

Promotion of In-service Teacher Training for Curriculum Management: with Focus on Capacity Building for Media and ICT Education

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Abstract—In-service and pre-service teachers in Japan are required to promote effective curriculum management at each school in order to develop effective school curricula. This study purposed to promote in-service teachers' understanding and skills of curriculum management, and to evaluate in-service teachers' attitude toward curriculum management. Participants were 54 elementary and secondary school teachers working in educational institutes. All of the participants took part in "Media Specialists Training Course" which was held by the MEXT. Results of the study indicate that participants who took part in the "Media Specialists Training Course" enhanced their understanding and skills in curriculum managements through lectures on curriculum management and developing curricula using the "Curriculum Standards" ($\chi^2(1) = 40.71, p < .01$). Results also suggest that participants realized the significance of developing curricula that suit trainees' or students' needs, they noticed that it is important for school teachers to promote their understanding and skills for curriculum management, and they gained willingness to develop teacher training curricula.

Index Terms— curriculum management, In-service teacher training, media education, "Educational media teacher training curriculum standards"

I. INTRODUCTION

The development of the information society has radically changed educational environments. In order to cope with the highly-sophisticated information society, the Strategic Headquarters for the Promotion of an Advanced Information and Telecommunications Network Society (hereinafter referred to as Strategic Headquarters) announced "A New Strategy in Information and Communications Technology (IT)" on May 11th, 2010 and ordered the Government of Japan to develop a school system that fits the reality of the 21st century. The Strategic Headquarters required schools to utilize ICT 1) to develop easy-to-understand classroom lessons and activities in which children teach and learn from one another, 2) to reduce burden on teachers and school staffs, and 3) to expand children's capacity to utilize

information. Furthermore, the Strategic Headquarters required the Japanese Ministry of Education, Culture, Sports, Science and Technology (hereinafter abbreviated to MEXT) to establish a basic policy for the informatization of education [1].

Responding to the Strategic Headquarters' announcement, MEXT announced "The Vision for ICT in Education" on April 28, 2011. The Vision focuses to take full advantage of the features of ICT in order to provide education to foster abilities required for children who will lead the 21st century [2]. MEXT stressed that utilization of ICT in education aims to promote quality of education in 1) cultivating students' ICT literacy, 2) designing and utilizing ICT in classroom instruction in order to deliver easy-to-understand classes, and 3) utilizing ICT for school administrative works in order to enable information sharing and to reduce teachers' and school staffs' burden.

To meet the goal of the Vision, the Government of Japan aims to make all teachers ICT literate. However, the results of the "Countrywide Survey on the Situations of Informatization of Japanese Schools" announced by MEXT in October, 2010 shows that only 73.9 percent of the teachers can use ICT for class preparation, class evaluation and educational research, 58.5 percent can utilize ICT in classroom lessons, 60.3 percent can foster students' ICT literacy, 68.6 percent can cope with and teach moral issues in ICT, and 69.4 percent can utilize ICT for school affairs [3]. According to the results of the countrywide survey announced in October, 2015, the percentage of ICT literate teachers has improved [4]. However, still only 82.1 percent of the teachers can use ICT for class preparation, evaluation and educational research, 71.4 percent can utilize ICT in classroom lesson, 65.2 percent can foster students' ICT literacy, 77.7 percent can cope with and teach moral issues in ICT, and 78.2 percent can use ICT for school affairs.

The Strategic Headquarters then announced a "Declaration to be the World's Most Advanced IT Nation" that was decided by the Cabinet on June 14th, 2013. The strategy is intended to "create an IT user society at the world's highest levels and disseminate the results globally through a five-year process (by 2020)" [5]. The Strategic Headquarters ordered elementary and secondary schools to equip high-speed broadband,

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wireless LAN, one computer per student, interactive blackboards, digital textbooks and other educational materials to get students in touch with ICT. In concurrence with equipping schools with ICT, the Strategic Headquarters also required MEXT to develop teachers' capacity to integrate ICT in education, and develop ICT integrated teaching and learning models in order to take full advantage of the ICT equipped educational environments.

