXTERNAL THREATS		THREATS TO STRENGTHS	CRISIS SITUATIONS
Sustainable development Automation of actions Technical readiness		Approaching sustainable development via personal knowledge Current technical knowledge should be exploited when operations are changing more automated and technology is developing	Failure of sustainable development Warehousing is not sustainable in technical way Customer and stakeholder relationships are not sustainable level when viewed from technical point-of-view

Warehouse Workers

When concentrating on strengths of warehouse workers, possibilities in technical knowledge of processes and personal work are amplified (table 2). In the field of education, organizations should concentrate on possibilities and changes caused by information technology and technical development. In addition, sustainable develop-

ment (uniquely from other personnel groups) is one of the major regional strengths. It should be developed by education in a way where warehouse workers are able to share their knowledge around the company to help organizations to follow principles of sustainable development strategies.

Know-how of warehouse workers should be developed towards more intelligent and technical systems. This will highlight the importance of data processing (table 2). With education it should be possible for warehouse workers to work in an organization where producing and warehouse processes are integrated and supporting producing processes by technical devices and systems is necessary. Underlining the principles of sustainable development in the field of developing transportation supports warehouse workers to be a part of the integration between production and transmission processes (table 2)

The development of technology and increasing importance of energy efficiency together with the economy are highlighting the importance of personal IT-skills in warehouse workers' personnel group. By sharing the existing knowledge together with education it could be possible to change know-how from sustainable warehouse knowledge towards sustainable and developing technical education.

Major problems would appear if an organization neglects the needs of education in the field of inventory management as well as in the field of technical development in production and transmission processes (table2). Crisis situations for warehouse workers could then be named failure in technical development and also energy inefficiency when there is not specific education offered.

Table 2: Warehouse workers' 8-field-SWOT.

INTERNAL CURRENT EXTERNAL FUTURE	INTERNAL STRENGTHS	INTERNAL WEAKNESSES
	Shows general workplace skills Shows personal skills Knows collection process Knows how to take principles of sustainable development into account	Knows transmission process Knows how to support different steps of production process Knows how to manage and develop customer and stakeholder relationships
EXTERNAL OPPORTUNITIES	SUCCESS FACTORS	WEAKNESSES TO STRENGTHS
Developing transportation IT Data processing	Technical knowledge about processes Personal IT-knowledge Principles of sustainable development in transportation	Education of technical systems and knowledge Education of developing transportation in production and transmission processes Education and developing of data processing towards integration of production and warehousing
EXTERNAL THREATS	THREATS TO STRENGTHS	CRISIS SITUATIONS
Developing technology Energy efficiency and economy	Internal IT-knowledge to support developing technology Taking principles of sustainable development as a part of energy efficient and economical education	Latest developing technologies and knowledge in warehouse management Knowing developed technologies in production and transmission processes Energy inefficiency in processes

Logistics Management and Planning

When planning education for logistics management and planning, already existing knowledge and success in the field of logistics solutions and planning combined with development should be underlined. Education should be targeted towards the field of green logistics and global costs of development (table 3). Special knowledge should also be underlined by sharing existing know-how with other personnel groups. When developing education a focus should be on maintaining the existing know-how and education of sharing the knowledge.

The importance of green logistics and disappearance of tacit knowledge are amplified as progressing trends (table 3). In this situation the education of logistics management and planning should be concentrated on sharing already existing knowledge. By this it should also be possible to make existing know-how a part of organizations' quality management processes. In management and planning the knowledge of sustainable development should be underlined via education of green logistics. Knowledge and know-how of customer and stakeholder relationships could be highlighted by the education of buying-know-how and "push-to-pull" education (table 3).

Because of the emphasis of alternative energy solutions in the future, logistics management and planning of internal education should concentrate on the development of regional strengths. This kind of development and education should happen when contemplating logistics solutions from the view of alternative energy solutions and sustainable development (table 3). Also existing IT-knowledge should be developed by internal education so that when actions are going more automated organizations are able to respond to the changes.

By failures of language and cultural education it could be possible that the major crisis in logistics management and planning personnel group could be problems caused by the lack of maintenance of customer and stakeholder relationships. Also failures of sustainable development education will cause challenges for logistics management and planning (table 3). While logistics is becoming more automated and technology is developing, failure of education will cause a crisis situation and prevention of these problems should happen inside the organization by internal education and sharing the existing knowledge (table 3).

Table 3: 8-field-SWOT of logistics management and planning

EXTERNAL FUTURE	INTERNAL CURRENT	INTERNAL STRENGTHS	INTERNAL WEAKNESSES
		Knows how to create logistics solutions following organizations' strategy Knows how to plan, lead, evaluate and develop operations and economy of his/hers own field Knows how to plan, lead, evaluate and develop skills of his/hers own personnel Shows general workplace skills Shows personal skills	Knows how to plan, implement and follow quality management Knows how to take principles of sustainable development into account Knows how to manage and develop customer and stakeholder relationships
EXTERNAL OPPORTUNITIES		SUCCESS FACTORS	WEAKNESSES TO STRENGTHS
Green logistics Tacit knowledge Push – to – pull Purchase knowledge RFID Global development of costs		Developing solutions for green logistics Developing and planning operations and skills of personnel and unit Sharing the personal knowledge of managers to other employees	Adding tacit knowledge as a part of quality management Using green logistics to achieve knowledge about sustainable development Develop knowledge about customer and stakeholder relationships
EXTERNAL THREATS		THREATS TO STRENGTHS	CRISIS SITUATIONS
Optional energy solutions Sustainable development Warehouse and logistics operations change more automated Language and cultural knowledge		Viewing logistics solutions from sustainable developments and energy solutions point of view Planning operations towards more automated and technical direction Personal language and cultural skills	Due to weak language and cultural knowledge there's problems in the field of customer and stakeholders' relationships management Failure in sustainable development Weak quality management when warehouse and logistics operations together with order shipments are automated

Purchasers

Operative knowledge is amplified as an area of expertise of purchasers and this should be highlighted also in education. Other areas of expertise should also be increased by IT-education and law/safety education (table 4). Education should concentrate on the personal level of IT-knowledge and knowledge about global environment perspectives. Education package developed with these guidelines should make it possible for organizations to maintain their success in the future.

