

Study on Fostering of “Teaching Skills for ICT Use” on a University Teacher Training
Courses
Report Summary

1. Purpose and summary of the study

1.1 Purpose of the study (Chapter 1)

This study comprehensively examines the practice of fostering the teaching skills for ICT use required of teachers who are responsible for teaching children living in the 21st century, and aims to obtain findings, which will contribute to improving various issues such as the need to organize a curriculum to foster the teaching skills for ICT use that students need to acquire in the teacher training courses or teaching certificate acquisition courses.

1.2 Background of the study (Chapter 2)

Based on the recommendations of the Report of the Central Council for Education entitled “Improving the Quality and Ability of Teachers in Charge of Future School Education - Towards the Creation of a Teaching Community that Learns and Improves Together” (December 21, 2015) that suggested that it was necessary to secure a national level of teacher training through the stakeholders jointly developing guidelines (core curriculum for teacher training) to be used as reference when organizing the curriculum, the core curriculum for teacher training was published on November 17, 2017, and, on the same day, a circular notice was issued for the promulgation of a ministerial order to amend part of the Ordinance for Enforcement of Teaching Licenses and the Rules for License Renewal Training, and the amended Ordinance for Enforcement of Teaching Licenses will be enforced from April 1, 2019. The aim of these is to secure quality assurance at a national level in teacher training corresponding to the new challenges of education in the university teacher-training courses.

One new challenge in education is teaching methods which use ICT. Teaching methods that use ICT refer not only to the teachers themselves learning how to operate the ICT equipment, but also to fostering a foundation for competence enabling the teaching of effective classes using ICT and developing and utilizing appropriate digital teaching materials and skills to foster the ability of children to use information.

1.3 Methods Used in the Study

1.3.1 Questionnaire

1.3.1.1 Questionnaire for Universities and Other Educational Institutions Conducting Teacher Training (Chapter 3)

A questionnaire was sent by post from November 21 to December 9, 2016 to the universities, junior colleges, and junior college departments (850 institutions) that conduct teacher training across the country.

The questionnaire was composed of (1) a survey on facilities and equipment inquiring about the facilities and equipment that are available for use in the subjects relating to teacher training, and the status of implementation of the various training sessions targeting the university teachers who give lectures on the teaching profession (one copy per institution), and (2) a survey on lectures asking teachers of subjects relating to teaching pertaining to the fostering of teaching skills for ICT use ((i) teaching methods for each subject, (ii) educational methods and techniques (including use of information equipment and teaching materials), and (iii) operation of computer equipment) (one to three copies per institution). The questionnaire items were designed taking into account the revision of the criteria based on the “Criteria for the ICT Teaching Skills of Teachers” for school teachers.

1.3.1.2 Questionnaire for the Board of Educations and Education Centers (Chapter 4)

The contents of the questionnaire inquired about the number of staff, the available ICT equipment, the network environment, staff responsible for network maintenance among the schools (prefectures only), intended ICT skills to be acquired, the status of implementation of training, course content, and the status of implementation of training for education center staff. The questionnaire targeted all of the local governments throughout the country and was sent by post between February and March 2017 to the education centers for the prefectures and designated cities, and to the boards of education for the municipalities, but if an education center had been established in the municipality, a request was made for the questionnaire to be passed on to it.

1.3.2 Interview study

- (1) In terms of interviewing the universities, with the cooperation of the education faculty of a national university, we were able to interview 11 teachers in charge of the teaching methods for eight subjects over two days in December 2017 (Chapter 3).
- (2) In terms of interviewing the local governments, we visited and interviewed the boards of education and education centers in Okayama prefecture where the ICT standards were high (Chapter 4).
- (3) In terms of advanced cases abroad, we conducted an interview study vising universities

and other educational institutions in six countries: the US, China (Shanghai), Estonia, Singapore, Australia and Denmark (Chapter 5).

2. Summary of the study results

Here, a summary is given of the research outcomes of Chapters 3 to 5 of the Report.

2.1 Chapter 3 Fostering Teaching Skills for ICT Use in the Teacher Training Courses, etc.

2.1.1 Results and Analysis of the University Survey (Questionnaire Survey)

(1) Survey on facilities and equipment

(i) ICT equipment available to teachers in charge of lectures in the teaching certificate acquisition courses.

It became apparent that there has been little progress in the development of electronic blackboards (average of 3.41 units) and digital textbooks geared towards teachers (average of 1.23 licenses). When compared with projectors (average of 42.44 units) and overhead projectors (average of 23.01 units), it is hard to honestly say that an environment has been prepared where learning can take place using electronic blackboards and digital textbooks.

