Basic Research on Curriculum Organization
Report No. 7: Overview of "principle of curriculum organization towards comprehensive development of competencies"

1. Purpose and Overview of the Research

(1) Purpose of the Research

This four-year research (FY2009-2013) aimed to provide options for the development of future curricula from the viewpoint of cultivating the competencies required in the rapidly changing society in the era of globalization. The study was carried out in cooperation with the Ministry of Education, Culture, Sports, Science and Technology (MEXT).

The proposal of our recent Report (Report No.5[1], 2012) including the provisional vision of competencies required in the future society, i.e., "21st century competencies" (as tentatively called) had got valuable feedback from scholars, schools and educational institutions. In response to the call for academic and theoretical foundations, this Report No.7 dealt with theoretical investigations in order to explore the theoretical background of our proposals in addition to the present issues surrounding the curriculum reform in Japan and practical case studies in schools.

(2) Overview of the Research

The previous studies (until FY2012) discussed mainly the issues on educational objectives. After FY2013, we studied means to enhance possibilities of developing competencies focusing on educational contents and methods. In particular, we reviewed how the competencies were incorporated in the current Courses of Study, made a comparison with cases from overseas (e.g. Australia, New Zealand, Finland and the U.K.), explored the learning theories and looked into some practices for the development of competencies in schools. Based on the results, we identified the issues and challenges for developing competency-based curriculum in Japan.

2. Outline of Research Results

The second chapter examines and reviews competencies required for the future society. We also analyzed the objectives and targets in educational laws and ordinances including the Fundamental Law of Education and the School Education Law.

In the third chapter, we explored how competencies are described in the current Courses of Study. In the result we found the followings. The Course of Study: (1) holds a set of competencies ("Zest for living") as basic philosophy and illustrates its constituents, (2) aims to develop competencies through various means (such as indicating necessary learning activities, emphasizing indicative verbs that are key to learning activities, and suggesting learning process models), (3) displays learning activities/process as a bridge between learning contents (knowledge/skills) and competencies to be fostered, as much as the

description of learning activities varies depending on the characteristics of each subject and the levels of schools, and (4) promotes systemization and structuring of educational contents.

In the fourth chapter, we compared the trends in educational reform internationally to draw out implications for the curriculum reform in Japan. This comparative study showed that educational reform based on competencies is now almost a global trend. It is considered that DeSeCo project and others have a large effect on such trends, especially due to discussions on the development of competencies in the early 2000s. Meanwhile, it was indicated that approaches to development vary depending on contexts of each country (e.g. history, culture, system and situation) and insights learned should be reviewed and scrutinized in order to adapt them to the different context like Japan.

In addition, we went deeply into the curriculum standards/contents and structures of Australia, New Zealand and the U.S. (NGSS) from the aspect of the relationship between school subject contents and competencies, while examining trends in Finland and the U.K., which have been facing a backlash after introducing competencies-based curriculum ahead of other countries. The surveys showed that some countries are more conscious of relationships among contents of the subjects, learning activities/process and competencies.

The fifth chapter examined the relationship between learning of school subject contents and gaining of competencies by referring to relevant basic theories and practical researches.

First, taking into account insights from pedagogy and psychology, we confirmed the definition of "competencies" includes not only high-quality knowledge and skills related to contents of school subjects but also meta-cognition, social skills and attitudes focusing on how to use the high-quality knowledge and skills.

Next, referring to recent reviews on learning theory, we overviewed learning-related basic theories from the aspects of conceptual changes, problem solving, expertise and interaction. We also reviewed researches that aim to develop students' higher cognition and social skills, which are at the core of competencies. We examined the relationship between understanding of learning contents and development of competencies, and the effectiveness of educational supports for such learning. The study concluded that competencies can be developed as targets and they can also be useful as a means to understand learning contents. In addition, the study indicated that setting meaningful tasks, having resources including "means" to solve these tasks, and preparing learning opportunities where students can exchange their ideas and have more interactions are essential when organizing a curriculum to develop competencies. Seven important viewpoints were presented regarding the above: (1) children learn from meaningful contexts, (2) children have their own ideas to build upon, (3) children can develop their ideas through conversation, (4) external resources including educational materials are essential and necessary for thinking deeply, (5) means (learning strategies) are useful when children feel them as necessary, (6) children realize the importance of learning activities by using and reflecting them repeatedly, and (7) a culture of "learning from each other" in classroom or at school helps children learn

more easily and deeply.

In the sixth chapter, we examined implemented practices at the Japanese schools to find what competencies are being developed and in what ways competencies are being evaluated.

First, we identified learning activities which correlate highly with performance indicated by the results of the National Assessment of Academic Ability, and confirmed that those learning activities include the seven viewpoints introduced in Chapter 5. We also found that one of the characteristics of lessons at Japanese schools is the "orchestrated lesson" (all students deal with the same tasks and present and discuss solutions in class).

Having attended actual lessons at the schools as a practical example, we analyzed practices from the aspects of "the relation between cognition and meta-cognition" and "the relation between learning contents and lesson styles." Accordingly, it was suggested that, regardless of lesson style, understanding different ideas that exist among the students and are shared in class is a key to deepen each student's ideas. Furthermore, we analyzed the curricula of experimental schools in order to find out characteristics of the curricula that can support the development of competencies.