The education of purchasers' organizations should also concentrate on internal education of internal strategies. In this way, the purchaser could be able to implement, evaluate and develop organizations procurement policy (table 4). Companies could be trained to use internal education in a way that existing knowledge could be possible to share elsewhere inside the organization. Education of supplier markets should especially concentrated on knowledge of global supplier markets and environmental perspectives should be lifted as a part of operative actions in education.

Maintenance and development of cost-effective supply chain should be taken into account inside the organization. This, together with internal education, would make it possible to keep the knowledge inside the company and also ensure stability of development (table 4). Among these areas, education should also be developed to serve changing needs of organizations. Underlining the operative knowledge would help purchaser to understand growth in needs of investments and decrease of productivity and by this help them to create predictions.

Major crises in the purchaser personnel group appear if personal welfare of employees or education in prediction making fails. These areas should be taken into account also when developing education in future (table 4). If procurement policy fails it's possible that cost-effectiveness decreases and resources are insufficient to develop operative knowledge. In this point also management of finance and personnel decreases. Organizations should focus their education on increasing know-how and ability to predict and recognize external costs and demand.

Table 4: Purchasers' 8-field-SWOT

INTERNAL CURRENT EXTERNAL FUTURE	INTERNAL STRENGTHS	INTERNAL WEAKNESSES
EXTERNAL OPPORTUNITIES	SUCCESS FACTORS	WEAKNESSES TO STRENGTHS
EXTERNAL THREATS	THREATS TO STRENGTHS	CRISIS SITUATIONS
Environmental aspects Operative knowledge Internal education Legislation and changes in safety instructions Globality IT Skilled personnel Language and cultural knowledge	Operative tasks of purchasing Personal language and cultural knowledge together with technical knowledge Developing product and warehousing management together with noticing changes in legislation and safety instructions Developing supply chain with principles of global environmental values	Internal strategy training Training and knowledge of global supplier markets and Taking environmental aspects as a part of operations Constant training of personnel in buyers job
Supply and demand Downsifting Growth of investment needs and drop of productivity	Development of management of cost-effective supply chain Caring and developing personnel's personal skills Developing operational skills	Personnel's well-being in work life Failure in prediction/knowledge of changes in external demand/costs --> failure in purchasing policy Units operative actions are not handled in investments', economy's or personnel's point of view

Forwarders

The major strengths in forwarders personnel group are possibilities offered by import and forwarding technology. Stability of knowledge is one major area to achieve by education (table 5). Also major strength in IT-knowledge should be underlined when developing education in a way where it could cover ever changing technical prerequisites. Importance of customer and stakeholder relationships will amplify in future and these areas should strengthen either by education or sharing knowledge amongst the organization. Maintaining personal knowledge and workplace skills will amplify as strength in future if employees' satisfaction and personal welfare can be maintained at the same level.

Learning how to make sustainable solutions in economy and technology is a major part in developing education (table 5). E-communication and IT-knowledge are improved also in the field of customer service and because of that, education should be developed towards more computer-based communication. This also means that relationships to principals and controlling their advantages are enlarged and developed.

Major needs of development in education, which could be covered by internal education, increase recognition and are exerted on forwarders work. This should happen by internal education together with co-operation with stake holders (table 5). However, failure in the above areas could mean that companies would not find skilled labor. In addition, personal language and cultural skills should not be neglect because markets are becoming more global and it is important that labor is skilled also outside of its strength of regional areas.

Major crises would then be a failure in language and cultural knowledge and their effect on importing, together with controlling the advantages of principals. If work of forwarders were not made visible outside the industry, it would also cause problems to find skilled labor.

Table 5: Forwarders' 8-field-SWOT

EXTERNAL FUTURE	INTERNAL CURRENT	INTERNAL STRENGTHS	INTERNAL WEAKNESSES
		<ul style="list-style-type: none"> Knows how to manage and develop customer and stakeholder relationships Shows workplace skills Shows personal skills Knows how to handle forwarding assignments Knows how to handle import shipments 	<ul style="list-style-type: none"> Knows how to handle export shipments Knows how to ensure principals advantages Knows how to handle financial management Knows how to take principles of sustainable development into account in his/hers own job
EXTERNAL OPPORTUNITIES		SUCCESS FACTORS	WEAKNESSES TO STRENGTHS
<ul style="list-style-type: none"> Development of technology Customer service Electrical data management tools Tacit knowledge 		<ul style="list-style-type: none"> Possibilities provided by technology of importing and forwarding Maintaining and developing customer and stakeholder relationships Personal IT-skills and basic working skills 	<ul style="list-style-type: none"> Sustainable solutions in the fields of financial management and developing of technical communication Developing electrical communication and co-operation between customer service and principals Information about good practices
EXTERNAL THREATS		THREATS TO STRENGTHS	CRISIS SITUATIONS
<ul style="list-style-type: none"> Language skills Fame and recognition of the industry 		<ul style="list-style-type: none"> Increasing fame and recognition of the industry with the help of stakeholders Making forwarder agents' job more visible Amplifying personal language and cultural knowledge 	<ul style="list-style-type: none"> Effects of lack of language and cultural knowledge in export shipments and ensurement of principals' advantages Lack of skilled personnel

Customer Service and Sales

When analyzing the fields of know-how in customer service and sales technical skills and the importance of intelligent systems are amplified. Making intelligent systems as a part of sales management, services and customer management maintain the existing knowledge required. With education, personal IT-skills could be transformed to system knowledge in future. Knowledge about systems and IT-skills are also going to amplify in the field of customer and stakeholder relationships in future (table 6).

Already existing education should be concentrated especially to the fields of order-delivery processes and development of operations to make sure the level of knowledge could be maintained at the same level (table 6). Understanding and education of supply and demand as a part of ITC-knowledge will strengthen in future and by education know-how of these areas should be amplified and operations should be integrated. When observing principles of sustainable development, organizations should concentrate on sharing the existing knowledge elsewhere inside the company.

The importance of education and development of global value networks should be augmented in companies' internal education. Because of lack of education, companies should begin co-operation with their stakeholders to make sure that more and more important global values and ways of action remained secondary (table 6). To complement anticipation of user needs and co-operation with public and private sector, companies should add sales, service and customer management to the above areas. By this development of both areas could be possible within the internal resources companies have.

