Japan Society for the Promotion of Science Grants-in-Aid for Scientific Research (B)

Term of Project: FY2013 to FY2016

Comparative Longitudinal Study on Changes in Structures for Undergraduate Students to Form of Vocational Competency - Roles of Specialized Learning and Work Experience

I. Purpose of the Research

(Overview)

Based on the comparative longitudinal studies on changes in selection of an occupation and shaping of the occupational view of high school students as well as the educational and cultural factors thereof that were conducted in six countries during the period of FY2009 to FY2011, this project focuses on the processes in which the students of general universities and technical/vocational colleges including traceable high school graduates select their occupation and shape their view of occupation. In addition, it also concentrates on the processes by which they acquire their vocational skills, and further identifies changes in the related internal structure of those total vocational competency formation processes in a demonstrative approach in relation to the roles of their daily living activities including technical learning and part-time jobs. The project also aims to identify the roles of activities to form vocational competencies and the comparative characteristics of related structures in various countries, and further to shed the light to technical and vocational education in the higher education stage in Japan and how the relevance of the education with life at work should be.

1. Academic and Political Background of the Research

The issue related to the formation of vocational competencies (that are referred to as technical vocational skills, "fundamental competencies", or competence that shall be composed of various competencies and occupational view/work ethics) of students at the higher education stage seems to have moved from the discussion stage into practice mode since implementation of the "Career Guidance for Social and Vocational Independence" was required by the revision of the Standards for Establishment of Universities in 2010.

Pioneering figures in **total longitudinal research** on the processes of forming the said vocational competencies are shown in Super, D.E. *The Psychology of Careers*, 1957 that proposed the developmental stage of vocational skills in a person's entire life from the perspective of establishing his/her occupational self-concept and Schein, E. *Career Dynamics*, 1978 that identified the formation and change of career development likely in the entire life from the perception of forming "career anchors" (i.e., models of vocational skills, motivations, and values). These large demonstrative studies were extended in Japan by Miyauchi's longitudinal research on the overall development of career consciousness, interest, value, and competency through the youth period (*A Study on the Processes of Youth's Career Development*, 1986). However, perhaps because the studies were largely conducted by psychological researchers, they placed noticeable focus only on the

individual aspects of job consciousness. Examples are a longitudinal study on the relevance between self-efficacy and occupational selection/interest (Lent R.W., et al., *Journal of Vocational Behavior*, 2008 328-335) and "Career Awareness and Identity Style of High School and Undergraduate Students" (Maeda and Niimi, Bulletin 2010 of the Graduate School of Education, Hiroshima University).

In contrast, particularly since the 1990s, the fields of educational sociology, theory of higher education, and labor economics have advocated the so-called "Transitional Approach" (Yoshimoto, *International Comparisons of the School-to-Work Transition*, 1998), the "Relevance Approach" between education and occupation (Yuki Honda, *The Vocational Relevance of Education*, 2009), and the "Competence-based Approach" that means competence required in corporate society (Ogata, *Competence-based Approach Reconsidered*, 2010), and these have led to many studies attempting to demonstrate the relevance between high school/university education and the occupational category of students after employment or ability required for life at work from quantitative relevant structure. However, the issue related to the formation of vocational competencies seems to have highlighted the aspect of the relevant mechanism between school and occupation on the one hand, and the aspect of formal-discipline generic skills such as "Fundamental competencies for working persons", "Fundamental employability", "Competency-based bachelor's degrees", and "Basic and versatile competencies" on the other. Consequently, adequate focus has not been placed on technical and vocational education that is the major subject of higher education as well as studies meeting the activities of learning and living of the students themselves.

In recent years, rather than fragmentary studies with the individual aspects of vocational competencies cut out as aforementioned, noteworthy suggestions and analyses have been observed stating that the formation of competencies should be determined in the learning of students and their entire student life (Kaneko, *Undergraduate Education and Growth of Students*, Nagoya Journal of Higher Education, vol. 12, 2012). Furthermore, also in Germany, studies on higher education have been conducted based on a similar perspective (Briedis, K. usw. *Mit dem Bachelor in den Beruf.* 2011).