A. Curriculum Standards for Media and ICT Education

Capacity building and professional development along with infrastructure improvement are vital factors to enhance the quality of education. Therefore, MEXT has been making efforts 1) to develop an effective and well-structured media education teacher training curricula, 2) to promote in-service and pre-service teacher training at the local and national level, and 3) to motivate teachers to take the training courses. For example, the MEXT developed "Educational Media Teacher Training Curriculum Standards" (hereinafter abbreviated as "Curriculum Standards") in 1973 with the purpose of promoting in-service teachers' knowledge and skills in media education [6]. The "Curriculum Standards" has been introducing knowledge and skills required for in-service teachers, teachers consultants, and educational staffs, and has been a reference material for regional curriculum planners for planning and organizing teacher training courses.

The "Curriculum Standards" had been revised twice. The first revision of the "Curriculum Standards" was made in March, 1992 [7]. The revised "Curriculum Standards" incorporated new technologies such as computers, telecommunication systems and databases, introducing 93 teacher training courses.

The second revision of the "Curriculum Standards" was made in March 2006, and was announced by MEXT on November 24th, 2006 [8]. The current "Curriculum Standards" in consisted of four categories: training courses, training topics, training sub-topics, and training contents. If a training course can be compared to a learning subject, a training topic can be compared to a study unit, a training sub-topic is a lesson, and a training content is a learning activity. The relationship of the training courses, topics, sub-topics, and training contents can be described as follows:

- Training Course: Internet
 - Training Topic: Utilizing the Internet in Education
 - Operating the Internet
 - Operating Communication Tools
 - ◇ Training Sub-topic: Using Web-based E-mail
 - ◇ Using Electronic Bulletin Board Systems
 - ◇ Blogging
 - Training Content: Functions and Roles of Blogs
 - Setting up Blogs
 - Managing Blogs

The "Curriculum Standards" consists of 22 training courses with 74 training topics, 317 sub-topics and 1,065 training contents.

Along with the "Curriculum Standards," 56 "model training courses" were introduced as reference material. These "model training courses" aim to be a guideline for regional curriculum planners in developing media/ICT teacher training courses. In other words, the "model training courses" are sort of "teacher training course exemplars" or "recommended training course courses". Table I is an example of a "model training course."

TABLE I. EXAMPLE OF A "MODEL TRAINING COURSE" (ORIGINALLY FROM JAVEA, 2006, P.90, TRANSLATED BY AUTHOR)

Course Title : Internet Safety		
Aim of the Course: Acquire knowledge and skills to promote safety on the Internet		
Course Objectives: With the growth of Internet usage, new issues such as e-mail related problems, personal information leakage, and security issues have emerged. In this training course, participants will acquire knowledge and skills to promote and maintain safety on the Internet, and ways to deal with Internet-related issues.		
Duration: 12 hours (2 days)		
Course Contents:		
Training Courses	Training Topics/Subtopics	Hours
Moral Issues, Copyright Issues, Network Security	Moral Issues and Netiquette Meaning and Contents of Moral Issues Netiquette (Websites, BBSs, and E-mails) Rules and Moral Principles in the Network Society Communication Manners (Manners and Rules for Chatting and Using E-mail)	4 hours
	Protection of Personal Information Preventing Personal Information Leakage	2 hours
	Network Security Types and Features of Computer Viruses, Worms, and Trojan Horses Protection from Computer Viruses, Worms, and Trojan Horses Types and Features of Spywares, Adware, and Keyloggers Protection from Spyware, Adware, and Keyloggers Network Security Vulnerability Assessment Types, Features and Functions of Firewalls Utilization of Firewalls Blocking Unwanted Junk/Spam Mail	4 hours
	Protection from Hazardous and/or Harmful Websites Trends and Issues in Hazardous and/or Harmful Websites Detecting and Blocking Hazardous and/or Harmful Websites	2 hours

B. Curriculum Management in Japan

The term “curriculum management” was first presented to elementary and secondary school teachers in Japan by the Central Council for Education in “Tactics to Improve Curricula and Instruction for Elementary and Secondary Education: Report [9].” The Council requested school principals and teachers to further their understanding of the “Courses of studies” —a national education guideline for elementary and secondary education in Japan— and their school curricula, and to promote their understanding and skills in curriculum development and curriculum management.