If companies forget their global values, a major crisis could appear in order-delivery processes and in the field of developing transportation (table 6). Lack of innovations would also affect anticipation of user needs in the field of supply and demand and developing personnel is amplified to avoid these crisis situations. In addition to the above areas, anticipation of principles in sustainable development amplifies and if there is failure, it will create a critical crisis in future.

Table 6: 8-field-SWOT of customer service and sales

EXTERNAL FUTURE	INTERNAL CURRENT	INTERNAL STRENGTHS	INTERNAL WEAKNESSES
		Knows pricing of products and services and can make sales-, transportation and project contracts Knows management of sales, services and customers and actions of After Sales Knows how to manage and develop customer and stakeholder relationships Shows general workplace skills Shows personal skills	Knows how to predict and manage supply and demand and make pricing strategies Knows order-delivery processes and how to create personal products for customer Knows principles of sustainable development Knows how to plan, lead, evaluate and develop skills of his/hers own personnel Knows how to plan, lead, evaluate and develop operations and economy of his/hers own field
EXTERNAL OPPORTUNITIES		SUCCESS FACTORS	WEAKNESSES TO STRENGTHS
ICT / IT –skills Intelligent systems and technologies Communication		Intelligent systems as a part of management in sales, services and customers Communication between customers and stakeholders Personal ICT/IT-skills	Communication and intelligent systems as a part of order-delivery processes and in development of operations Supply and demand as a part of ICT-skills and strengthening internal communication Sharing most important principles of sustainable development
EXTERNAL THREATS		THREATS TO STRENGTHS	CRISIS SITUATIONS
Global value networks Co-operation with public and private sector Prediction of user needs Innovations Developed transportation		Exploit customer and stakeholder relationships in global value networks Management of sales, services and customers as a part of prediction of user needs and also in co-operation with private and public sector Amplifying personal skills in innovations Knowing in pricing and contracts as a part of developing transportation	Global values of order-delivery processes and challenges of developing transportation Failure in prediction of supply and demand Lack of innovations in personal work Failure in principles of sustainable development between public and private sector

Jorma Härkönen

SUPPORTING THE COMPETITIVE ABILITY OF LOGISTICS IN FINLAND WITH THE HELP OF ESLogC

ESLogC – “Development of the Logistics Center System in Southern Finland” has been an ERDF-funded venture and the first of its kind in Finland. The main targets were to collect information about the present and future logistics centers and to build future scenarios in order to help companies to make plans and decisions concerning their own logistics. The venture aimed at gathering logistics center knowledge with the help of modern web-based tool, building a model of recent location development and future scenarios as well as comparing ecological and sustainability perspectives with the current development projects. Competence assessments and making the guidelines of the competence management in logistics centers have been core activities of the whole venture. They also have enabling the guidelines for the public education presented in the WP 3 results.

The latter themes under the Work Package 3 are an integral and very important part of the new knowledge base. The three Universities of Applied Sciences led by LAMK have been particularly successful in involving several tens of companies to this work. The fact that so many companies were ready to take part in the pragmatic steps of the project, underlines the importance of the whole matter itself. The companies are worried about the availability and quality of the workforce in this area the future. On the other hand, as the WP 3 project proves, the companies are ready to take good care of the training of their employees.

The work descriptions are in considerable change in warehouse and logistics center environments. The employees nowadays in many cases have to be multi skilled, technically advanced and able to understand and speak at least English language. This description is indeed quite different from the traditional image of a warehouse worker. The results of this Work Package clearly underline these changes. The big challenge for the whole industry is to get the students and youngsters who consider their careers to understand this fact as well.

For the education development, the three participating Universities of Applied Sciences published a skill chart for the “Logistics Center of the Future” as a result from their covering work with 35 companies. Further on, several publications about the outcome of the WP3 were published, this one being one of them. They will be benefited by the developers, educational institutes and companies alike for several years to come. The results of these studies can and should be used as guidelines when planning the logistics education in this particular field.

The complete ESLogC-venture started in October 2009, and lasted until September 2012. The Program was coordinated by Technology Center TechVilla in Hyvinkää in Southern Finland and it included five partners. TechVilla had the responsibility for tendering and coordinating operations between the fourteen consultancy projects.

In order to transform the complete, huge information package into a usable format, the venture produced an internet-based desktop called “Logistics Center Developer’s Virtual Desktop”. The results are published in a user-friendly, “info card” format in

this desktop. The readers and developers who want to go deeper in the project details in some specific areas can use the links given under each topic.

All in all, the venture will offer a new, extensive knowledge base on the development of the logistics centers in Southern Finland. It will provide with many interesting future scenarios, which hopefully can be evaluated and utilized also in other EU-countries. One further perspective is to provide information about the logistics center development in Finland for international investors and networking operators.

This is a one big step forward in the analysis and development of modern logistics nodes in Finland. Further study and co-operation is still necessarily needed. The whole development is closely connected to the trends and megatrends of international trade and logistics. International networking and benchmarking are elementary and continuous parts of this future work.

As the co-coordinator and initiator of the venture, I want to thank Lahti University of Applied Sciences, Laurea University of Applied Sciences and HAMK University of Applied Universities of excellent work done in this project. The results will be used widely for the benefit of the Finnish logistics sector development.