(ii) Network environment available for lectures in teaching certificate acquisition courses

The classrooms where a wireless LAN was available for use were more advanced at the national universities than in the public and private universities (about 55% on average in the public and private universities, and about 85% on average in the national universities). This result was based on the fact that access was possible in almost every area of the classroom, but did not require that all students in the classroom were able to simultaneously connect at an ample speed.

The status of implementation of lectures using private devices is higher in the national universities than in the public and private universities (around 40% on average in the public and private universities, around 64% on average in the national universities). The use of private devices (BYOD) is one effective solution to realizing an environment of one unit per person, but in order to do so, preparations need to be made such as ensuring a secure campus network and maintaining a wireless LAN.

(iii) Implementation of training for university teachers

The implementation rate of ICT use training based on the perspective of active learning, and training relating to information security and information morals etc. was

good in the larger universities which had a large number of students. What is needed though is to devise ways to increase the implementation rate in small and medium-sized universities.

(2) Survey on lectures

(i) Extent of ICT use in lectures

Although ICT is used to “present materials”, its use in “sharing students’ ideas” and in “cooperative learning such as group work” is infrequent. Moreover, its use “to embed knowledge” tends to be low depending on the type of lecture.

(ii) Instruction on teaching techniques using ICT in order to conduct research on teaching materials and to prepare and evaluate teaching

While the level of use for the fostering of skills to be acquired by the students throughout all of the teacher-training subjects, which are “understanding of the effects and benefits of education”, “collecting materials” and “preparing materials” was relatively high, the level of ICT use in “planning lessons that utilize ICT”, “using ICT in the teaching materials”, “coordinating with the parents”, “ascertaining the learning situation” and “improving the methods of use” was not that high. In particular, ICT use in the teaching methods for subjects other than engineering and information was not high, and measures need to be taken.

(iii) Teaching of educational techniques using ICT for when students teach their own classes

The likelihood of whether a student on becoming a teacher is able to teach a class with a deliberate awareness of the use of ICT generally indicated a low value. First, the university teachers themselves need to practice ICT use in their own lectures, and a curriculum needs to be considered so that the students who have taken the lectures are able to practice ICT when they themselves become teachers.

(iv) Teaching of information application skills

These are overall skills that are basically independent of the subject. It would be beneficial if they could be taught throughout the entire teaching certificate acquisition course, and for the most part, this is the case. On the other hand, for the question, “Will the students be able to teach the children the contents they themselves have learned by taking this lecture?”, since “informing and explaining in an easy-to-understand and effective manner” was deemed inadequate, it would be better to have the students

acquire teaching skills relating to “presentation and explanation” in lectures that have to be attended by all of the students.

(v) Teaching the knowledge and attitude that is the basis for information use

These are overall skills that are basically independent of the subject. It would be beneficial if they could be taught throughout the entire teaching certificate acquisition course, and although the numerical value is slightly low when compared to the teaching of information application skills, it is high for both items. On the other hand, for the question, “Will the students be able to teach the pupils the contents they themselves have learned by taking this lecture?”, as in the case of the teaching of information application skills, it is important that this point is taught in lectures that have to be attended by all of the students.

2.1.2 Teacher-Training Related Courses from the Perspective of Fostering Teaching Skills for ICT Use

Since teaching skills for ICT use are skills which are required not just in teaching individual subjects (teaching which uses ICT in the lessons), but in all educational activities across the board, thought needs to be given to fostering teaching skills for ICT use throughout the entire teacher-training course. Therefore, we introduced examples for fostering teaching skills for ICT use in line with the teacher-training curriculum.

2.1.3 Examples of Fostering Teaching Skills for ICT Use in Teacher-Training Courses (Interview Survey)

- General classes on the subjects are attended by a large number of students (about 100), and the classes are taught through a combination of lectures and practical exercises (such as mock lessons). PowerPoint is used in the lectures, and PowerPoint presentations are also used in the presentations by the students, but computers and PowerPoint are not themselves taught in class.
- Teaching skills of ICT use are handled as “information processing” in the first and second year, and no topic-specific lectures are given using up special time in class. Comments are made as appropriate on teaching methods in the discussions on the teacher’s own teaching methods and on student presentations.
- In terms of approving curriculum reorganization and efforts relating to the core curriculum, reorganization of the lectures is planned in every subject, but new components do not necessarily have to be introduced, and the general thinking is that it

is sufficient to simply reorganize the existing lesson content. The biggest challenge in all of the subjects is how to teach the large number of students who are required to take the introductory lessons which are compulsory components.

