A Case Study on ICT Education Abroad

International Committee, Japanese Association of University Women (JAUW)

I. Preface – ICT at our hand

Today, as computers and the Internet have become so handy for us to use、we appreciate their benefit and convenience in our daily life. In fact, electronic communication is now prevalent in our society, bringing tremendous positive contributions. Would this benefit, however, be available to all of us living in this world? With this question in our mind, we have decided to make a research on educational surroundings of ICT especially at school in various countries.

First, as we had information for Japanese primary schools that educational programs on the computer are available in general curriculum, we accessed to a homepage of the Ministry of Education and Science to know to what extent those programs are practiced at schools. Although it was realized that in many schools in various regions lessons for exchanging e-mails and setting up homepages are exercised in numerous ways, it was hard for us to read from the Ministry's site whether any guideline or syllabus is made available for elementary school. Consequently, in order to keep our research going, we have decided to start getting information from the overseas on what it has been actually taught at schools for the subject of ICT (see the Table I-2) in the foreign countries.

Secondly, we are also minded to make a research if homogeneity and universality of educational programs for ICT have been assured at schools in the overseas (see Table I-3). In addition to them, we decided to survey over the issue of gender equity in the field of ICT education (see Table I-4). While studying some documents, we realized that in the United States in l996, President Clinton tried to set up the policy of Super Highway Communication System at every school within the States, and that in Korea, in response to President Kim Dae-jung's call, it was decided that educations on ICT and English Language should be initiated at every primary school throughout the country, and that the reason for these decisions did come from the concerns that digital divide should not be brought into their countries. We therefore decided to ask for the relevance between educational programs carried by schools and their concerns toward digital divide (see Table I-5). Finally, we questioned about the prospect and concerns by the school toward ICT education (see Table I-6).

From the aspect of these five viewpoints, we made it our purpose to make a research on the present situation of ICT education at schools, and we prepared questionnaire to meet this purpose.

Contents of the Questionnaire: [Table I]

1. Identification of the schools asked for answering questionnaire:
   (1) Persons responsible to answering the questionnaire
   (2) Name and location of schools (public or private; urban, suburban, or country-side)
   (3) Number of pupils enrolled (male/female)
   (4) Required period of attending school and grade of years starting ICT education
   (5) Conditions of infrastructure of ICT education (basic installment including computers)
   (6) The purpose for using computers
   (7) Teachers involved in ICT education
   (8) Availability of a long distance educational system; a system of Computer Assisted Instruction, etc.
2. Toward ICT Education
   (1) What is taught in the first year of ICT education
   (2) What has been taught up to the last grade
   (3) Subjects offered and allowed to study
   (4) Syllabus
   (5) Principles for ICT education

3. About the National Policy for ICT Education in your country
   (1) Any national policy or guideline available for ICT education
   (2) Any National back up for ICT education
   (3) Relevance between national policy and ICT education given at school
   (4) Allocation of national budget
   (5) Year for starting ICT education
   (6) Opportunity for initiating ICT education

4. Gender Gap Issues
   (1) Hours of lesson for giving ICT education
   (2) & (3) Gender proportion
   Difference of attitude toward ICT education between girls and boys

5. Solution to the problem of digital divide
   (1) Availability of computers at home
   (2) Concerns for digital divide
   (3) Validity of ICT education at school

6. Expectation and concerns toward ICT education
   (1) Expectation
   (2) Concerns

II. Method of Research

The committee members asked their friends and acquaintances through e-mail for a help to answer questionnaire for research. In addition to this, while they appealed to voluntary helps from the overseas through the links to the IFUW homepage, they received a response from 17 countries and over 60 schools. From Korea and Thailand, thanks to the help of national presidents and CIR of each association of University Women, 19 schools responded to the questionnaire. We are very grateful to their collaboration (see Fig. 1.)

[Fig. 1: Countries where people cooperated in answering the questionnaire]

In handling the data for the statistics, the committee classified the cases by the nature of questions between a case where all 60 schools responding separately were counted by individual unit, and another case where the answers from the same nation were grouped into one as a national unit, so that an imbalance of figures of the answer caused by nation could be better and more fairly handled.