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APPENDICES

Appendix I Professional group based competence charts

I) Logistics Management and Planning								
Competence areas		1	2	3	4	5	6	7
A	Can develop logistics solutions according to company's strategy	Participates in strategic definition process and creates strategic objectives accordingly	Draws up organization action plan according to firm strategy and launches it	Participates in development of internal production and warehouse logistics	Plans, develops and follows up goods flows in cooperation with different organizations	Answers for logistics practice launching and acts as consultant		
B	Can plan, guide, evaluate and develop operations and economy in own area of responsibility	Anticipates and follows market developments	Plans and directs operations in own area of responsibility. Draws budget and action plans	Follows realization of budget and action plans and analyzes aberrations	Plans and secures resourcing for operations	Reports on actions' results and economy and on corrective measures to management on agreed to schedule	Evaluates and develops and secures efficiency and quality of operations. Follows latest trends in quality control and operational development	Utilizes appropriate indicators and understands their implications and content
C	Can plan, realize and follow quality control	Follows, utilizes and develops quality tools and processes. Secures remedial action	Supports and encourages workers to use and develop quality tools towards necessary ends	Applies content of quality indicators as required. Advises and trains personnel in matters of quality	Follows adoption and application of quality standards in own work as suitable to own branch	Participates in external and internal auditing	Draws up remedial measures and schedules for correcting irregularities in audits	Secures functionality of reclamations processes
D	Takes principles of sustainable development into account in his/her work duties	Answers for training subordinates in sustainable development	Draws up sustainable development measurement indicators and sees to it that remedial action is carried out	Makes investment calculations and plans for furthering sustainable development	Works in accordance with the values of sustainable development and supports personnel's sustainable development action initiatives	Answers for visibility of sustainable development measurement indicators and for the periodic updating of said indicators	Plans more energy-efficient alternatives in such as transport and storage	
E	Can maintain and enhance customer and stakeholder relations	Cooperates with internal customers and stakeholders	Cooperates with external customers and stakeholders	Cooperates with various officials such as customs officials and with laboratories	Takes care of internal and external communication regarding such matters as changes in product, operations and demands	Secures satisfaction of customers and stakeholders		
F	Can plan, direct, evaluate and develop subordinates' work and competence	Plans necessary personnel resourcing	Participates in recruiting. Familiarizes self with and takes care of guidance of new personnel	Works in accordance with legal and contractual demands	Takes care of worker safety and welfare matters	Directs and evaluates personnel actions and performance. Assesses job complexity (TVA). Carries out foreman/subordinate development discussions	Forecasts, maintains and develops personnel competences. Takes care of personnel welfare	Maintains and updates tools of management competence
G	Demonstrates interpersonal skills	Is able to work in interpersonal relations with different kinds of people in a manner conducive to duties. Works naturally in different kinds of interpersonal situations	Handles work-related documentation according to established norms. Draws up documents in linguistically correct language. Verbally expresses self clearly and understandably in a manner conducive to duties	Presents self convincingly and credibly. Familiar with basic use of most common computer programs. Acquires and forwards information using online tools. Works constructively in team and group work situations	Recognizes new potential partners and creates functional cooperative relations and networks. Manages problem situations in accordance with company norms and policies	In decision-making situations, is capable of comparing alternatives and selecting most appropriate for situation. Works flexibly and creatively. Forecasts and prevents occurrence of problem situations	Relates positively to learning and recognizes need to learn new things, create ideas, develop and experiment with alternative solutions, in both own and department work. Follows professional ethics, such as non-devulgence and obedience of consumer protection regulations	Works responsibly, fairly and according to agreements. Behaves considerately and keeps own workstation and common areas in order. Sees opportunities to enhance whole organization's positive atmosphere
H	Demonstrates personal skills	Works conscientiously and in a customer-oriented manner	Takes care of worker welfare and health	Work in accordance with laws and regulations	Follows operational system directions and company rules	Possesses project-work skills	Possesses language skills	Makes use of technology and information technology

Competence Development of Logistics Centers

2) Warehouse Supervisors								
Competence areas								
	1	2	3	4	5	6	7	
A	Can plan, realize and follow up on quality control	Takes care of quality control planning, realization and rectification	Takes care of preventative actions	Monitors quality control indicators	Advises and trains personnel in quality matters	Makes statistics for and develops storage processing towards synchronization	Examines and handles customer returns and reclamations	Follows application of branch quality standards in own operations
B	Can plan, realize, follow up and develop warehouse operations	Agrees on storage levels and goods to be stored in co-operation with production, acquisition and sales, taking product lifespan into consideration	Follows sales forecasts, realized sales and future marketing promotions	Prioritizes and plans warehouse product placement and quantities	Furtheres adoption of measures in storage management which will increase added value (for example late customer tailoring)	Recognizes, records and distributes best working methods found both within and between departments	Takes advantage, in own department operations, of improvements discovered elsewhere	Maintains product information on stored products (for official order, demands, storage/transport, handling etc etc)
C	Takes principles of sustainable development into account in his/her work duties	Plans for environmentally friendly means of operation, process and acquisition in accordance with company environment policy	Takes care of sorting and recycling and/or reuse and trains personnel in waste sorting	Constantly keeps up with region's machinery condition and reacts immediately to remedy situations of faulty equipment	Monitors storage temperatures, lighting and ventilation to ensure they remain according to recommendations	Monitors indicators so as to ensure emission, consumption and energy efficiency and make environmental reports	Seeks out reasons for measurement aberrations and trends, and takes action to remedy situation	Participates in sustainable development projects
D	Can maintain and enhance customer and stakeholder relations	Cooperates with internal customers and stakeholders	Cooperates with external customers and stakeholders	Cooperates with different officials, such as, customs, laboratories etc etc	Takes care of internal and external communication in regard to, for example, changes in product, functions or demands	Secures customer and stakeholder satisfaction and feedback throughout partner network		
E	Can plan, direct, evaluate and develop subordinates' work and competence	Plans for necessary personnel resourcing, work shifts and duties and sets objectives	In resourcing, plans for deviations in flow of goods resulting from seasonal or from irregular arrangements in transports and deliveries	Participates in recruitment. Familiarizes self with and takes care of guidance of new personnel	Works within auspices of law and contract. Takes care of worker safety and welfare. (coping with work, bonuses, recreation etc etc)	Carries out foreman/subordinate development discussions. Directs and evaluates worker performance. Evaluates warehouse worker workload. If necessary, fills in for warehouse worker	Forecasts, maintains and develops personnel competences. Takes care of personnel welfare	Maintains and updates tools of management competency
F	Can plan, guide, evaluate and develop operations and economy in own area of responsibility	Forecasts needs and opportunities in form of technical resources (equipment, application) and their efficient utilization in storage operations	Utilizes and maintains operational direction system in stock control	Plans operations and economy of own area of responsibility. Plans and secures technical resources for operations	Takes care of technical resources and their functional condition. Monitors operations key economic figures and reports on them	Is responsible for own area's upkeep of machines and equipment and acquisitions	Maintains and supervises area's neatness and order	Evaluates and develops operations. Ensures efficiency and quality
G	Demonstrates interpersonal skills	Is able to work in interpersonal relations with different kinds of people in a manner conducive to duties. Works naturally in different kinds of interpersonal situations	Handles work-related documentation according to established norms. Draws up documents in linguistically correct language. Verbally expresses self clearly and understandably in a manner conducive to duties	Presents self convincingly and credibly. Familiar with basic use of most common computer programs. Acquires and forwards information using online tools. Works constructively in team and group-work situations	Recognizes new potential partners and creates functional cooperative relations and networks. Manages problem situations in accordance with company norms and policies	In decision-making situations, is capable of comparing alternatives and selecting most appropriate for situation. Works flexibly and creatively. Forecasts and prevents occurrence of problem situations	Relates positively to learning and recognizes new things, create ideas, develop and experiment with alternative solutions, in both own and department work. Follows professional ethics, such as non-divulgence and obedience of consumer protection regulations	Works responsibly, fairly and according to agreements. Behaves considerately and keeps own workstation and common areas in order. Sees opportunities to enhance whole organization's positive atmosphere
H	Demonstrates personal skills	Works conscientiously and in a customer-oriented manner	Takes care of worker welfare and health	Work in accordance with laws and regulations	Follows operational system directions and company rules	Possesses project-work skills	Possesses language skills	Makes use of technology and information technology