2. Circumstances leading to the idea

The applicant tracked the vocational competencies of undergraduate students not on a piecemeal basis, but totally and continuously from their high-school stage through the university-graduation (employment) stage and tried to investigate the structure used to develop and change the competencies in terms of comparative education culture and the theory of student life because of his past knowledge. One finding was that, although the applicant had a chance to become directly involved in nationwide discussions on the introduction of career education or guidance in schools, he came to realize that such discussions had generally converged with the issue of fundamental competencies as aforementioned and no sufficient consideration has been given to the development of vocational skills and ability to apply the skills through crucial technical education and further to shaping of the vocational view.

In addition, the applicant obtained a certain unexpected knowledge from the foregoing longitudinal

survey studies on approximately 2,000 high school students in six countries (i.e., Japan, the United States, Germany, Korea, China, and Indonesia). For example, from the aspect of selection of occupation and course option, while students who "have not determined" their course option (course option indecision) naturally decrease in number, students except those in Korea and Indonesia tend to reduce their scores on nearly all vocational view scales compared to those in their first year in high school generally when they enter the third grade. However, education curriculum (general and vocational subjects) and employment support of schools (for vocational-course students) significantly acted as educational and educationally environmental factors.

Furthermore, in order to prepare for the project applied this time, the applicant conducted interview surveys for several undergraduate students each of whom had looked for a job in a university in Germany and the United States during this summer and early fall on their academic learning and career-related activities. (The applicant publicized the surveys at the 53rd Meeting of the Japan Society of Technology Education on October 21, 2012.) Although it was also unexpected in this case, the applicant strongly felt that they tended to positively connect technical subjects they learned for themselves and their part-time jobs with an occupation they would select in the near future.

3. Challenges during the term of this research

As a result, the project **narrows down** target students in **four countries** such as Japan, the United States, Germany, and Korea to longitudinally track them from their first grade to graduation over the term from FY2013 to FY2016. Those subject to the surveys are (1) students of universities and (2) students of technical colleges (fachhochschule) or short-term higher vocational education institutions (including community colleges, vocational colleges, and technical schools). The applicant implements the following challenges for the activities of learning and living of these students.

Challenge 1: The applicant conducts a statistical survey separately of the students of short-term higher education institutions and those of four-year universities on their desired occupation, vocational view (criteria for occupation selection), status of taking and passing courses of technical learning, status of acquisition of vocational qualifications and competency certifications, practical training at companies, extracurricular activities, part-time job experience, and vocational competency level (i.e., executable job and the level, and self-assessment of job performance), and identifies their changes and development, and the factors thereof.

Challenge 2: The applicant selects a few students from those who cooperated in the survey in Challenge 1 to conduct a qualitative survey of them, analyzes their occupational selection and vocational view, status of acquisition of vocational skills, and the cause and effect of the background factors, according to the activities of daily living of each individual student that cannot be seen from quantitative surveys, and focuses on their technical learning and work experience including part-time jobs.

Challenge 3: The applicant classifies and compares statistical data on (1) and qualitative data on (2) from perspectives, including by country, by subject and by department at their former high school, by gender, and by chronological order. By this, the applicant clarifies mainly the

differences in the significance and the commonalities between university courses and the activities of daily living of students in each country: particularly, it clarifies whether, as generally believed, Japanese students tend to develop fundamental and versatile competencies rather than technical competencies, have a lower level of vocational skills and vocational view, and tend to belong to a company/group compared with European and American Students.

