

Research on in-service training for teachers as continuous learners (2)

— Content of and measures related to in-service training —

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Abstract: The purpose of this study is to clarify the contents, method, and other ideas of in-service teacher training, its effect evaluation and the instruction for teaching supervisors which entail an element of independent and collaborative learning. Fifty-three educational committees of prefectural and city governments which have the authority to offer in-service teacher training that responded to the questionnaire (response rate: 46.49 %). The free descriptions about in-service teacher training and its effect evaluation were analyzed and considered by applying subject classification which is one of the text-mining approaches and classified into the following 10 clusters: group work, attendee, school, resolution, practice, theory, training, teaching plan, research discussion, and class. Also, the free descriptions about the instruction for teaching supervisors were analyzed similarly and classified into the following 6 clusters: visit, training, teachers, improvements, attendance, after in-service teacher training. On the basis these results, this study discussed the actual condition of in-service teacher training, its effect evaluation and the instruction for teaching supervisors.

Key words: teachers as continuous learners, in-service training for teachers, active learning

1. Introduction

Changes in society require the cultivation of “teachers as continuous learners.” The “Report on comprehensive measures to improve the qualifications and abilities of teachers throughout their entire career”, released by the Central Council for Education in August 2012, points out that, “It is essential for teachers to improve their practical teachings skills and to remain curious and to continue learning throughout their entire careers, because it is necessary to constantly update knowledge and skills as society evolves rapidly.” In addition, Tagawa (2016) describes the background in which “teachers as continuous learners” has become an issue as, “The basic structure is to respond to changes in society and to cultivate the skills for surviving such changes. ‘Teachers as continuous learners’ contribute to both such aspects.”

Regarding support for such “teachers as continuous learners”, the report released by the

Central Council for Education in August 2012 points out that, “It is necessary to implement integrated reform in order to continuously support teachers as continuous learners throughout their entire careers, through collaboration and cooperation with boards of education and universities.” Besides, according to Ohashi (2018), “The reality is that it is difficult to leave the improvement of teaching skills to each teacher.” In addition to self-improvement, deliberate and systematic training programs are also required. In this way, support is needed for “teachers as continuous learners,” and teacher training, in particular, is believed to be important.

Regarding teacher training, the “Report on improving the qualifications and abilities of teachers responsible for school education in the future: Building a community that cultivates teachers who learn and grow together”, released by the Central Council for Education in December 2015, suggests a shift toward teacher training that includes

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independent and collaborative learning elements.

However, the actual state of teacher training that includes independent and collaborative learning elements is not yet sufficiently understood, and the results have not yet been sufficiently verified. Therefore, Takahashi, Yonezawa, Suzuki, Osedo, Kinoshita, Osato, & Nakai (2018) used a questionnaire to survey the boards of education of prefectures, ordinance-designated cities, and core cities. Based on an analysis of the results, it was believed that the characteristics of the qualifications and abilities that should be acquired by “teachers as continuous learners” were strongly influenced by the report released by the Central Council for Education in 2012. Besides, regarding the characteristics of teacher training systems for acquiring the qualifications and abilities to be acquired by “teachers as continuous learners,” it was believed that training was organized systematically and that various opportunities for training were being secured. Further, it was believed that diverse and specific teacher training programs were devised in order to make learning by individual trainees and trainee groups both independent and collaborative. Also, it became clear that most boards of education and other organizations were conducting teacher training that included both independent and collaborative learning elements, and were verifying the results of such training. It was also clear that approximately half of these boards of education were providing training for the instructors who conducted such teacher training. Further clarification of the actual situation, therefore, became an issue to be addressed.

In this research, the authors will clarify and report on the specific content, methods, and measures regarding teacher training that includes independent and collaborative learning elements, and verification of the results of such training, as well as the content and measures regarding the training for instructors who conduct such teacher training.

2. Method

(1) Survey subjects and procedures

One hundred fourteen boards of education and other organizations in prefectures, ordinance-designated cities, and core cities that have the right

to train teachers were asked to respond to a questionnaire for a survey conducted from December 2016 to January 2017. The questionnaires were distributed by postal mail. Fifty-three responses were received (a response rate of 46.49%).

(2) Survey items

The survey items were as follows.

Question 1. What is your understanding of the types of qualifications and abilities to be acquired by “teachers as continuous learners”?

Question 2. What kind of teacher training system is being built in order for “teachers as continuous learners” to acquire the qualifications and abilities that you provided in answer to Question 1?