3) Warehouse workers								
Competence areas		1	2	3	4	5	6	7
A	Is familiar with duties connected to receiving goods	:Directs arriving goods to correct unloading point	:Carries out inspection of arriving goods. Records irregularities and describes transport damage. Reports irregularities and damage.	:Prints place and pallet code for storage. Shelves goods according to storage control system	:Receives and takes care of customer returns. Records information into the storage control system			
B	Is familiar with duties connected to goods collection process	:Shelves goods at collection point. Inspects for missing articles.	:Supervises product quality. Follows up on and ensures collection area stock. Registers reclamations into storage control system	:Gathers customer orders. Packs them according to directions	:Wraps pallets/rollers and labels them	:Moves outgoing goods to loading platform		
C	Is familiar with duties connected to goods delivery	:Makes documents of goods being sent. Records information in storage control system.	:Orders transport	:Loads goods being sent according to transport instructions	:Surrenders goods being sent to driver. Inspects information and transport documents	:Serves customers collecting own deliveries	:Registers documents into system. Registers completed work into the storage control system.	
D	Is able to support different work phases of the production process	:Sends semi-ready products and packing materials to production	:Carries out production's forklift runs on the basis of system information	:Unloads loads to the correct places in production. Transfers goods between departments	:Carries out production settings collections	:Inspects production settings	:Carries out partial assemblies for production	
E	Is familiar with duties and systems involved in storage control	:Takes inventory of and inspects stocks. Glancingly oversees quality, checking stock codes ID's. Records data in storage control system.	:Maintains basic information on products and storage spaces. Carries out necessary changes in storage information system	:Is familiar with storage control systems and equipment including computers, touchscreens, storage automation, RFID, operation control systems				
F	Takes principles of sustainable development into account in his/her work duties	:Works in accordance with environment objectives of company	:Uses machines and equipment energy-efficiently and economically, and uses them in a safe manner both indoors and out	:Takes care of sorting and recycling and/or re-utilization	:Keeps machines in running order. Prioritizes repair of faulty equipment. Disposes of faulty products properly.	:Avoids use of disposables and singly packed items. Avoids idle and excess use work machines	:Seeks alternative modes of operation in line with sustainable development	
G	Can maintain and enhance customer and stakeholder relations	:Cooperates with other departments and employees of the company	:Cooperates with customers, suppliers and transporters as well as with others	:Takes care of customer and partner satisfaction				
G	Demonstrates interpersonal skills	:Is able to work in interpersonal relations with different kinds of people in a manner conducive to duties. Works naturally in different kinds of interpersonal situations	:Handles work-related documentation according to established norms. Draws up documents in linguistically correct language. Verbally expresses self clearly and understandably in a manner conducive to duties	:Presents self convincingly and credibly. Familiar with basic use of most common computer programs. Acquires and forwards information using online tools. Works constructively in team and group-work situations	:Recognizes new potential partners and creates functional cooperative relations and networks. Manages problem situations in accordance with company norms and policies	:In decision-making situations, is capable of comparing alternatives and selecting most appropriate for situation. Works flexibly and creatively. Forecasts and prevents occurrence of problem situations	:Relates positively to learning and recognizes need to learn new things, create ideas, develop and experiment with alternative solutions, in both own and department work. Follows professional ethics, such as non-divulgence and obedience of consumer protection regulations	:Works responsibly, fairly and according to agreements. Behaves considerately and keeps own workstation and common areas in order. Sees opportunities to enhance whole organization's positive atmosphere
H	Demonstrates personal skills	:Works conscientiously and in a customer-oriented manner	:Takes care of worker welfare and health	:Work in accordance with laws and regulations	:Follows operational system directions and company rules	:Possesses project-work skills	:Possesses language skills	:Makes use of technology and information technology