In 2008, the Central Council for Education illustrated the significance to popularize the concept of curriculum management in “Improving ‘Courses of Study’ of Kindergartens, Elementary Schools, Lower and Upper Secondary Schools, and Schools for Special Needs Education: Report [10].” The Council ordered curriculum administrators 1) to provide teachers practical examples of what the “Courses of Study” puts major emphasis on, 2) to improve the educational environment so that teachers have enough time to communicate well with students, 3) to develop and implement reality-based school curricula, 4) to properly assess educational outcomes, and 5) to improve educational activities based on the basis of school assessment. That is to say, curriculum administrators are required to manage curricula using a Plan-Do-Check-Act (PDCA) cycle.

Furthermore, in the “Curriculum Standards for Elementary and Secondary Education: Inquiry,” Education Minister Shimomura proposed to the Central Council for Education to promote effective curriculum management at each school by aligning the process of planning, implementing, assessing, and improving curricula along with the revision of the current “Courses of Study [11].”

Under these circumstances, it is necessary to enhance in-service and pre-service teachers’ understanding and skills in curriculum management in order to develop valid and effective curricula for media /ICT education. Therefore, this study purposed to promote in-service teachers’ understanding and skills of curriculum management through teacher training using the “Curriculum Standards.”

II. PURPOSE

The purpose of the study is to promote in-service teachers’ understanding and skills of curriculum management, and to evaluate in-service teachers’ attitude toward curriculum management.

The research questions to be addressed in this study are: 1) What effects do in-service teacher training and the “Curriculum Standards” have on in-service teachers’ skills of curriculum management? 2) What effects do experiences of developing a curriculum have on in-service teachers’ attitude toward curriculum management? 3) How useful and usable is the “Curriculum Standards” as a reference material for curriculum management?

III. METHOD

The study was conducted from October 4th, 2013 with the purpose of promoting in-service teachers’ understanding and skills of curriculum management through teacher training.

A. Participants

Participants were 54 elementary and secondary school teachers working in educational institutes. All of the participants took part in the “Media Specialists Training Course” which was held by MEXT.

B. Instruments

Four instruments were used to enhance and assess participants’ understanding and skills of curriculum management. The “Curriculum Standards” was used as a reference material for curriculum management. Table II shows the structure of the “Curriculum Standards” at the training courses and training topics level.

TABLE II. STRUCTURE OF THE “EDUCATIONAL MEDIA IN-SERVICE TEACHER TRAINING CURRICULUM STANDARDS” (ORIGINALLY FROM JAVEA, 2006, PP. 30-31, TRANSLATED BY AUTHOR)

Training Courses	Training Topics
1. General Theories of Educational Media	1. Trends and Issues of Educational Media
	2. Utilizing Educational Media
	3. Managing and Operating Educational Media
	4. Media Literacy
2. Detailed Theories of Educational Media	5. Utilizing Media in Education
3. Educational Broadcasting	6. Utilizing Educational Broadcasting
	7. Trends in Educational Broadcasting
	8. Video and TV Program Production
4. School PA Systems	9. Utilizing School PA Systems
	10. Installing and Operating School PA Systems
5. Audiovisual Aids	11. Utilizing 16 mm Movie Projectors
	12. Utilizing Slide Projectors
	13. Utilizing Overhead Projectors
	14. Utilizing Visual Presenters and Overhead Cameras
	15. Utilizing DVD/HDD Recorders
	16. Utilizing Large-screen LCD TVs and/or PDP TVs
	17. Producing Slides and Projection Materials
	18. Utilizing Slides and Projection Materials
6. Audiovisual Materials	19. Producing and Utilizing Still Images
	20. Producing Video Materials
	21. Operating Digital Cameras
	22. Utilizing Printers
7. Recording Materials	23. Producing Sound Recording Materials
	24. Producing Video Recording Materials
	25. Producing and Utilizing DVDs and CDs
	26. Utilizing Sound Recording Materials
	27. Utilizing Video Recording Materials

