



# Analysis of Characteristics of Cultivation System of the Major of Logistics in Japan

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**Abstract.** Using Ryutsu Keizai University in Japan as an example, this paper analyzes the characteristics of cultivation system of the major of logistics in Japan. Aspects including cultivation purpose and goals, principles of granting degrees, principles of curriculum, and courses on the list are explained and analyzed. These above introduced contents provide experience we can learn from. The experience includes necessity of comparing the cultivation system of logistics personnel with advanced countries and regions, specifying the different careers of the students due to their various levels of degrees in logistics industry, implementing practice courses together with companies, paying attention to the improvement of the humanistic and comprehensive ability of students, timely introducing the corresponding courses to the new technologies applied in the industry.

**Keywords:** major of logistics in Japan · cultivation system · Ryutsu Keizai University

## 1 Introduction

In order to establish a “robust logistics system” that can meet new challenges, the Japanese government has adopted “the outline of comprehensive logistics measures (2017–2020)” [1] (approved by the Japanese government on July 28, 2017, hereinafter referred to as the “Outline”) and proposed measures to improve logistics productivity from six aspects. Among these six aspects, the Outline clearly proposes that (1) ensuring and cultivating logistics talents and (2) improving public awareness of logistics will be the fundamentals of all tasks. In terms of ensuring and cultivating logistics talents, it mainly focuses on three directions: 1) ensuring various human resources in the logistics field and cultivating human resources that can manage increasingly complex logistics systems; 2) developing local human resources to contribute to the overseas development of Japanese companies; 3) cultivating professionals for the complex logistics system design and management.

In terms of training logistics talents, Watanabe et al. [2] divided the majors related to logistics and supply chain from 75 universities in Japan into three groups according to the majors’ characteristics. In Group 1, their cultivation system concentrates intensively courses related logistics and supply chain. Group 2 see its members cultivating students’

abilities focusing on circulation, market, commerce and enterprise management, as well as including some courses related to logistics and supply chain in a complementary way. In group 3, the majors in these universities possess a limited number of courses related to logistics and supply chain, which strengthen students' corresponding ability in some specific fields, such as the industries of food, fishery, machinery.

Even in Group 1, universities have various characteristics and methods for cultivation. For example, as an engineering department, the Faculty of Marine Technology in Tokyo University of Marine Science and Technology its curriculum reflects the characteristics of integrating of human culture and science, which includes courses related to mathematics, computer, economy, business management, etc. While the cultivation of Ryutsu Keizai University in Japan highlights three characteristics in the teaching process, which are the cultivation of fundamental and comprehensive ability, the cultivation of practical ability, and teaching via small-size class. It sets up corresponding courses according to the students' targeted career directions. Meanwhile, Ryutsu Keizai University also has master's and doctoral courses for obtaining corresponding degrees in logistics and information. In Japan, it is a very representative university covering the undergraduate, master's and doctoral courses in logistics management major, and granting degrees at these three levels.

Therefore, this paper takes Ryutsu Keizai University as an example to analyze the cultivation system of students majoring in logistics management in Japan. We focus on the education purpose and goals, the principle of granting degrees, the principle of curriculum and courses. Based on these, some comments and recommendations are summarized, which could be helpful to improve the whole system of cultivating talents in logistics.

## 2 School Profile

Ryutsu Keizai University, a private university in Japan, was founded in 1965 with the investment of Nippon Express [3]. The original intention of establishing this university is to solve the problems of production and consumption activities generated inside the immature and incomplete circulation and logistics system in the context of rapid economic development in Japan in the 1960s by attempting to improve the knowledge and skills of staffs in the field of transportation and circulation. So far, the university consists of five faculties and it is a medium-sized comprehensive university in Japan. The education of Ryutsu Keizai University pays attention to the cultivation of practical ability, aiming to cultivate industrialists with high literacy. The University adheres to the characteristics of small-size class, and achieves a high employment rate in Japanese society.