Competence Development of Logistics Centers

4) Forwarders								
Competence areas								
	1	2	3	4	5	6	7	
A	Can handle import deliveries	Opens and maintains import gigs. Handles customs documents. Makes loading lists and waybills	Organizes transports, such as from harbor to own storehouses. Prices import assignments	Ottaa EU- ja vaapaaraston panonumerot ja otot Takes EU loading numbers of the bonded warehouse	Instructs representatives and shippers. Follows delivery situations	Inspects import deliveries. Gives unloading permits	Takes care of warehouse bookkeeping. Orders transports.	Makes terminal notifications and oversees general archiving
B	Can handle export deliveries	Prepares export assignments. Surveys routings	Opens and maintains export assignments. Prices export assignments	Modifies and makes loading lists and waybills. Orders transports and reserves load-space	Inspects export deliveries. Arranges special deliveries and goods deliveries from warehouse	Takes care of warehouse bookkeeping	Follows delivery situations. Handles terminal notifications and filing	Takes care of cross-trade deliveries, oversea and overland export deliveries
C	Can handle forwarding assignments	Combines documentation for the correct gigs	Inspects incoming forwarding assignments	Makes lists of incoming deliveries for customer and for terminal	Opens gigs. Arranges customs and transit	Requests shipping permits and makes shipping confirmation requests	Instructs agents on bills of lading and shipper bookings	Advises customers and partners
D	Is able to verify advantages of clients	Chooses representatives for clients	Selects freight drivers for clients	Makes and delivers instructions for representatives and freight drivers	Plans transports	Makes necessary contracts	Inspects, among other things, goods, packing condition, labels, numbers and documents	Informs client of irregularities and exceptional conditions
E	Can handle financial management duties	Handles duties pertaining to invoicing	Makes intrastat statistics	Files documents	Inspects/ap-proves reports			
F	Takes principles of sustainable development into account in his/her work duties	Can carry out company environmental objectives in own duties	Considers environmental effects of operations	Considers environmental factors in acquisition	Considers environmental factors in routing	Arranges optimal delivery and return loading	Arranges environment training and instruction for partners	Communicates environment reports to internal and external customers and stakeholders
G	Can maintain and enhance customer and stakeholder relations	Cooperates with internal customers and stakeholders	Cooperates with external customers and stakeholders	Secures customer and stakeholder satisfaction				
G	Demonstrates interpersonal skills	Is able to work in interpersonal relations with different kinds of people in a manner conducive to duties. Works naturally in different kinds of interpersonal situations	Handles work-related documentation according to established norms. Draws up documents in linguistically correct language. Verbally expresses self clearly and understandably in a manner conducive to duties	Presents self convincingly and credibly. Familiar with basic use of most common computer programs. Acquires and forwards information using online tools. Works constructively in team and group-work situations	Recognizes new potential partners and creates functional cooperative relations and networks. Manages problem situations in accordance with company norms and policies	In decision-making situations, is capable of comparing alternatives and selecting most appropriate for situation. Works flexibly and creatively. Forecasts and prevents occurrence of problem situations	Relates positively to learning and recognizes need to learn new things, create ideas, develop and experiment with alternative solutions, in both own and department work. Follows professional ethics, such as non-devulgence and obedience of consumer protection regulations	Works responsibly, fairly and according to agreements. Behaves considerately and keeps own workstation and common areas in order. Sees opportunities to enhance whole organization's positive atmosphere
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5) Purchasers								
Competence areas	1	2	3	4	5	6	7	
A	Can carry out, evaluate and develop strategic purchasing policy	Forms acquisitions strategy, defines its objectives and monitoring indicators	Formulates strategies and business operations plans in cooperation with suppliers	Plans and directs strategy-guided acquisition operations	Evaluates and develops acquisition strategy			
B	Can maintain and develop delivery chain cost-effectively	Conceptualizes delivery chain holistically	Creates, follows up on and takes advantage of demand projections	Evaluates and develops delivery chain and purchasing operations	Utilizes operations direction system and participates in developing systems			
C	Is familiar with supplier markets and seeks out new suppliers	Acquainted with supplier markets and looks for new suppliers	Puts suppliers into competitive bidding and evaluates suppliers	Approves new suppliers	Negotiates purchasing agreements	Compares supplier prices and follows price development	Annually negotiates and re-evaluates supplier contracts	
D	Can carry out operative purchasing duties	Creates and sends requests for offers of tender. Compares offers.	Carries out acquisition orders and/or call-backs based upon acquisition recommendations, salesperson orders, alarm-level impulses or forecasts	Makes reclamations and takes care to follow up their enforcement	Verifies, approves and files purchase invoices	Follows the realization of stated objectives and reports on purchases	Takes care of documentation and statistics (external and internal transactions etc etc)	
E	Has command of materials, products and services and is able to take care of product and storage control	Is familiar with products and services s/he has purchased, their characteristics and principle of their production	Takes environmental and safety regulations into consideration	Gives products titles and maintains product register. Keeps product inventory levels above alarm level	Follows stock levels by both product title and as an entirety	Follows product and stock control indicators (product circulation and such)	Takes care of and reports on timing and availability of products	
F	takes principles of sustainable development into account in his/her work duties	Obeys ethical and environmental principles of the firm in purchasing and in the whole delivery chain	Applies ethical and environmental purchase criteria also to suppliers	Considers ethical and environmental factors in supplier selection	Considers environmental factors over product's whole life cycle	Makes local area acquisitions. Makes pooled purchases	Audits delivery chains also from the ethical and environmental point of view	
G	Can maintain and enhance customer and stakeholder relations	Takes care to regularly meet with suppliers and with company's own acquisition organization	Develops products/services in cooperation with suppliers in a customer-oriented manner	Takes care of service level of suppliers and monitoring of operations and of delivery supervision	Is familiar with supplier relation risks. Develops supplier cooperation	Cooperates with external partners	Cooperates with internal partners. Secures customer and partner satisfaction	
H	Can plan, direct, evaluate and develop subordinates' work and competence	Plans necessary personnel resourcing	Participates in recruiting. Familiarizes him/herself with and takes care of guidance of new staff	Works in accordance with labor law and contract demands	Takes care of work safety and worker welfare. Carries out foreman/subordinate development discussions	Directs and assesses personnel actions and performance. Assesses job complexity (TVA)	Forecasts, maintains and develops personnel competence. Maintains and updates tools of leadership competences.	
I	Can foresee, plan and evaluate operations and take care of technical resources	Forecasts and follows market development. Plans and directs operations	Draws up budget. Draws up action plans. Follows up on realization of budget and action plans.	Plans for and secures operational resources	Reports on operational results and economy	Evaluates and develops operations	Secures efficiency and quality of operations	
G	Demonstrates interpersonal skills	Is able to work in interpersonal relations with different kinds of people in a manner conducive to duties. Works naturally in different kinds of interpersonal situations	Handles work-related documentation according to established norms. Draws up documents in linguistically correct language. Verbally expresses self clearly and understandably in a manner conducive to duties	Presents self convincingly and credibly. Familiar with basic use of most common computer programs. Acquires and forwards information using online tools. Works constructively in team and group-work situations	Recognizes new potential partners and creates functional cooperative relations and networks. Manages problem situations in accordance with company norms and policies	In decision-making situations, is capable of comparing alternatives and selecting most appropriate for situation. Works flexibly and creatively. Forecasts and prevents occurrence of problem situations	Relates positively to learning and recognizes need to learn new things, create ideas, development and experiment with alternative solutions, in both own and department work. Follows professional ethics, such as non-devulgence and obedience of consumer protection regulations	Works responsibly, fairly and according to agreements. Behaves considerately and keeps own workstation and common areas in order. Sees opportunities to enhance whole organization's positive atmosphere
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Competence Development of Logistics Centers