	28. Utilizing VOD Systems
8. General Theories of Computers	29. Overview of Computer Aided Education
	30. Computer Hardware
	31. Computer Software
	32. Basic Computer Skills
9. Word-processing Software	33. Utilizing Word-processing Software in Education
	34. Operating Word-processing Software
10. Spreadsheet Software	35. Utilizing Spreadsheet Software in Education
	36. Operating Spreadsheet Software
11. Digital Presentation	37. Utilizing Presentation Software in Education
	38. Operating Presentation Software
12. Database Software	39. Utilizing Database Software in Education
	40. Operating Database Software
13. Hypermedia/Multimedia	41. Utilizing Hypermedia/Multimedia in Education
	42. Developing Hypermedia/Multimedia
14. Computer Networks	43. Utilizing Computer Networks in Education
	44. Operating Computer Networks
	45. Managing Computer Networks
15. The Internet	46. Utilizing the Internet in Education
	47. Operating the Internet
	48. Operating Communication Tools
16. E-mail	49. Utilizing E-mail in Education
	50. Operating E-mail Programs
17. Websites	51. Utilizing Websites in Education
	52. Operating Websites
18. Educational Software	53. Utilizing Educational Software
	54. Utilizing Groupware in Education
19. Moral Issues, Copyright Issues, Network Security	55. Moral Issues and Netiquette
	56. Copyright Issues
	57. Protection of Personal Information
	58. Network Security
	59. Rating and Filtering Information
	60. Protection from Hazardous and Harmful Websites
20. Distance Education	61. Utilizing Videoconference
	62. Utilizing E-Learning (WBL)
	63. Utilizing the el-Net
	64. Utilizing Electronic Whiteboards
	65. Utilizing GPSs, Navigation Systems
	66. Utilizing Handheld Terminals
21. Regional Media Planning and Media Centers	67. Meanings and Management of Audiovisual Centers/Libraries
	68. Managing and Operating Media in Schools
	69. Utilizing CATV
22. Training Courses for Teacher Trainers	70. The Structure of the "Educational Media Teacher Training Curriculum Standards"
	71. Creating Training Manuals
	72. Problems in Organizing Training Courses

	73. Establishing Regional Cooperation Systems
	74. Evaluating Training Courses

A worksheet was used to evaluate participants' performance in curriculum management. Fig. 1 shows the outline of the worksheet that was used in this study.

Course Title:

Aim of the Course:

1. Course Objectives :

2. Targets: ()

3. Hours: () hours (() days)

4. Course Contents:

Training Courses	Training Topics	Training Subtopics	Hours

Figure 1. Outline of the worksheet used in this study (Translated by author)

Two questionnaires were used to assess participants' attitude and opinions on curriculum management.

C. Procedure

All of the participants attended the "Media Specialists Training Course" held by the MEXT. Participants first got lectured on theories and methods of curriculum management. Then, they were lectured about the structure and how to use the "Curriculum Standards." Thirdly, trainees chose one from the three topics that were presented to them, and designed an educational media teacher training curriculum referring to the "Curriculum Standards". After that, participants presented the training curricula they designed and then, answered to the questionnaire. The in-service teacher training course for curriculum management was structured as follows:

1. Lecture on curriculum management: 50 minutes
 2. Lecture on the structure and use of the "Curriculum Standards": 20 minutes
 3. Needs assessment for media education in each city or prefecture: 20 minutes
 4. Curriculum development on media education: 60 min.
 5. Presentation and peer evaluation of the curriculum developed by the: participants: 20 minutes
 6. Questionnaire on the experience of curriculum management: 10min.
- Total: 180 minutes

IV. RESULTS

All of the 54 participants completed the questionnaire. This means that the response rate was 100.00 percent. Hereinafter, results of the 54 answers will be introduced.

A. Participants' Profile

Table III shows the breakdown of participants by gender and occupation.

TABLE III. PARTICIPANTS' PROFILE

Profile of participants		F	%
Gender	Male	49	90.74%
	Female	5	9.26%
	Total	54	100.00%
Occupation	Elementary school teacher	19	35.19%
	Secondary school teacher	21	38.89%
	Teachers' consultants	14	25.93%
	Total	54	100.00%

B. Participants' Experience and Performance in Curriculum Management

All of the 54 participants who participated in the in-service teacher training course developed a curriculum on media education. More than 70 percent of them mentioned that they had never experienced curriculum management before (see Table IV).