Ryutsu Keizai University has undergraduate course, master courses and doctor course in the field of logistics management, awarding bachelor degree, master degree and doctor degree respectively. The following sections explain the education policies at the undergraduate stage and graduate stage respectively.

### 3 Educational Policy at the Stage of Undergraduate

The overall educational policy of the Faculty of Distribution and Logistics Systems is to cultivate talents who can contribute to the progress of the distribution industry in the context of the information society through the organic combination of information science and distribution science. With the wide application of Internet of things (IOT), artificial intelligence (AI), robotics, big data analysis and other technologies in practice, to integrate information science and distribution science has become one of the vital work of Faculty of Distribution and Logistics Systems. Distribution and information science overlap with the logistics and data science fields today. In the super intelligent society of social 5.0, what is needed is not only talents with knowledge and skills in these fields, but also those who can use these knowledge and skills to collect and analyze data and to optimize the distribution system, which is also the goal of the Faculty of Distribution and Logistics Systems in talent cultivation.

#### 3.1 Education Objectives

The education goal of the Major of Distribution and Logistics Systems is to cultivate talents to be able to integrate the concept of logistics into the design of economic and social systems [4].

#### 3.2 Diploma Policy

Under the above objectives, students can be awarded a bachelor degree in the Major of Distribution and Logistics Systems after both completing the required credits and obtaining the following four types of knowledge and abilities [4]:

- 1). A wide range of knowledge and skills in circulation, logistics, information and other disciplines.
- 2). A sense of responsibility to perform corresponding works and duties, after being trained by various practical and theoretical courses.
- 3). Able to find and solve problems related to circulation and informatics with the learned knowledge and skills.
- 4). Demonstration of creativity in corresponding professional fields resulting in contribution to the whole society. Communication ability in foreign languages, as required in the situation of extensively participating in various activities globally.

### 3.3 Policy of Formulating and Implementing Curriculum System

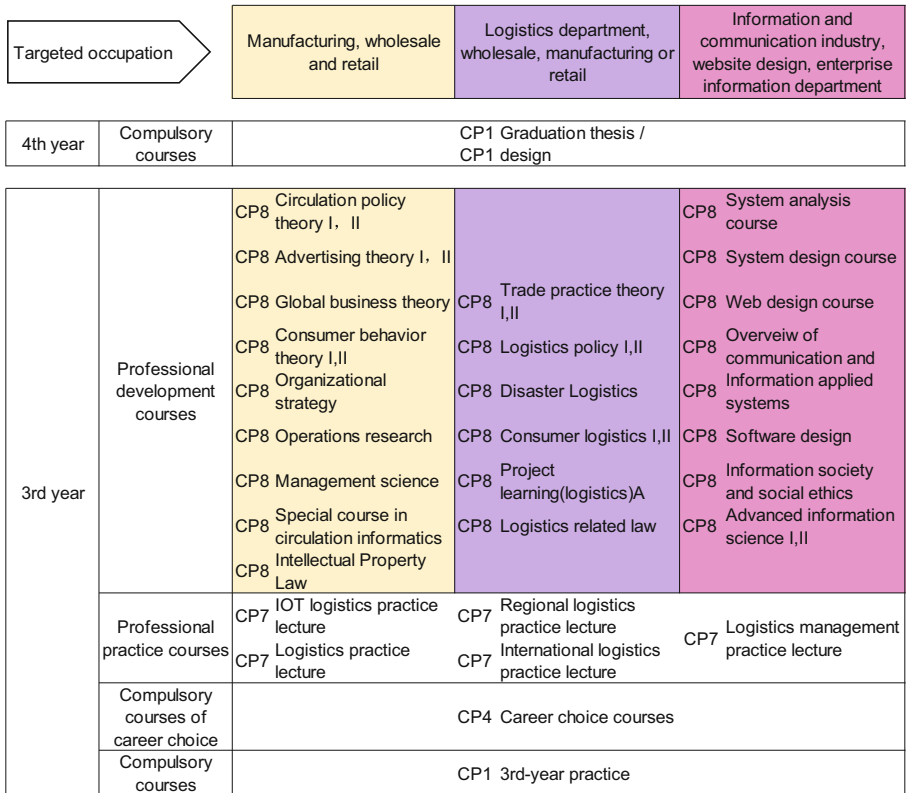
Under the above objectives, the Major of Distribution and Logistics Systems formulates and implements a four-year curriculum system framework to help students obtain knowledge and ability in stages. This curriculum system framework has its characteristics as follows [4].