6) Customer Service and Sales									
Competence areas									
	1	2	3	4	5	6	7		
A	Can forecast and control supply and demand and make pricing strategies and operation planning	Follows changes, reports and statistics in operational environments	Makes competitor analyses and informs, for example, the product management and delivery chains within the firm's organization	Forecasts and updates demand and considers this in formulating logistics solutions	Plans and segments target groups, areas, cities and branches	Participates in formulating pricing strategies, marketing, sales budgeting and in operations planning.	Follows realization and sales of offers and reports on the situation to the firm's delivery and production network	Trains store personnel on new products, pricing models and service concepts	
B	Knows order-handling process and can tailor products to customer needs	Can take responsibility for domestic and foreign ordering process and reserve capacity for incoming customer orders	Places orders into operations direction systems and supervises payment of orders	Considers effects of special customer wishes on the break-through time and logistics of products	Coordinates customers' delivery needs and communicates the special needs and reasons to the production and delivery chain	Informs customers of delivery schedules and possible late deliveries and exceptional arrangements	Directs production and packing in special packing demands, labellings and documentation.	Sorts out demands for special products and seasonal products and keeps purchasing and production updated	
C	Can price products and services and form sales, delivery and project agreements	Seeks and develops possibilities to offer broader delivery and service packages	Makes project profitability calculations in co-operation with technical management	Pricing product considering total cost including logistics risks and costs, and including added value.	Formulates sales and delivery agreements which benefit both parties, and considering logistics factors	Compares, prices and arranges transports	Surveys routes and arranges for optimal routing and means of transport	Updates product data base and maintains customer register	
D	Is familiar with sales, service and clientele management and after-sales operations	Can make, produce and examine market studies	Plans, evaluates and develops marketing and sales	Sells and markets products, deliveries and services holistically	Provides firm with increased sales and works in ways suitable to service provider industry	Confirms and prioritizes orders	Cares after customer reclamations between customer, sales, production and fringe groups, taking customer's point of view into consideration	Sorts out reasons for reclamations and sees to actions to settle issue	
E	Takes principles of sustainable development into account in his/her work duties	Works according to firm's objectives of sustainable development and follows firm's ethical principles	Recommends alternative solutions considering total product life-cycle and environment factors	Chooses and offers environmentally-friendly transport modes	Relays environmental reports to customers and to internal and external fringe groups	Organizes environmental education and training to partners			
F	Can maintain and enhance customer and stakeholder relations	Cooperates with internal customers and partner groups	Cooperates with external customers and partner groups	Cooperates with customs officials, insurance companies and forwarders (INCOTERMS, Proof of Delivery etc etc)	Cares for internal and external communication regarding, among other things, changes in product, operations and demands.	Secures customer and partner satisfaction and ensures feedback flow through entire cooperative and partner network			
G	Can plan, direct, evaluate and develop subordinates' work and competence	Plans necessary personnel resourcing	Participates in recruiting, following up and seeing to training new personnel	Works in accordance with labor regulations and contract demands	Takes care of work safety and labor welfare matters	Directs and evaluates personnel actions and work. Evaluates job stress. Carries out foreman/underling job development discussions	Anticipates, maintains and develops staff competences. Takes care of staff welfare.	Maintains and updates tools and means of competency leadership	
H	Can foresee, plan and evaluate operations and take care of technical resources	Anticipates and follows market developments. Plans and directs operations	Formulates budget and action plans. Follows realization of budget and action plans	Plans and secures operational resources	Reports on results of actions and on economy	Evaluates and develops operations	Develops service products	Secures efficiency and quality of operations	
G	Demonstrates interpersonal skills	Is able to work in interpersonal relations with different kinds of people in a manner conducive to duties. Works naturally in different kinds of interpersonal situations	Handles work-related documentation according to established norms. Draws up documents in linguistically correct language. Verbally expresses self clearly and understandably in a manner conducive to duties	Presents self convincingly and credibly. Familiar with basic use of most common computer programs. Acquires and forwards information using online tools. Works constructively in team and group-work situations	Recognizes new potential partners and creates functional cooperative relations and networks. Manages problem situations in accordance with company norms and policies	In decision-making situations, is capable of comparing alternatives and selecting most appropriate for situation. Works flexibly and creatively. Forecasts and prevents occurrence of problem situations	Relates positively to learning and recognizes need to learn new things, create ideas, develop and experiment with alternative solutions, in both own and department work. Follows professional ethics, such as non-devulgence and obedience of consumer protection regulations	Works responsibly, fairly and according to agreements. Behaves considerately and keeps own workstation and common areas in order. Sees opportunities to enhance whole organization's positive atmosphere	
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7) Distribution								
Competence areas								
		2	3	4	5	6	7	
A	Can plan and maintain optimal routes	Routes new customers	Plans new routes' dispatches	Maintains routes and looks after route changes	Plans and executes route variations caused by public holidays	Organizes extra runs	Clarifies distribution issues	
B	Can take care of warehouse operations and technical resources	Maintains warehouses and organizes assemblies and maintenances	Follows and updates inventories	Makes inventories	Takes care of premises maintenance	Takes care of equipment maintenance	Reserves adequate equipment and supplies	
C	Can look after product and service procurement and contract cooperation	Compiles and negotiates procurement contracts	Makes product and service purchases	Analyzes and handles transport offers	Makes transport contracts	Manages and controls contracts related to distribution operations	Controls and guides contract partner operations	Evaluates the quality of contract partners' actions
D	Takes principles of sustainable development into account in his/her work duties	Concretes company's environmental objects in own work tasks	Takes operations' environmental effects into consideration	Considers environmental factors in procurement	Considers environmental factors in routing	Plans optimal loads for out-going and in-coming deliveries	Organizes environmental training for workers	communicates environmental reports to customers and internal and external stakeholders
E	Can maintain and enhance customer and stakeholder relations	Functions in co-operation with internal customers and stakeholders	Finds and recruits new cooperation partners	Plans, guides, trains and controls cooperation partners' operations	Functions in co-operation with external customers and stakeholders	Handles customer feedback	Ensures customer satisfaction	
F	Can plan, direct, evaluate and develop subordinates' work and competence	Plans necessary personnel resources	Participates recruiting. Looks after orientation and guidance of new employees	Functions according to work legislation, collective agreements and contracts of employment	Takes care of work safety and well-being matters. Attends superior-employee development conversations	Guides and evaluates personnel operations and performances	Anticipates, maintains and develops personnel competence. Maintains and updates competence management tools	
G	Can plan, guide, evaluate and develop operations and economy in own area of responsibility	Foresees and follows market development, plans and guides operations	Makes budgets and operations plans and follows their execution and fulfillment	Plans and secures operational resources	Reports operations results and economy	Evaluates and develops operations	Develops service products	Secures operations effectiveness and quality
G	Demonstrates interpersonal skills	Is able to work in interpersonal relations with different kinds of people in a manner conducive to duties. Works naturally in different kinds of interpersonal situations	Handles work-related documentation according to established norms. Draws up documents in linguistically correct language. Verbally expresses self clearly and understandably in a manner conducive to duties	Presents self convincingly and credibly. Familiar with basic use of most common computer programs. Acquires and forwards information using online tools. Works constructively in team and group-work situations	Recognizes new potential partners and creates functional cooperative relations and networks. Manages problem situations in accordance with company norms and policies	In decision-making situations, is capable of comparing alternatives and selecting most appropriate for situation. Works flexibly and creatively. Forecasts and prevents occurrence of problem situations	Relates positively to learning and recognizes new things, create ideas, develop and experiment with alternative solutions, in both own and department work. Follows professional ethics, such as non-devulgence and obedience of consumer protection regulations	Works responsibly, fairly and according to agreements. Behaves considerately and keeps own workstation and common areas in order. Sees opportunities to enhance whole organization's positive atmosphere
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Competence Development of Logistics Centers