Finally, in the seventh chapter, we reviewed the findings described above, and identified future challenges when considering principles of the Course of Study that allow organization of a highly effective curriculum at schools. The summary of such reviews are as follows:

○ Generalizing curricula goals, education contents and learning methods, and practical researches in other countries, it was found that competencies and contents of school subjects (contents) are not mutually exclusive, and developing them in an integrated way is desirable.

○ Studying the relations between contents of school subjects and learning methods (learning activities/process), it was suggested that deep understanding of concepts and essence of subject matters will help students "utilize knowledge and skills," and that meta-cognition of learning methods when learning contents, including cooperative and collaborative learning, will support the development of "ability to create values as an individual in cooperation with other people."

➢ To achieve the above mentioned purposes, it is suggested that refining and structuralizing "things involved in essence of school subjects" and "things associated with knowledge specific to each subject, and individual skills" (especially distinguishing "understanding the meaning of conceptual knowledge" and "acquiring each knowledge and skills") about educational goals and contents of each subject, are effective.

○ It was indicated that describing educational goals using the formula, "students acquire competency Z] by learning [knowledge/skill X] through [learning activity Y]," is effective.

○ While specifying "what you want children to be able to do" using the formula, "they acquire [competency Z] by learning [knowledge/skill X] through [learning activity Y]," evaluations are increasingly asking "what children can do" in addition to "what children know."

○ On the other hand, some overseas countries and researches of practices assess knowledge/skills

and competencies in a more integrated manner by, for instance, considering how much the former is acquired by using the latter rather than considering knowledge/skills and competencies as two different sets of scales (e.g. the former is for a written exam and the latter for an interview).

○ There is a trend to appreciate the learning process in addition to the end point (outcome) of learning. That assessment trend is considered to have some advantages: direct assessment of students' performance related to the question "what problems children can solve" is possible; assessment results are usable for teaching next time; the personalization of education, such as teaching considering the different character of a student, will become easier by understanding the diversity of students.

○ It was shown that understanding the following points are crucial in order to organize a highly effective curriculum at each school: how to reflect components of competencies goals in curriculum standards, how to connect those components with goals/contents of school subjects depending on school levels and grades, how to support lesson design in a more specific manner and how to illustrate assessment methods.

○ To develop competencies the importance of ingenuity regarding educational goals, methods and assessment at classroom is indicated. Placing a guard to school curricula in overseas schools, an advocate of "forward-looking approach" in the 21st century skills project, and growing recognition of curriculum management in Japan are examples of them.

3. Future Prospects

The Ministry of Education, Culture, Sports, Science and Technology set up the "Committee on Evaluation of Educational Goals/Contents considering Competencies to be Developed" in December, 2012. After discussing key points to be emphasized as a framework for a future Course of Study based on competencies to be developed referring to "21st century competencies" proposed in this study project, the committee submitted the "Summary of Issues" on 31st of March in 2014. We need to reflect these issues and make a new proposition of "21st century competencies" in light of the key opinions identified by the committee. Further, we are required to provide more concise and practical guideline so as to promote our proposal widely among schools.

Therefore, the forthcoming report will reintroduce "21st century competencies" in accord with past research results and "Summary of Issues," and will offer basic data that contribute to future discussions to review standards of curriculum. We will make some specific suggestions for practices at schools as well.

[Reference] "21st century competencies" (as tentatively called)

"21st century competencies" (as tentatively called) was introduced in Report No.5 (below). This idea aims to effectively foster "zest for living," basic philosophy of Course of Study. We derived "21st century competencies" from three factors: academic ability, richness in humanity and sound body that constitute "zest for living" while paying attention to competencies to be developed in a cross-subject manner, and created a diagram consisting of three layers: "basic skills" "thinking competency" and "practical competencies."

"21st century competencies" (as tentatively called) has three layers of: thinking competency which is central, basic skills that support thinking competency, and practical competencies to choose and decide how to use thinking competency. Practical competencies are considered to respond to zest for living.

More specifically, "basic skills" mean skills to use language (i.e. literacy), number (i.e. numeracy) and information (i.e. ICT literacy) for any purposes. "Thinking competency" is competency with which each student learns, judges, develops his/her own ideas by himself/herself, discusses with other people, compares/scrutinizes and integrates ideas so as to create better solutions and new knowledge. This "thinking competency" also means ability to find the next question. "Practical competencies" are those with which a student can raise questions in daily life/society/environment, and derive valuable solutions to communities, society and him/herself as well by fully mobilizing his/her knowledge. "Practical competencies" are also defined as those that enable students to deliver their own ideas to society and to recognize the significance of other people and society by collaboratively working together with others for better solutions.

(For more details, see "Basic Research on Curriculum Organization: Report No.5 'Fundamental Principles for Curriculum Organization to Develop competencies to cope with Social Changes'" by National Institute for Education Policy Research (2012 Project Research Results Report, http://www.nier.go.jp/kaihatsu/pdf/Houkokusho-5.pdf))

Zest for living
21st Century Competencies

Practical competencies
(Autonomy, Relationship, Active citizenship)

Thinking Competency
(Collaborative problem solving etc.)

Basic Skills
(Literacy, Numeracy, ICT literacy etc.)