- In terms of the ICT environment of the university, it is best to ensure an environment where the students are able to practice mock lessons so that they do not find themselves unprepared when they go to the teaching practicum such as preparing a Wi-Fi environment throughout the campus including the gymnasium and grounds, introducing tablets for the students, maintaining an environment where electronic blackboards can be used, and purchasing digital textbooks.

2.1.4 Deliberate consciousness of university students towards ICT use

The survey results on the deliberate consciousness of students towards ICT use in the field of education for 161 undergraduates affiliated with an elementary school teacher training course of a national university showed that a record of attending classes which include ways to use ICT was linked to a sense of the effectiveness of ICT use, and therefore, it is considered necessary to provide students with ample opportunities to acquire more practical experience through classes and the teaching practicum in order to have the students acquire the teaching skills to teach children the ability to learn through the use of ICT.

2.2 Chapter 4 Fostering the Teaching Skills of ICT Use of In-service Teachers

2.2.1 Results and Analysis of the Survey for the Boards of Education and Educations Center

(1) Education Center Questionnaire (Questionnaire Survey)

Responses showing a high response rate from local governments with a high level of ICT teaching skills acquired through training on informatization of education.

- The devices that are used are “projectors” “tablet-type computers” “digital textbooks for teachers” and “training rooms”.
- The status of implementation of training is “training for persons in charge of promotion of informatization” “implementation of informatization training in management training” and “implementation of informatization training in annual training”.
- The target teachers or children at the time of formulating the training course were “teachers who use ICT equipment to collect data”, “teachers who effectively use the digital textbooks geared towards teachers”, “children who use ICT equipment to share their opinions with each another”, “children who use ICT equipment to compile their

ideas together in a group”, “teachers and children who correctly understand and respect copyright etc.” and “teachers and children who avoid dangers on the Internet and use the Internet appropriately”.

- The contents of the training include “measures of the national government and prefectural governments”, “crisis management”, “practical case reports”, “information security, information morals, copyright”, “school business using ICT equipment and groupware”, “programming education” and “preparation of teaching materials and lessons utilizing ICT equipment”.

(2) Case studies of Okayama prefecture (interview study)

In FY2009, target goals were set for the teachers’ teaching skills for ICT use, and training was implemented to achieve these goals. As a result, the prefectural ranking of the teachers’ teaching skills for ICT use rose significantly, and since 2013, these skills have ranked first or second in all five items from A to E. This shows the positive effect of the mock training held in school using an overhead projector, which was held for all teachers in charge of information education under the prefectural government for six years from 2009.

2.2.2 Case studies on the fostering of teaching skills for ICT use by the boards of education, etc.

One example is the structure and flow of leadership training relating to the informatization of education of Kumamoto Board of Education and Kumamoto Prefectural Education Center, and the introduction of a training module. From the results of the Survey on Awareness Relating to Teaching Skills for ICT Use, it is surmised that it has been possible to promote information use at the schools such as with the increased awareness of effective data presentation by the teachers. The second case introduced a summary of the efforts of Saga Prefecture and the “Saga ICT Use Education Festa” and the expansion of teacher training such as novice teacher training through an introduction of the examples of the Saga Board of Education.

2.3 Chapter 5 Fostering of Teaching Skills for ICT Use Outside of Japan

In Australia (Victoria) and Denmark, we visited the classes of a university (undergraduate) teacher training course. The teaching method combined lectures and practical exercises where students were able to experience how the ICT which was being practiced could be used in actual classes, and this method is considered to be one example

for future reference for possible practice in Japan. However, in both countries, the costs of preparation of the teachers were large, and the key is to reduce the preparation costs. In Singapore, a method was employed where the lessons were taught through ICT technology experts as well as support personnel incorporating the ICT into the curriculum working together with the teachers as a team to teach the university classes. If this kind of system can be realized, it is likely to reduce the burden on university teachers.

In the interview survey, some examples were collected as reference in terms of promoting the use of ICT in educational fields other than the area of teacher-training which was the focus of this project. One of them was an example of a high school in the United States, where the principal visits classes every week and endeavors to share best practices with the teachers. This is a method that can be realized by taking action for ICT use in a way where it can be done without incurring huge costs.

Judging from the international surveys, it seems difficult for any country to catch up with ICT, which is evolving on a daily basis, and to take it into the classroom, and for the most part, ICT use appears to be based on trial and error. A common point for all of the countries was that even if the use of specific tools is taught, these tools soon become obsolete. Therefore, it is important to prepare measures or a support environment where teachers will be able to learn how to use the tools and services that they need in their teaching when required. In other words, this entails creating an environment where teachers are able to teach one another, preparing online training, and assigning technical support personnel. In addition, with regard to methods of ICT use, the teacher needs to adopt a stance of learning together with the children. In this respect, the examples from Australia are useful.