8) Transportation								
Competence areas								
	1	2	3	4	5	6		
A	Is safe driver and can foresee risks.	Anticipates risk situations and avoids dangers.	Able to control vehicle in difficult driving conditions	Controls deliveries in urban environments	Controls special challenges in making deliveries in urban environments	Is familiar with delivery vehicle's safety systems and equipment		
B	Knows the principles of safe transport	Understands the risks born of careless loading	Understands the effects of forces on loads during transport	Is able to assess risks of loads falling or moving	Knows principles of load securement	Understands load distribution principles		
C	Understands transporter liability.	Carries out inspection of vehicle and equipment before disembarking	Delivers and and picks up as required by transporter	Is able to apply legal requirements and adapt knowledge of transport goods' characteristics	Takes measures to secure safe operation of vehicle and its equipment (is technically able)	Drives safely and economically according to instructions and law		
D	Knows how to react in abnormal situations	Is able to clearly define observed damage in damage situations	Is able to change most common spare parts using hand tools if necessary	Sets up for repairs for maintenance personnel	In accident situations, is able to take precautions against causing chain-reaction accidents	Is trained in first aid		
E	Is familiar with work duties in connection with terminal operations	Prepares vehicle for loading and unloading readiness	Unloads deliveries in specified areas or into sales storage spaces	Loads vehicle to maximum load allowable by conditions and regulations, according to	Receives and delivers forward consignment notes	Is familiar with fulfillment of official customs requirements	Uses aids in loading and unloading (hydraulic dollies and rollers)	
F	Understands transport regulations	Works in accordance with regulations	Is aware of legal supervision and sanctions	Employs digital tracking and makes interpretations on information therein.	Reports daily on work carried out			
G	Takes principles of sustainable development into account in his/her work duties	Works according to environmental objectives of enterprise	Drives to achieve fuel and emission efficiency. Avoids idling.	Considers environmental effects of traffic, service and repair situations.	Takes care of sorting, recycling and reutilization. Properly disposes of faulty equipment	Avoids using disposable goods and singly packed products	Uses online tools in communication. Seeks sustainable alternatives in work methods.	
H	Can maintain and enhance customer and stakeholder relations	Can collaborate with internal customers and fringe groups	Can collaborate with external customers and fringe groups	Secures customer and fringe group satisfaction	Adeptly represents firm to customers			
G	Demonstrates interpersonal skills	Is able to work in interpersonal relations with different kinds of people in a manner conducive to duties. Works naturally in different kinds of interpersonal situations	Handles work-related documentation according to established norms. Draws up documents in linguistically correct language. Verbally expresses self clearly and understandably in a manner conducive to duties	Presents self convincingly and credibly. Familiar with basic use of most common computer programs. Acquires and forwards information using online tools. Works constructively in team and group-work situations	Recognizes new potential partners and creates functional cooperative relations and networks. Manages problem situations in accordance with company norms and policies	In decision-making situations, is capable of comparing alternatives and selecting most appropriate for situation. Works flexibly and creatively. Forecasts and prevents occurrence of problem situations	Relates positively to learning and recognizes need to learn new things, create ideas, develop and experiment with alternative solutions, in both own and department work. Follows professional ethics, such as non-devulgence and obedience of consumer protection regulations	Works responsibly, fairly and according to agreements. Behaves considerately and keeps own workstation and common areas in order. Sees opportunities to enhance whole organization's positive atmosphere
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The ESLogC project advances Southern Finnish Logistics Centre Systems by developing operations and by producing new information on logistics centers. The project is funded by the European Regional Development Fund, and the participating communities and companies. Lahti University of Applied Sciences (LUAS), HAMK University of Applied Sciences and Laurea University of Applied Sciences form a Logistics Centers Competence Development sub-project which aims at improving the competitiveness of Southern Finnish logistics centers by developing the competence and the competence management of logistics operators.

This publication is a description of the project activities and a summary of the main results. Part I, Competence Management and Development in Finnish Logistics Centers describes the process and the methods of competence management and development carried out in the ESLogC project as well as the results of competence identification, competence assessment and competence acquisition carried out in the project. Part II, Finnish Logistics Education is a study of the present state of logistics education in Finland and its development needs based on the results of the competence assessment survey.



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ISSN 1457-8328

ISBN: 978-951-827-160-7