- 1). Practical courses and graduation design (or thesis) cultivates students' ability to find and solve problems. Fundamental courses cultivate students' ability of analyzing data.
- 2). Foreign language courses improve students' ability of communication in foreign languages in order to make them function as important roles.
- 3). Courses related to humanities, social sciences and natural science broaden students' view to strengthen their comprehensive ability.
- 4). Courses related to career development cultivate students to get lifelong learning ability and positive attitude towards self-realization.
- 5). Major compulsory courses ensure students understand the basic concepts related to logistics and informatics in the field of Distribution and Logistics Systems.
- 6). Major fundamental courses ensure students master the basic knowledge and skills related to distribution, logistics, informatics in the field of Distribution and Logistics Systems.
- 7). Major practical courses help students correctly understand the current situation in the industrial field through experiencing the life in the enterprises in the same field.
- 8). Major extension courses improve students' ability of discovering and solving problems related to distribution, logistics and informatics.

### 3.4 Advanced Courses in the Curriculum System

In order to ensure that students can obtain the four types of types of knowledge and abilities related to diploma policy (DP) mentioned in Sect. 3.2, a curriculum system map of the Major of Distribution and Logistics Systems has been formulated as shown in Fig. 1, which consists of six Curriculum Series (from CP1 to CP6) [5]:

- CP1 includes a series of liberal arts courses related to humanities, geography, social research, nature and health, foreign language and career development, which help students have a broad vision and rich humanistic feelings.
- CP2 is a series of courses providing knowledge related to business and operation management in the field of Distribution and Logistics Systems.
- CP3 is a series of courses providing technical knowledge related to logistics in the field of Distribution and Logistics Systems.
- CP4 is a series of courses providing information processing and utilization technology in the field of Distribution and Logistics Systems.
- Cp5 is a series of courses providing knowledge and technology needed in the field-work.
- CP6 is a series of courses enhancing students' communication skills, as well as the ability to discover and solve problems.



**Fig. 1.** Map of undergraduate curriculum system (3rd year to 4th year) of the Major of Distribution and Logistics Systems, Ryutsu Keizai University in Japan [6]

This curriculum system map cover three directions of students’ future careers according to their future career goals as well as guidance provided from the university side. These three directions include comprehensive distribution, logistics and informatics. The first direction makes a goal to cultivate students with a wide range of knowledge in the field of distribution and informatics. And the second direction tries to make students become the experts in the field of logistics. While, the third direction help the students to have a compound knowledge of logistics and IT technology. During the first and second year, students in the above three directions study the same fundamental courses while from the third year, students choose one direction and learn the corresponding courses in one of the directions. The curriculum system map points out the best combination and sequence of courses for the students in this major (Fig. 2).

2nd year	Professional basic courses	CP6 Marketing theory I,II CP6 International Marketing theory I,II CP6 Business strategy theory I,II CP6 Bookkeeping theory I,II	CP6 Circulation information system theory I,II CP6 Logistics business theory I,II CP6 Logistics system theory I,II CP6 International logistic I,II CP6 Overview of transportation I,II	CP6 Application programming I,II CP6 Database CP6 Data science and Practice CP6 Human interface theory CP6 Algorithm theory CP6 Multimedia information
	Professional practice courses	CP7 Information system practice lecture CP7 Lecture of Nippon Express I,II	CP7 Direct marketing practice lecture CP7 National transportation alliance lecture	CP7 Visiting logistics enterprises lecture CP7 Nomura Securities enterprise lecture
	Compulsory courses of career choice	CP4 Career Planning II	CP4 Internship	CP4 Career counseling
	Compulsory courses	CP1 2-year practice		
1st year	Professional basic courses		CP6 Overview of CP6 Overview of CP6 Programming Basics CP6 Introduction of	
	Compulsory courses		CP5 Overview of CP5 Overview of Logistics CP4 Career Planning I CP1 Information / data CP1 basic literacy practice CP1 1-year practice	
Major		Comprehensive Circulation	Logistics	Informatics