TABLE IV. PARTICIPANTS' EXPERIENCE OF CURRICULUM MANAGEMENT

	Response	F	%
Experience of curriculum management	Yes	15	27.78%
	No	39	72.22%
	Total	54	100.00%

Among the 54 participants, 36 completed a curriculum on time referring to the "Curriculum Standards" (see Table V). Chi-square test was conducted to examine the relationship of participants' experience and performance in curriculum management. The result showed that participants' performance was significantly higher than expected ($\chi^2(1) = 40.71, p < .01$). A great number of participants (66.67%) completed a curriculum on time in portion to their experience in curriculum management.

TABLE V. PARTICIPANTS' PERFORMANCE IN CURRICULUM MANAGEMENT

Performance	F	%
Completed a curriculum on time.	36	66.67%
Developed a curriculum but was not completed on time.	18	33.33%
Could not complete a curriculum.	0	0.00%
Total	54	100.00%

Fig. 2 is an example of a curriculum that was developed by the participants.

Course Title: Basics Skills and Understandings of ICT Integration for School Teachers

Aim of the Course: Trainees will be able to design lessons using digital presentation software

1. Course Objective:
- Trainees will be able to identify when and how to use ICT devices in education.
 - Trainees will be able to integrate ICT devices including video projectors to classroom lessons.
 - Trainees will be able to make a presentation using digital presentation software.
 - Trainees will be able to evaluate classroom lessons using ICT.

2. Targets: (Secondary School Teachers)

3. Duration: (10) hours ((2) days)

4. Course Contents:

Training Courses	Training Topics	Training Subtopics	Duration
2. Detailed Theories of Educational Media	5. Utilizing Media in Education	5-1. Significance and Methods to Utilize Audio-visual Materials in Education	0.5 hours
		5-6. Significance and Methods to Utilize Multimedia in Education	
5. Audiovisual Aids	16. Utilizing Large-screen LCD TVs and/or PDP TVs	16-1. Current Situations and Issues in Utilizing Large-screen LCD TVs and/or PDP TVs	0.5 hours
		16-5. Utilizing Large-screen LCD TVs and/or PDP TVs in Classroom Lessons	
		16-6. Evaluation of Classroom Lessons Utilizing Large-screen LCD TVs and/or PDP TVs	
11. Digital Presentation	37. Utilizing Presentation Software in Education	37-1. Current Situations and Issues in Presentation Software in Education	0.5 hours
		37-2. Types, Features, and Functions of Presentation Software Utilized in Education	
		37-3. Theories and Techniques in Developing a Digital Presentation	
		37-4. Useful Techniques in Delivering a Digital Presentation	
		37-5. Evaluating a Digital Presentation	
	38. Operating Presentation Software	38-1. Designing a Digital Presentation	0.5 hours
38-2. Operating Presentation Software		3 hours	
38-3. Adding, Synchronizing, and Editing Media Elements for Digital Presentation		0.5 hours	
		38-4. Developing and Saving a Digital Presentation	0.5 hours
		38-6. Delivering a Digital Presentation	
Development and Presentation of ICT materials			4 hours

Figure 2. Example of a curriculum developed by the participants (Translated by author)

C. Participants' Opinions on Curriculum Management

A free-response style self-report questionnaire was used to identify participants' opinions on curriculum management. The main results of the questionnaire survey were as follows:

- It is significant for school teachers to develop their understanding and skills for curriculum management through teacher training.
- I realized that it is important to develop training curricula that suits teachers' needs.
- I realized that it is important for teacher trainers to develop training curricula by themselves.
- The "Curriculum Standards" is a good reference material for developing teacher training curricula.
- The model courses are useful and usable reference for developing teacher training curricula.
- I would appreciate receiving more information about results and accomplishments of teacher training courses based on the "Curriculum Standards."
- I want to make use of what I have learned through this training course when I develop a teacher training curriculum.

- Most of the training topics of the “Curriculum Standards” are valid and useful but some topics should be revised or added.
- A manual or guideline of the “Curriculum Standards” is not needed if curriculum planners have an opportunity to experience curriculum management.