Question 3. What kinds of measures do you think are necessary for a teacher training program (training content, training methods, etc.) in order to provide both independent and collaborative learning opportunities to individual trainees and trainee groups?

Question 4. Are you conducting the type of teacher training program that you described in your answer to Question 3?
If so, describe the content and measures that are involved.

Participants who answered to Question 4 that they are conducting such a type of teacher training program were asked to provide additional information about the content and measures involved in such training (including the name of the training program, number of training sessions, training time, target trainees, and number of participants), in as much detail as they liked.

Question 5. After conducting the type of teacher training program that you described in your answer to Question 3, do you verify the results? If so, describe the specific method and measures involved.

Participants who answered Question 5 that they verify the results of their teacher training program were asked to provide additional information about the method and measures

involved, in as much detail as they liked.

Question 6. Do you train instructors (e.g., teaching supervisors) in order to develop the type of teacher training program that you described in your answer to Question 3?

If so, describe the content and measures that are involved.

Participants who answered to Question 6 that they train instructors (e.g., teaching supervisors) were asked to provide additional information about the content and measures involved in such training (including the name of the training program, number of training sessions, training time, target trainees, and number of participants), in as much detail as they liked.

Question 7. Do you conduct teacher training in order to achieve classes that provide both independent and collaborative learning for children/students?

For this research, the answers to the follow-up questions for participants who answered yes to Questions 4, 5, and 6 are analyzed.

(3) Analysis method

The free-form answers to Questions 4, 5, and 6 will be analyzed through text mining, using TRUSTIA/R2 from JustSystems. Text mining is a generic term for text data analysis methods that divide unformatted text data into words to analyze their frequency of occurrence, correlation, and other characteristics, in order to obtain specific knowledge and ideas. By using text mining, it is possible to grasp trends in consciousness of survey participants which cannot be grasped with numerical data only (JustSystems, 2006, 2007; Yatsuka, 2009; Yatsuka & Higashihara, 2009). In this paper, the authors use text classification, one type of text mining, to analyze and discuss the data. Text classification is an analysis method that extracts and groups sentences with similar content, in order to grasp content that is of high interest to the survey participant (JustSystems, 2006, 2007). With this text classification, content with similar patterns of analytical data are grouped in the same cluster, the structure of the characteristics of the analytical data is extracted, and the form of each cluster is

displayed as a dendrogram as shown in Figure 1. Regarding the classification names that appear on the dendrogram, the most characteristic noun phrase is selected from the sentences of each classified cluster. In the dendrogram display tree, the closer that classifications are displayed together, the more relevant their content (the content of the document is similar); the farther that classifications are displayed apart, the less relevant their content.

The following analysis pretreatment was implemented in order to perform analysis with text mining. In order to reflect the participants' responses in the analysis as much as possible, if more than one specific type of content or measure was described for the same training program in the answer column, or if the same (or similar) specific content or measure was described for different training programs in the answer column, each was counted as 1 case. In addition, the format and notation of the text data used for analysis are not uniform, and misspellings also occur. When using text mining methods, such factors cause a drop in the accuracy of the analysis. Therefore, the format, notation, and typographical errors were corrected as much as possible.

Further, with the cooperation of personnel who were collaborating on this research, during the analysis, we arranged synonyms so that words with the same meaning were not treated as different phrases, in order to improve the reliability of the analysis. For example, the following phrases were treated as synonyms: in Question 4 "cross-session" as "group work", in Question 5 "Elearning" as "e-learning", "teacher training finished", "after teacher training", "training program complete", "after training program", and "after training course complete" as "after completion of teacher training", and in Question 6 "Management" as "management".

3. Results

(1) Content and measures for a teacher training program for providing both independent and collaborative learning opportunities to individual trainees and trainee groups

Figure 1 shows the results of performing text classification to analyze 297 pieces of text data

regarding the content and measures for a teacher training program for providing both independent and collaborative learning opportunities to individual trainees and trainee groups. The average number of words per document was 28, and the average number of characters per document was 44. The words were classified as noun phrases (42%), adjective phrases (2%), adverb phrases (1%), verb phrases (16%), and other (39%). It was determined that the following 10 clusters could be interpreted: [Group work], [Participants], [School], [Solution], [Practice], [Theory], [Training], [Teaching plan], [Research consultation], [Class]. In the dendrogram display tree below, the closer that classifications are displayed together, the more relevant their content. We will focus on these relationships and discuss their characteristics.