However, data was not necessarily available from all schools, since as in the case of Kenya and some cases of the Philippines, we obtained an answer that there was no computer available in school, or, if any, not enough to let pupils use it. In fact, there lies a question of digital divide.

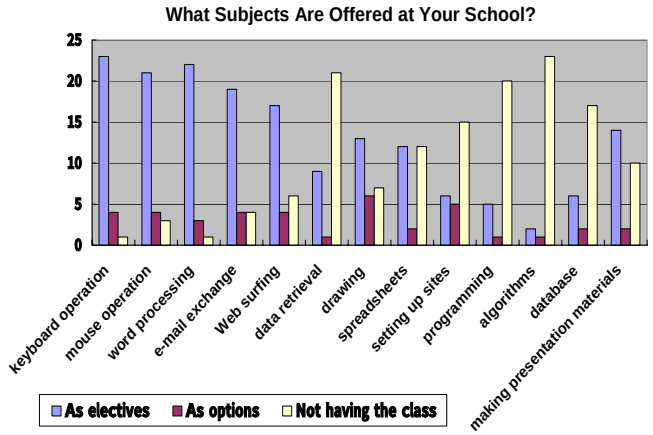
III. Analysis and Perspective

What has been offered at schools?

As for installment of hardware, according to our research, the educational institution that possessed the largest number of computers at school was a learning center in the United States where 3000 pupils were enrolled and 395 computers were available. Next to this figure, the largest number of computers installed at school was a high school again in the United States where 300 computers were available for 3500 students. Following these examples were two schools in Korea, where 240 computers were equipped for the capacity of 700 students and 950 students respectively. Ninety-five per cent of the schools those responded to our questionnaire were using computers for the purpose of practicing and learning by students. As for the fulfillment of equipment, the American School at the Yokota US Military Base in Tokyo where two pupils can work at one computer was a superceding case. On the contrary, a school in Mongolia where 3200 pupils are enrolled sent comments to the questionnaire: “In our school, we have only 15 computers and these computers are not connected to the Internet. Pupils, both girls and boys, are eager to learn and work at computers, but a chance to use computers is hardly left for them.”

Now, in Japan, how many teachers specialized in the field of computer skills are engaged in teaching the subject at each school? According to the research we made, three-fourth of schools overseas have one or more teachers specialized in ICT education. From our suspicion that there could not be too many specialized teachers available at school throughout the world, we launched the next question leading to ask how often the occasions for training teachers for ICT have been provided. The answer was that three-fourth of schools provide such occasions. In Thailand, one of the answers was that “the nation makes it their policy to keep all teachers knowledgeable for ICT.” However, another school in the same country points out: “Schools lack of the staff for teaching and programming ICT.” Apparently, It seemed that there could be a gap between the national policy and its implementation. Consequently, we had a feeling that if there could be any full-time staff specialized in ICT education available at each school, it would make a big difference to teachers who are trying hard to accomplish ICT skills.

The following figure shows if, or if not, computer skill training, item by item, has been carried in curriculum, either compulsorily or selectively, at schools on all levels of primary, middle high, and senior high school (see Fig. 2.) As for primary schools, on average, they teach in the first year of computer training how to handle key-board, to use mouse, and to draw pictures, and through the whole course of primary school they teach how to input sentences and to exchange mails. In Korea, characteristically drawing pictures is scarcely taught while wave surfing (accessing to homepages one after another on the Internet) is taught at more than half of the schools.



[Fig. 2: What Subjects Are Offered at Your School?]