**Fig. 2.** Map of undergraduate curriculum system (1st year to 2nd year) of the Major of Distribution and Logistics Systems, Ryutsu Keizai University in Japan [6]

### 4 Educational Policy for the Graduate Students

In addition, Ryutsu Keizai University also provide master course and doctor course in the Faculty of Distribution and Logistics Systems. The career goals of master course students include [7]: 1) experts of doing logistics system plan, development, operation and management in the logistics department of companies, 2) experts of improving the efficiency and optimizing the international logistics system in international logistics companies, 3) research staff of making logistics policy and doing information management, operation and investigation related to logistics for government and consulting companies, and 4) teaching staffs and researchers various education institutions, whose job contents related to logistics. The career goal of doctor course students is researchers and teachers for building new academic system of Distribution and Logistics Systems, which can cultivate technicians with high-level knowledge for investigate, plan and develop logistics system in the context of information and network technology. These cultivated technicians can function as leaders of high-tech logistics in companies related to manufacture, logistics and distribution.

#### 4.1 Diploma Policy

The Faculty of Distribution and Logistics Systems focuses not only on practice during the students' cultivation. The students in the future can be high-level technical staffs who can effectively manage the whole process (from production to distribution) of goods and information, considering environmental and risk issues. Students can obtain their master degree and doctor degree after they complete the required credits and pass the exams required by the graduate school [8].

Master course cultivates students to have the ability of solving problems with technical knowledge related to Distribution and Logistics Systems with a wide perspective. Another ability in the cultivation is the one to logically analyze social phenomena with a technical framework.

Doctor course cultivates students to have the ability of deeply analyzing problems with technical knowledge related to Distribution and Logistics Systems with a wide perspective. Another ability in the cultivation is being able to propose and implement high-level creative research projects after summarizing existing research results in this field.

#### 4.2 Curriculum Policy

Faculty of Distribution and Logistics Systems develops the curriculum of graduate students with a goal as cultivating graduate students with the ability of solving problems related to optimizing and improving traditional logistics system to deliver the suitable stuff to customers at appropriate time in a complex background mixed by globalization, competition and environmental concerns with fast growing information and internet technologies. Courses in the curriculum are chosen and set according to this goal [8]. In addition, curriculum has been improved in 2008 by inviting industrial experts to give speeches to students, organizing students to have investigation the field production activities inside the companies and factories, implementing research with practical problems happened in the companies and factories, and giving courses with resources from both university and company sides.

Master course contains two directions, logistic direction and informatics direction. The former focuses on courses related to enterprise logistics while the latter cultivates students with advanced courses related to information technology application system.

As far as doctor course is concerned, there is no distinction between compulsory and elective courses. However, doctoral students have to select courses according to their supervisors' advice and their dissertation topics. They have to complete 8-credit courses related to Distribution and Logistics Systems and earn another 12 credits in the form of research and guidance.

### 5 Discussion and Conclusions

Taking the Faculty of Distribution and Logistics Systems from Ryutsu Keizai University in Japan an example, this paper analyze the cultivation systems of the major of Distribution and Logistics Systems and summarize its several characteristics, which could

be referred by other countries for strengthening their own logistics related majors for cultivating students in the background of improving traditional logistics industry to a modern one.