4. Creativity of the project

The project is **a longitudinal study** intended to build upon past studies on the processes in which high school students shaped their vocational view and, consequently, **track the** entire formation of vocational skills and fundamental competencies and shaping of the vocational view of students in the higher education stage including high school students of previous study (i.e., current undergraduates), and the project itself is considered rare in the fields of psychology, educational sociology, and theory of secondary and higher education. The project has a methodological feature compared to past projects in terms of adopting the "Learner-centered Approach" (OECD, 2000), i.e., adopting the approach to identify the processes to form vocational competencies in accordance with the entire contents of **the learning process, activities of daily living, and living hours of students themselves**. Furthermore, although there were previously some statistical international comparative surveys conducted from the perspective of relevance between higher education and life at work (occupational category etc.) (The Japan Institute for Labor Policy and Training, *Japanese- European Comparative Studies of Higher Education and Occupation*, 2001 / Yoshimoto, *Comparative Study of Higher Education and Competency Development in European and Japan*, 2004), **international comparative surveys incorporating qualitative surveys** that include Korea belonging to Asia and having a growing economy, and that local researchers participate in have the potential to reshape the results of slightly outlined and general past surveys.

II. Research Plan and Methods (Overview)

Fundamental Method 1: The applicant pursues surveys of literature and materials on higher education systems and trends in each country, particularly on the frameworks of learning courses, career support by universities, and general and characteristic manners of student life to share a common understanding between the members of the project and joint researchers.

Fundamental Method 2: Like longitudinal questionnaire surveys, the applicant prepares question items and living hour sheets for longitudinal interview surveys.

Challenge-specific Method 1: In response to **Challenge 1**, the applicant conducts the same questionnaire survey twice for students of short-term higher education and those of four-year universities, respectively, followed by analyses and observational studies on changes in the qualitative and quantitative aspects.

Challenge-specific Method 2: In response to **Challenge 2**, the applicant picks out a few students by gender, by subject at their former high school, by the department to which they currently belong, by desired occupation, etc. to conduct interview surveys on their learning and activities of daily living.

Challenge-specific Method 3: In response to **Challenge 3**, the applicant conducts analyses of qualitative data by coding and classifying patterns, and analyses of variance and repeated measurement of quantitative data by factor analysis and factor scale to conduct observational studies and comparisons by country, by gender, by major, and by chronological order.

1. Project organization and implementation image throughout the term

The project is implemented with the **project organization shown in the figure on the following page** throughout the term of the project.

The representative not only manages overall project planning and progress, but also becomes directly involved in all challenges and takes responsibility for conducting research and studies, questionnaires and interviews, and analyses and observational studies thereon. **Shintani** (Yokohama National University) is a leading authority on the study of technical colleges, **Yoshikawa** (National Institution for Academic Degrees and University Evaluation) is an expert in the evaluation systems for Japanese and European (German) universities, **Shimizu** (Kansai University) is a leading researcher of factor and longitudinal analyses, and **Sakamoto** (Aichi Institute of Technology) is familiar with participant observation and interview methods.

In addition to these, overseas collaborators of the project are appointed as local researchers at their own university or neighboring higher education institutions. Korean **Lee, Sang-Ming** (Korea University) is an expert in career counseling and **Lee, Myung-Hung** (Chungnam National University) is an expert in vocational education. German **Eswein, Mikiko** (the University of Kaiserslautern) is an expert in the theory of human resource development and **Demes, Helmut** (University of Duisburg-Essen) is an expert in vocational education. American **Zirkle, Christopher** (the Ohio State University) is an expert in the theory of school administration and **Popovich, Jack** (Columbus State Community College) is an expert in the theory of higher education management.

2. Planning for FY2013

(1) In the first fiscal year, the applicant jointly and extensively reads reports on surveys of literature on **Fundamental Method 1 and Fundamental Method 2** set forth on page 3 and reports on related surveys existing in each country to grasp the levels of advance studies and surveys as well as the current status of the relevant project themes with all members of the project. For this purpose, the members and collaborators of the project share the foregoing work and hold a meeting for survey and design for Challenge-specific Method 1 and 2 in the middle of FY2013 in Nagoya.

(2) In the latter half of the first fiscal year, the members and collaborators of the project conduct a few preliminary surveys in accordance with the definitely-planned questionnaire sheet, semi-structured interview item sheet, and living hour sheet (entry slip). (The questionnaire sheet will be sent out to approximately 50 students in each country and interviews will be conducted with a few students.)