As for middle and senior high schools, most of the schools teach how to use key board and mouse, to input sentences, to exchange mails, to wave surfing, to draw pictures, to tabulate calculation, and to draft materials for presentation. Furthermore, in more than half of the schools, they teach how to set up a homepage. On the other hand, they rarely teach skills of searching for data, programming, algorism and maintaining data at high schools. Such tendencies can be reasoned in the way that techniques of setting up homepages should not necessarily access to the Internet; and likewise that wave surfing could be demonstrated by teachers so that students could have a quasi-experience without actually accessing to the Internet. In contrast to these skills, searching data would definitely require students and pupils to keep the net environment always available for them.

Maintenance of hardware is not always an easy task for schools to carry, and that the net environment should be frequently checked and censored by schools for educational purposes would cause tremendous burden on them. While bilateral direction of communication is the key word of the Internet, difficulties of teaching the method of data searching have prevented ICT education from being truly appreciated by learners at school. Consequently, in addition to the physical and financial difficulties of installing computers at school, most of the schools have tended negative and cautious toward ICT education, mainly in fear of harmful information as well as virus problems brought over to their Internet environment.

As for the hours of learning ICT, a majority of primary schools have a class only once a week or less than that. At high schools, setting hours is varied from school to school. Some have only 36 hours a year, while others spare more than 161 hours for ICT education. Among those offering many hours of classes for ICT are science course schools, and it is understandable that they provide a variety of selective classes for the study of science-technology including ICT. However, it is too obvious that how many hours of ICT classes are offered in the course of studies would reflect a reality whether or not the schools are devoted to ICT education.

One of the schools in India sparing some 180 hours a year for ICT programmes defined the ICT education as the learning “all about the computers.” India has been known as the country bringing so many brilliant engineers of the computer. A school in the Philippines offering 200 hours of ICT education expresses their hope that “we can even implant technical abilities among the students who have only finished middle high school.”

National Policy for ICT Education

The year when each school started ICT education varied; the earliest school started in 1988 and the latest in 2003. Needless to say, the year does not mean nationwide initiation of ICT education in respective countries. We did find, however, that counties Costa Rica, France and Korea now provide nearly homogeneous education across the nation. Because they answered that their governments set out a guideline and earmark budget to carry out the same ICT courses nationwide. Providing adequate budget is essential to implementation of any policy. The junior high school in Yokota US military base near Tokyo is supported through the US Defense Department. On the other hand, however, regular public schools in the USA are taken care of by their school districts; with exceptions of Internet cables co-funded by the federal government in less affluent neighborhoods. As you can see in the American case, we must conclude that homogeneity and universality of ICT education is not guaranteed in most of the surveyed countries.

Gender Gap Issues

As to the gender proportion of students in ICT courses, the schools responded either they see no difference or that boys are proportionally higher. No school suggested higher girls’ proportion other than those in which girls outnumber boys. Then we asked about gender difference in attitude. Many school answered they see no difference, including even those in which class enrollment showed a great disparity between two genders. For example, schools in China, the Philippines, and India, whose gender proportion they say stands at 7 to 3, responded they see no difference. Similarly those schools in Thailand, Korea, and Germany, in which the gender proportion is 6 to 4 say ‘no’ to the question above. It may be true that the individual students enrolled in ICT courses do not show any

gender difference but we think we need to consider the rest; the students as a whole. Are such students in sight who do not or will not learn, supposedly with many girls among them? We must point out that gender differences come from many factors that we are not aware of.

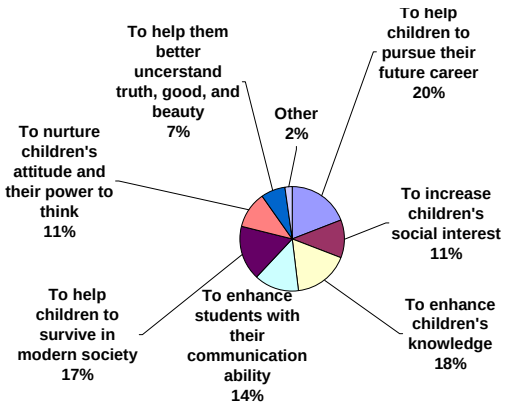
Here are some of the remarks by the respondents: “Girls do not find ICT more difficult and neither their families exert influence upon them (India).” “Boys are more interested in computers (China, the Philippines, Thailand).” “Boys want to get on to play games. Girls like arts programs/ reading and drawing (Canada).” These remarks nonetheless indicate that motivation and instruction are important. At the same time, they make us argue if boys and girls are different in terms of interest and, accordingly, if the materials provided in classroom are truly adequate for both.