D. Participants’ Attitude toward Curriculum Management and the “Curriculum Standards”

Participants’ attitude toward curriculum management and the “Curriculum Standards” was evaluated by a six item questionnaire on a four-point Likert scale. Table VI shows participants’ attitude toward curriculum management and the “Curriculum Standards.” The mean was calculated by giving each of the Likert scale points a number value, where *strongly disagree* = 1, *disagree* = 2, *agree* = 3, and *strongly agree* = 4. Results indicate that participants who experienced curriculum management for media education found that the “Curriculum Standards” and the model courses introduced in the “Curriculum Standards” are useful and usable.

Results of the questionnaire survey show that 1) 98.15 percent of the participants mentioned that the “Curriculum Standard” is useful for curriculum management, 2) 94.44 percent of the participants replied that the “Curriculum Standard” is usable for curriculum management, 3) 96.30 percent said that the model courses are useful for curriculum management, 4) 96.30 percent mentioned that the model courses are usable for curriculum management, 5) 68.52 percent mentioned that a manual or guideline of the “Curriculum Standards” in needed, and 6) 100.00 percent replied that in-service teacher training on curriculum management is needed.

TABLE VI. PARTICIPANTS’ ATTITUDE TOWARD CURRICULUM MANAGEMENT AND THE “CURRICULUM STANDARDS”

Item	Mean
1. The “Curriculum Standard” is useful for curriculum management.	3.63
2. The “Curriculum Standard” is usable for curriculum management.	3.57
3. The model courses are useful for curriculum management.	3.69
4. The model courses are usable for curriculum management.	3.70
5. A manual or guideline of the “Curriculum Standards” in needed.	2.81
6. In-service teacher training on curriculum management is needed.	3.78

V. DISCUSSION

This study purposed to promote in-service teachers’ understanding and skills of curriculum management, and to evaluate in-service teachers’ attitude toward curriculum management.

Regarding the first research question “What effects do in-service teacher training and the “Curriculum Standards” have on in-service teachers’ skills of curriculum management?,” results of the study indicate that participants enhanced their understanding and skills in curriculum managements through lectures on curriculum management and developing curricula using the “Curriculum Standards” ($\chi^2(1) = 40.71, p < .01$).

Regarding the second research question “What effects do experiences of developing a curriculum have on in-service teachers’ attitude toward curriculum management?,” results of the questionnaire survey suggest that 1) participants realized the significance of developing curricula that suit trainees’ or students’ needs, 2) they noticed that it is important for school teachers to promote their understanding and skills for curriculum management, and 3) they gained willingness to develop teacher training curricula.

Regarding the third research question “How useful and usable is the “Curriculum Standards” as a reference material for curriculum management?” results of the questionnaire survey indicate that participants found the “Curriculum Standards” and the model courses are useful and usable for curriculum management.

VI. CONCLUSIONS

Results of the present study suggest that in-service teachers who experience the process of curriculum management gains understanding and skills that are required for developing a well-structured curriculum. Although 72.22 percent of the participants’ had never developed a curriculum before, 66.67 percent of the participants completed a curriculum on time, and all of the participants somehow completed a curriculum. Moreover, all of the participants strongly agreed or agreed that in-service teacher training on curriculum management is significant.

Given the findings of the study, it is expected to generalize valid and effective teacher training courses that enhance trainees’ understanding and skills in curriculum management. It is also important to collect and to introduce great examples of in-service teacher training courses for curriculum management. In matters of curriculum management for media education, it seems crucial to keep regional curriculum planners informed about the “Curriculum Standards” and to keep providing training courses in which regional curriculum planners can learn how to design and develop in-service teacher training courses using the “Curriculum Standards”.

As the participants of the present study were Japanese in-service teachers, it is recommended to use other samples from other ages, nationalities, and prior teaching experience. Especially, it is important to enhance pre-service teachers understanding and skills of curriculum management through teacher education courses delivered by teacher training universities. According to the “Promoting School Teachers’ Qualities and Abilities: Report, Tentative Draft [12]” which was announced on October 15th, 2015, the MEXT required teacher training universities in Japan to promote pre-service teachers

basic abilities to develop and manage school curricula. Attempts should be made to develop curriculum standards for capacity building, and to introduce good practices in capacity building for teacher education.

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