For [Group work] (key phrases: group work, poster sessions, posters, work, exchange of opinions), it can be inferred that group work is incorporated into the teacher training program, such as *“conducting group work based on reports that were brought”* (16 survey targets, training for persons with 10 years of experience (elementary and junior high schools), 2 times, 3 hours, approximately 500 participants)¹⁾.

When referring to text that was classified as [Participants] (key phrases: participant, participation, participants, dialog, mutual) it can be pointed out that measures are implemented to encourage dialog among participants, such as *“Improve consultations by using a teaching plan where participants select the subjects themselves and prepare lessons conducted by the participants.”* (30 survey targets, 5th-year training, 1 time, 5.5 hours, 55 participants).

[School] (key phrases: school, teaching, student, education, understanding) appears in many sentences and has low reliability. In such cases,

there is a possibility that it is a collection of minority opinions that cannot be grouped as chunks (JustSystems, 2007). For example, it is believed that a wide range of fields and areas have been set as training content, such as *“We have set up a wide range of training courses so that we can demonstrate our abilities in schools as middle leaders, such as for special education, student guidance, and management.”* (15 survey targets, training for persons with 10 years of experience, 4 times, 7 hours, 28 participants).

For [Solution] (key phrases: solution, task, problem-solving, self-task, self), a problem-solving teacher training program is introduced, such as *“For task training, set up educational tasks for each group (of 4 to 5 people), other than the subjects that are taught at school, investigate and analyze the issues, think about proposals for improvement, and make presentations.”* (48 survey targets, 1st-year training for high school teachers, 6 times, 100 minutes x 2 times; 2.5 hours x 1 time; 3 hours x 2 times; 230 minutes x 1 time, 24 participants).

For [Practice] (key phrases: practice, approach, practical presentation, reporting, sharing), there were descriptions such as *“Each participant brought a topic for class practice (guidance proposal, video recording of practice, etc.), introduced the practice, asked and answered questions, and conducted research consultation in line with the discussion parameters.”* (48 survey targets, training for persons with 5 years of experience in special education, 2 times, 2.5 hours, 24 participants). From this, we can see that practical content such as practice presentations and practice reports are included in teacher training programs.

When referring to text categorized as [Theory] (key phrases: theory, training content, affiliation, affiliated school, theory session), which is near

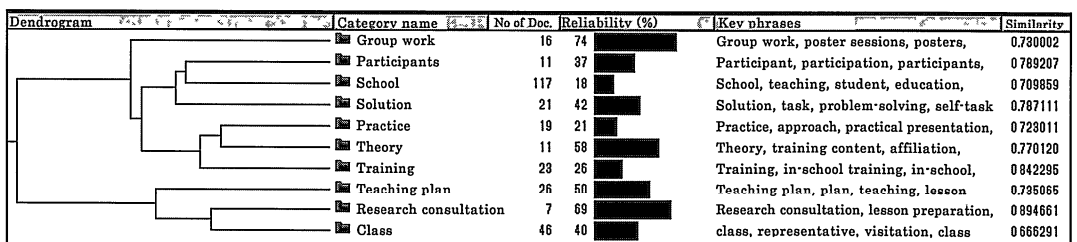


Figure 1 Content of and measures related to teacher training programs

[Practice], it is possible that emphasis is placed on the interaction between theory and practice, such as *“In the content for training, we build theory, practice, and verification as a unit, based on a theme, and go back and forth between theory and practice.”* (46 survey targets, 1st-year training, 19 times for elementary and junior high schools, 21 times for senior high schools and special education schools, 3 hours, 479 1st-year elementary school teachers, 306 1st-year junior high school teachers, 435 1st-year senior high school teachers, and 335 1st-year special education school teachers).

For [Training] (key phrases: training, in-school training, in-school, training program, recruitment), we can infer that an organization (flow) has been devised for training programs and training courses, such as *“Every time, before training starts, we suggest a ‘goal’ and a ‘flow’ for training. In addition, at the end of the training, we take time to ‘review’, provide time to think about how each participant learned during training and how that can be applied and put into practice at our school.”* (50 survey targets, training to cultivate class research staff, 5 times, 5 hours, 185 total participants).

For [Teaching plan] (key phrases: teaching plan, plan, teaching, lesson teaching plan, lesson teaching), the content of the training related to lesson preparation (lesson teaching) are grouped individually and not in the [school] category, such as *“Teaching plans and teaching materials are brought and examined by teachers who selected the same subject in simulated classes, in order to prepare better lessons.”* (32 survey targets, training for 1st-year junior high school teachers, 2 times (including 1 simulated class), 45 participants).