In the course of this research, we learned about a teacher in a Japanese elementary school who instructed the boys to use a unit of computer for oneself while ordering the girls to share one unit between two. In this deplorable case, the teacher is to blame for not motivating students fairly but even worse, for creating gender bias. We found another interesting anecdote in a magazine article. A leading computer maker in Japan is engaged in a volunteer activity to teach computers to junior high school students. Since their goal is to have an equal number of female engineers as male counterparts in the long run, they invite only girls to their institute during school vacation and women engineers are there to teach them. They also serve as roll models. The magazine article reveals that when they first started out the program in a regular classroom setting, with both boys and girls present, it didn’t works out. Because they found boys came forward while girls sat back as they normally would. That’s why they have come to the current, most ‘effective’ way.

Digital Divide

To understand the schools in their environment, we asked the rough percentage of students’ families using computers at home. The answers varied, from less than 10% to more than 70%. The difference can be seen as a facet of digital divide. 17 out of the 19 Korean schools surveyed answer that 50% and over of their students’ homes own computers. Home computer ownership seems quite remarkable in that country. Similarly remarkable was their answer denying that ICT education at school help overcome digital divide. They often alleged it was because computers were already in use at home. They may think that a little lesson at school would not help to solve digital divide and that could be true. However, before we do any judgment, we should ask what aspiration we have toward ICT education.

Expectations and Concerns



[Fig. 3: What Expectations Do You Have Toward ICT Education?]

The respondents often pointed out that there is too much game factor in ICT. In a different part of the Questionnaire, one said, “Some boys indicate that they are playing when they use computers.” In this specific part, there were several remarks to the effect that ICT education does not enhance students’ ability to think. We have also found people worry about addiction and unsolicited information. Then how can we expect ICT education to help overcome digital divide? What is good ICT education? What should be the goals of ICT education?

IV. Summary

Through this survey, we have learned that some countries regard the arrival of ICT a chance for national development, and accordingly, place high hopes on it. They have explicit expectations of ICT such as helping their children expand their horizon and pursue their career. At the same time, we have also learned that digital divide do exist due to lack or uneven provision of hardware and social infrastructure. Digital divide is seen between countries as well as within a country. We came across a literature, however, in which they assert that lack of independency on the part of the learner is one essential cause leading to digital divide. Another research we found proposes two concepts, namely ‘mind factor’ and ‘skill factor,’ as constituents of media literacy and asserts to gain command of ICT focusing on techniques is not enough but that the learner’s goal in life or proactive mindset toward information play a significant role. They seem to suggest whether an individual is willing or not is as

critical as the abundant facility/ brand new technology or the lack thereof in the emergence of digital divide.

Furthermore, with regard to limitation to furthering one's capability, even those who live in developed countries are not free from limitation. They could be faced with multitude of choices within a certain timeframe. For example, if they are to teach computers, they have to drop some subjects instead. Here we would like to quote a remark presented by a French respondent: "To make children capable of using computer is a skill in itself necessary in professional life, but also for higher education. In my opinion, computers do not increase children's social, mental, artistic, cultural, scientific, etc. abilities of knowledge any more than pencils, books, and notebooks." Here the author put ICT education in the broader context of cultural expression.

Time is a limited resource. In order to make best use of it, let us dare to propose an ideal ICT education now. "ICT education should awaken different interest of each child and bring out his/her abilities via well-designed materials and instruction. Through such practices, ICT education should aim at nurturing responsible individuals capable of selecting and exchanging information on the Internet."

The essence of the proposal was presented to Japan's Ministry of Education along with other proposals by the Japanese Association of University Women (JAUW) in winter 2003.