### **5.1 Compare the Cultivation System of Logistics Personnel with Advanced Countries and Regions to Discover the Gap and to Analyze the Ways to Improve It**

In 2021, the Ministry of land, resources and transportation of Japan released the “logistics field, high talent cultivation, ensuring high talent cultivation and Research (intermediate report)” [2], which provides not only a summary of 75 universities in Japan cultivate students with the major of logistics or supply chain management, but also analyzes the characteristics of cultivation system of students of the same majors in United States and China. This report also concludes Japan should cultivate advanced personnel of logistics or supply chain management under a comprehensive framework composed of industry, university and government.

This action organized by the government is worthy experience which should be learned by other countries which would also like to improve their cultivation system of logistics personnel.

### **5.2 Specify Various Careers of Students with Different-Level Degrees**

Ryutsu Keizai University specify various directions of careers of both bachelor and master course students according to the characteristics of students and demand from industry. For bachelor course students, there are three directions under the Major of Distribution and Logistics Systems. Students in the three directions have to study the same fundamental courses before choosing a specific direction and studying the courses in this direction. The specific directions help the students satisfy various personnel demands from the industry according to the development map of ability in each direction. For master course students, two directions are set and they can select either of them. Students selecting one direction have also to select several courses in the other direction. This requirement is caused by internal relationship between the two directions.

The directions under the Major of Distribution and Logistics Systems and relationship among courses in various directions are referable to other countries. Courses in various directions under the major of logistics or supply chain management should be related to each other, especially to the directions which have internal relationship. Courses whose content is job searching or career development are also vital to the students and should be arranged across four years, resulting to help students to find their suitable career direction gradually.

### **5.3 Implement Practice Courses Together with Enterprises**

In Japan, the major of logistics is regarded as a discipline closely related to practice and real production. Both in the undergraduate and graduate training stage, great importance is attached both to include practical courses in the curriculum system, and to specify the important role enterprises in the practical courses.



The major of logistics is the one closely related to practice and enterprises in the industry, no matter in Japan or other countries. During the four years of cultivation, technical tour to the field work in the enterprises, speeches given by the experts from the enterprises, graduation thesis with contents solving the technical problems happened in the enterprises, and courses given in a combined way by the university and enterprises are essential ways of strengthening the practical ability of students.

#### **5.4 Pay Attention to the Improvement of the Humanistic and Comprehensive Ability of Students**

Besides the courses related to the logistics field, the Major of Distribution and Logistics Systems in Ryutsu Keizai University also include courses of humanities, social sciences and natural sciences in the curriculum, intending to broaden the vision and to strengthen comprehensive ability of the students.

The courses of humanities, social sciences and natural sciences should be part of the curriculum of students, especially whose major is engineering, science. Students with the major of logistics are definitely this type of students.

#### **5.5 Timely Introduce the Courses Reflecting the New Technologies Applied in the Industry**

Emerging technologies such as Internet of things (IOT), artificial intelligence (AI), robotics and big data analysis have triggered a series of changes in production efficiency and producing ways in almost all types of industries. The changes by these new technologies also happen in the logistics industry. As a result, courses related to these emerging technologies should be timely included in the curriculum of students majoring logistics or supply chain management. It is particularly urgent for students to understand and master the application of emerging technologies in their major via practical courses and interdisciplinary courses. Students with compound abilities from both traditional logistics industry and emerging technologies will play an important role in their future jobs and contribute to the development of smart logistics and smart society.

**Acknowledgments.** This paper was supported in a combined way by the following projects. 1) Research on Fostering System of Practitioners Majoring in Logistics Management Guided by New Liberal Arts Construction (Education Science Planning Project under Grant No. 2021GXJK335 funded by Education Science Planning Leader Office of Guangdong Province). 2) Exploration on the Management and Operation Mechanism of Internship and Training Base in the university of applied sciences (SZTU Education Reform Project). 3). The ideological and political course (undergraduate level) demonstration team of the major of transportation engineering in universities in Guangdong Province. 4). 2022 Guangdong Province-Level Project of Teaching Quality Engineering and Teaching Reform for Constructing Fengxue Modern Industrial College of Logistics and Supply Chain.

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