[Research consultation] (key phrases: research consultation, lesson preparation, relation, time, research) is located near [Teaching plan] above, the same as [Class] discussed below, and therefore it is believed that there is a high degree of relevance among the content. Specific descriptions include *“We provide time for lesson preparation and research consultation.”* (40 survey targets, training for 1st-year teachers, 9 times, 2 hours, 506 participants). For these reasons, a study consultation style is adopted for education and training programs related to lesson preparation.

[Class] (key phrases: class, representative, visitation, class research session, research session) has a high degree of relevancy with the content of the [Research consultation] and [Teaching plan] categories. When referring to the text in this category, descriptions such as *“Classes are practiced based on a teaching plan, and in-school class research sessions are held for self-improvement of classroom skills.”* can be seen. It appears that this style of class research session is also adopted. (30 survey targets, 5th-year training, 1 time, 1-hour class and class research workshop, 55 participants).

(2) Methods and measures for verifying the results of teacher training programs for providing both independent and collaborative learning opportunities to individual trainees and trainee groups

Figure 2 shows the results of performing text classification to analyze 106 pieces of text data regarding the methods and measures for verifying the results of teacher training programs for providing both independent and collaborative learning opportunities to individual trainees and trainee groups. The average number of words per document was 25, and the average number of characters per document was 39. The words were classified as noun phrases (42%), adjective phrases (0%), adverb phrases (1%), verb phrases (13%), and other (44%). It was determined that the following 6 clusters could be interpreted: [Visit], [Training], [Teacher], [Measures and improvements], [Participation], [After completion of teacher training]. The characteristics of each are described below.

For [Visit] (key phrases: visit, interview, teaching supervisor, class, class observation), it is understood that the target is collecting information on the persons to be trained, and following up after the training, such as *“After training, we actually visit schools to observe classes and conduct interviews and surveys.”* (12 survey targets)

For [Training] (key phrases: training, implementation, questionnaire, center, next year), it is believed the evaluation results are provided as feedback for the teacher training programs conducted the following fiscal year, such as *“After the completed questionnaires are collected, we will send them to instructors and teaching supervisors*

of related subjects, and they will be used as a reference for future training.” (23 survey targets)

For the category [Teacher] (key phrases: teacher, 1st-year teacher, verification, 1st-year, result), which is located near [Training], descriptions such as “All teachers in the city fill out self-assessment sheets for the improvement of classes, and we check for correlations between the summation results and the content of training.” are seen. (19 survey targets) From this, it can be inferred that the survey target is trying to verify effectiveness by verifying the relationship between training content and training evaluations.

For [Measures and improvements] (key phrases: measures and improvements, indicators, city-specific, training program, program), although the number of cases was small, there were descriptions such as “Indicators are set independently by the city, and utilized for measures and improvements to training programs.” It is possible that indicators are prepared beforehand and are utilized to improve teacher training programs. (19 survey targets)

For [Participation] (key phrases: participation, participants, content, evaluation, training content), descriptions such as “A questionnaire survey is conducted after each course is completed, to confirm the level of satisfaction regarding the content of the course.” were observed. (26 survey targets) It is believed that training evaluations are primarily based on evaluations made by participants.

For [After completion of teacher training] (key phrases: after completion of teacher training, completion, questionnaire, implementation, training), it can be pointed out that questionnaire surveys are conducted after the teacher training is complete, to verify the effect of the training, such as “After every training program, we conduct a questionnaire survey for the participants and the principal.” (5 survey targets)

(3) Content and measures for training instructors (e.g., teaching supervisors) for teacher training

Figure 3 shows the results of performing text classification to analyze 67 pieces of text data regarding the content and measures for training (program) for instructors (e.g., teaching supervisors) for teacher training. The average number of words per document was 29, and the average number of characters per document was 47. The words were classified as noun phrases (45%), adjective phrases (1%), adverb phrases (0%), verb phrases (13%), and other (41%). It was determined that the following 9 clusters could be interpreted: [Class], [Cultivate], [University], [Education], [Management], [Society], [Training], [Work], [Teaching skills]. The characteristics of each are described below.