(3) The applicant quickly validates the survey items and methods for slight modification of them, and subsequently formulates final survey items and planning to conduct the first

questionnaire survey (for all target students) and interview surveys (only for short-term students) within FY2013. For the first practical survey conducted overseas, the representative plans to go to the relevant country himself also to request collaborators from whom overseas collaborators of the project obtain their collaboration on the survey site, thus implementing an informed consent procedure.

Higher education institutions to which students subjected to the practical survey belong and the number of participant students are planned as follows:

Japan: For questionnaire surveys, the applicant plans to select approximately two schools and 150 participants in the surveys each from universities, technical colleges, and vocational schools in Kanto, Chubu, and Kinki regions taking into account the category of students to conduct the surveys: humanities or profession and their gender. For interview surveys, the applicant takes into account the category of profession and gender of students to select approximately 10 students each by category **including a few students who participated in the surveys on high school students in 2009 and 2011.**

Korea: For universities and colleges in Seoul Special City and Daejeon Special City, the applicant secures the number of participants following the same method as that in Japan to conduct the surveys.

USA: For universities and community colleges in Columbus City and cities in the West Coast region, the applicant secures the number of participants following the same method as that in Japan to conduct the surveys.

Germany: For universities and colleges in Kaiserslautern City or Heidelberg City and Duisburg City or Essen City, the applicant secures the number of participants following the same method as that in Japan to conduct the surveys.

Survey items are consulted with the general conference. With regard to **occupational selection and occupational view**, the applicant refers to the scale of occupational view for surveys by generation issued by the Employment Advance Research Center (*Occupational View and Career of New Generations*, 2002), scales of long-term longitudinal studies for occupational selection of engineering students in the USA by Lent, R.W., etc. (central to the Academic and Political Background of the Study on page 1), and the survey items of the German Association of Higher Education Information Systems (Bridis, K., *Übergänge und Erfahrungen nach dem Hochschulabschluss*, 2007) on the basis of 31 qualitative variables and 30 quantitative variables for occupational selection and occupational view used in questionnaire surveys conducted by the authors in 2009 and 2011 (posted in 3 of List of performance in 2012).

With regard to the **formation of vocational skills**, the applicant refers to categories of competency elements ("Technical Knowledge and Competencies", "Versatile Competencies", and "Self-awareness"), and categories in "Technical Knowledge and Competencies" ("Specific knowledge", "Understanding and application", and "Analysis, comprehension, and evaluation") by Kaneko (2012, see the bottom of the above page 1), or three elements of technical competencies (knowledge, skills, and competences) and criteria for competency level categories in these elements

used in the European Qualifications Framework, (European Community, *The European Qualifications Framework for Lifelong Learning (EQF)*, 2008) to use the student self-rating scales and objective/social evaluation indicators such as academic learning attainment level, qualification/competency evaluation (review) experience, and work performance (experience).

3. Planning for FY2014 or later and action to be taken planning fails

FY2014 (Second year)

(1) The applicant conducts analyses of data obtained in FY2013 (First year).

(2) For students of two-year schools such as community colleges in the USA and vocational schools and technical colleges in Japan, the applicant conducts the second questionnaire survey and interview survey in the second half of the fiscal year.

(3) The applicant conducts the first interview survey on the students of four-year schools.

FY2015 (Third year)

(1) The applicant conducts analyses and observational studies on data obtained in FY2014.

(2) The applicant held an international workshop for interim reporting of study results combining it with the exchanges of study results and the ex-post facto coordination of study planning. After that, project members and collaborators make a presentation at domestic and overseas academic conferences, etc.

(3) The applicant conducts the second questionnaire survey on the students of four-year schools in the first half of the fiscal year.

FY 2016 (Fourth (i.e., Last) year)

(1) With regard to the results of the second questionnaire surveys, the applicant conducts longitudinal analyses at 2 locations (by the repeated measurement method), analysis of causes and effects for changes in occupational selection and occupational view, and transitions in learning and activities of daily living of students to make comprehensive comparisons by country, by educational institution, and by gender.

(2) The applicant holds a rather large-scale international conference including the exchange of study results by country that is open particularly to Japanese researchers.