For [Class] (key phrases: class, in-school research, research, class practice, practice), it can be pointed out that teaching practice is adopted as part of the content of the training for instructors who will lead teacher training, such as “Lecture on the role of

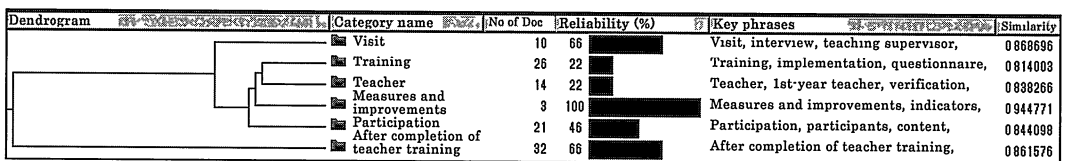


Figure 2 Methods and measures for verifying the results of teacher training programs

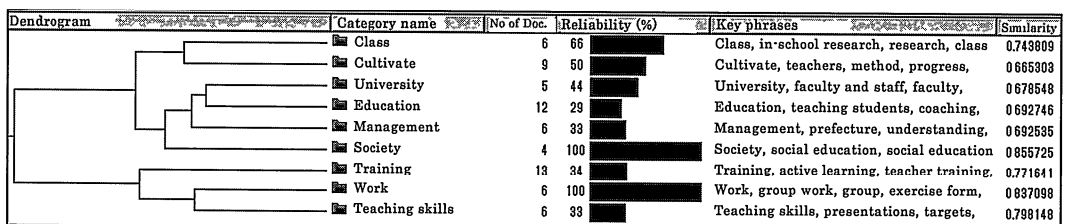


Figure 3 Content and measures for training instructors (e.g., Teaching supervisors) for teacher training

in-school research staff and exchange between schools. Practice reports for schools where in-school research is progressing. Exchange of class practice that is conducted at each school." (46 survey targets, training for in-school research staff, 3 times, 3 hours, 200 teachers from elementary and junior high schools (including early and middle-grade levels at special education schools)

For [Cultivate] (key phrases: cultivate, teachers, method, progress, time), it is understood that emphasis is placed on the theories regarding the development of human resources. Specifically, there are descriptions such as *"Once a week we discuss methods of developing human resources, group training, and the content and method of on-the-job training."* (39 survey targets, teaching supervisors meeting in the teacher development section, once weekly, about 1 hour, 15 participants)

For [University] (key phrases: university, faculty and staff, faculty, professors, field staff), it is possible that collaboration and cooperation with universities (university faculty members) is being strengthened, such as *"When possible, we also have university teachers participate, and we listen to their advice."* (10 survey targets, research subcommittee by teaching supervisors in the center, about 10 times each year, about 2 hours, 14 participants)

For [Education] (key phrases: education, teaching students, coaching, knowledge, teaching), as with the content of the [School] category for teacher training programs for providing both independent and collaborative learning opportunities to individual trainees and trainee groups as described above, it can be pointed out that a wide range of training content has been set up, such as *"Training is conducted regarding how to teach students, how to teach lessons, and other educational issues that the participants are facing, in order to deepen their insight and aim for a common understanding."* (23 survey targets, regular training for the teaching department, 6 times per year, 2 hours each time, 50 participants)

For [Management] (key phrases: management, prefecture, understanding, survey, organization), it can be inferred that content related to management is incorporated into the content for training, based

on descriptions such as *"Lectures and exercises to encourage understanding of the way the school organization is managed."* (49 survey targets, training for teaching supervisors, 6 times, 3 hours, 220 participants)

For [Society] (key phrases: society, social education, social education supervisors, skills, health), it can be inferred that content related to not only teaching supervisors, but also to social education supervisors is included, such as *"We will deepen our insight into specialized matters related to school education and social education, and improve the qualifications and skills of teaching supervisors and social education supervisors."* (45 survey targets, training for teaching supervisors and social education supervisors, 2 times, 3 hours, 172 participants)

For [Training] (key phrases: training, active learning, teacher training, evaluation, etc.), it can be pointed out that methods of the active learning type of teacher training are being considered, such as *"Training programs that have incorporated the active learning type of training were suggested for in-service training institute teaching supervisors and training instructors by the staff in charge of training, and a common understanding was reached regarding the active learning type of training in the training research institute."* (6 survey targets, 8th in-service training institute teaching supervisors meeting, 1 time, 20 minutes, 20 participants)

For [Work] (key phrases: work, group work, group, exercise form, etc.), it is believed that the content necessary for planning and managing workshop training for target teaching supervisors has been implemented in an exercise form that incorporates group work, such as *"The content necessary for planning and managing workshop training for teaching supervisors was implemented in a practice format that incorporates group work."* (21 survey targets, team training, 20 times, 0.5 hours, 14 participants)

[Teaching skills] (key phrases: teaching skills, presentations, targets, supervisors, teaching supervisors) has a high degree of relevancy with the content of [Work], as discussed above. Referring to the description, it is possible that training content that is aimed at improving the teaching skills of

teachers for training has been incorporated, such as *“Lectures and exercises that contribute to improving the teaching skills of teaching supervisors, in order to cultivate the qualities and abilities of students.”* (49 survey targets, training for teaching supervisors, 6 times, 3 hours, 220 participants)

4. Discussion

(1) Content and measures for a teacher training program for providing both independent and collaborative learning opportunities to individual trainees and trainee groups

It was clear that the boards of education and other organizations that organized training had implemented a variety of measures to provide both independent and collaborative learning opportunities to trainees.

For example, since trainees tend to be passive during training that focuses mainly on listening to presentations by instructors and teaching supervisors, it seems that the survey targets often incorporate group work formats. Further, rather than simply setting up a “place of collaboration” for a group work format, they used a variety of measures to promote independence and collaboration, such as letting the trainees bring their teaching plans and practice records to use as consultation material in order to make presentations of the groups’ ideas, and incorporating activities for coming up with plans to make improvements to problem areas. For 1st-year training and training for teachers with 5 years of experience, in particular, we believe that they aimed to solve common problems through independence and collaboration by adopting a group work format because the trainees have a shared awareness of the tasks at hand.

(2) Methods and measures for verifying the results of teacher training programs for providing both independent and collaborative learning opportunities to individual trainees and trainee groups

It was clear that the boards of education and other organizations that organized training collected data by conducting questionnaire surveys and

interviews mainly for trainees, in order to verify the effect of teacher training programs for providing both independent and collaborative learning opportunities to trainees. Regarding the collected data, there were cases where such data was shared with the organizer as feedback for training to be conducted the following year and used to verify correlation with the content of the training. Therefore, it can be inferred that such data is being used to improve the content of training.

However, this is not a response to requests for improvements by trainees. In other words, it does not provide both independent and collaborative learning opportunities to individual trainees and trainee groups. In addition, it is necessary to consider the validity of the evaluation indicators that are determined independently by the organizer. Although evaluation indicators are prepared according to the content of the training, the assignment of evaluation indicators for teachers to understand their competence is an issue.

(3) Content and measures for training instructors (e.g., teaching supervisors) for teacher training

Regarding instructors (e.g., teaching supervisors) for teacher training, it was clear that the survey targets were conducting training that incorporates practice reports and the exchange of class practice, an invitation of university professors, and the implementation of group work, for both theory and practice across a wide range of fields. This is because training instructors (e.g., teaching supervisors) are expected to conduct training that includes a wide variety of content, such as class improvement, how to teach students, and management methods, using a wide variety of methods and for a wide variety of teachers, such as 1st-year teachers, mid-level teachers, supervisors, and management level faculty. Therefore, it is inferred that training is required to improve the required planning, managing, and teaching skills.

It is believed that surveys to verify the effectiveness of such training for instructors (e.g., teaching supervisors) of teacher training, and surveys of the qualifications and skills that are required for such instructors (e.g., teaching supervisors) and evaluation indicators for such

qualifications and skills will be required in the future.

5. Summary

In this research, as a result of using text mining to analyze the responses to a questionnaire survey targeting boards of education and other organizations, the actual situations regarding “content and measures for a teacher training program for providing both independent and collaborative learning opportunities to individual trainees and trainee groups”, “methods and measures for verifying the results of teacher training programs for providing both independent and collaborative learning opportunities to individual trainees and trainee groups”, and “content and measures for training instructors (e.g., teaching supervisors) for teacher training” were made clear.

It is believed that these results indicate that boards of education and other organizations are taking into consideration the “shift toward teacher training that includes independent and collaborative learning elements” and the “necessity of cooperation between universities and boards of education” for training as pointed out in the report released by the Central Council for Education in 2015, and the “necessity of training evaluations” as pointed out in the “Teacher Training Guidelines” released by the National Center for Teachers’ Development in 2016 (currently the “Faculty Training Guidelines” from the National Institute for School Teachers and Staff Development).

It is believed that further consideration of the details regarding the verification of the effectiveness of training, such as evaluation indicators, will be required in the future.

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Notes

- 1) Descriptions enclosed in quotation marks (“”) are direct quotes from actual descriptions provided by a target of the survey. Information enclosed in parentheses () includes the number of survey targets, the name of the training program, the number of times training was held, the duration (time) the training was held, and the number of participants, in that order. (Only the number of survey targets is indicated for Question 5.)

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