OECD/CERI ICT PROGRAMME
ICT and the Quality of Learning

A Case Study of ICT and School Improvement at
Honcho Elementary School, Yokohama, Japan

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Open School, Period of Integrated Study and ICT: A story of a School that have made a success in innovative curriculum and organization of teachers and peers.

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Fig.1 An Open Space

1. Overview

Honcho Elementary School has promoted the following innovations;
1) Open School, Open Mind project to remove various barriers in school and to open the school to the

community
2) Team teaching in activities within a grade or those between grades
3) Education on information literacy
4) Curriculum development oriented to learner-centered approach, autonomous / independent learning and the period of integrated study

Honcho Elementary School is located in the downtown of Yokohama City. The buildings were designed under the concept of open space . Ordinary classrooms have no wall to the corridor. A learning center on each grade and classrooms for special subjects, and a hall for multiple purposes were also prepared as open spaces . This school also has a large number of computers for teaching and learning. Internet and server computers were introduced from the early stage of its use in Japan.

The teachers organization is unique and different from those of other schools in this area. In most of Japanese elementary schools, one teacher teaches and manages for his/her class as a rule. In Honcho Elementary School, a team of teachers teaches and manages two or three classes of a grade in collaboration, and evaluate from the each teacher s view. This team teaching system has enabled flexible grouping of peers according to the needs. This system especially is beneficial to the period of integrated study called with Honcho No Jikan (Honcho s Hours) , in addition to the ordinary subjects.

ICT such as multimedia computers and the internet is utilized in many subjects, especially in Honcho No Jikan . Peers use such technologies to collect materials, to organize data and to present their results. According to the computer coordinator of this school, ICT and the period of integrated study were introduced almost simultaneously at the beginning. Both innovations were introduced as developmental research projects by the city board of education and the Japanese ministry of education. This school succeeded to change school organization and teaching methods/style. After the first project, the school participated in several major innovative projects in Japan and got successful results. The principal, ICT teachers, the computer coordinator and regular teachers pointed out that the benefits induced by the innovation via ICT, open space , team teaching and the period of integrated study, were spontaneous learning, motivation for learning, autonomy of peers and so on. Peers also acquired computer literacy, which was reported by the parent and peer by themselves.

Teachers also have changed not only their style of teaching but also their way to cooperate with colleagues. Many teachers became to be very familiar with the latest use of ICT in education. The interview with parents showed that this change was well recognized by parents.

The principal, teachers and parents seemed to be very favorable to such innovative changes of the school. What happened in school and students satisfied them. Also, as the school became very famous not only in the area but in Japan, it influenced their attitudes toward this innovation.

A key for the success of innovation in this school was that external agencies granted for their first introduction of computers just when the school tried to begin various innovations such as education of the period of integrated study in 1989. Once the school had the grants for computers, they needed the results of innovation using ICT promptly. Therefore, it was assumed that their computers had functioned as a strong catalyst for the innovation at that time. If they did not have the grants, their innovation might have been realized in an entirely different fashion. However, after accumulating various practices and experiences, the principal and most of teachers regarded ICT as one of educational tools and told us that they can realize the current innovative activities even if without ICT.

2. The past:
Honcho Elementary School was established in 1905 by Yokohama City. As is described in the previous section, the introduction of ICT in this school had started as a development project that was offered by the ministry of education and a board of education. According to the computer coordinator, at the beginning, teachers who were in charge of that project were confronted with various difficulties, and struggled how to realize the innovation using these computers.

The most important factor in this school is that they have continued to get various grants of the Japanese innovative projects, such as "100-School Networking Project". In other schools, financial lack was sometimes the crucial obstacle to continue and to develop the innovation using ICT. However, this school

has been successful to get funding not only from the district, also from projects subsidies. On the other hand, the role of financial supports has a kind of paradoxical aspect. To apply to grants and fellowships as innovative projects, they had to introduce new technology. Sometime, they could not easily find out the adequate way to use the latest technologies to achieve educational goals. The computer coordinator reported they established a group of teachers who developed and tried new teaching method/style.

The second point in their innovation was that they overcame the lack of computer literacy in teachers, especially in elderly teachers, and that they got solutions to make them utilize new technologies in achieving educational goals of the school and teachers. The principal and the computer coordinator reported that they had solved this problem by providing workshops and informal assistance on regular basis.

In many cases, according to his words, if teachers ability was improved, such problem was usually solved. The principal identified that the recent computer coordinator has taken a key role for this innovation. Regular teachers reported they have had sufficient supports from the coordinators and past leaders of projects.

3. The present:

Honcho Elementary School consisted of 26 teachers, 14 classrooms and 421 students (January 2001). The current teachers of this school had very good computer literacy. For example, in the ICT survey, they rated their own literacy on each items at the average under 3.0. Especially, word processing, Web-site search, e-mail was rated very high. In addition, the importance of computer related skills concerning teaching are

Fig.2 From a scene of Period of Integrated Study

highly evaluated about the average of 2.0. The only exception was programming skill that was poorly evaluated. Many teachers used ICT in their classrooms. The averaged scores were 1.4 2.8. While many teachers used often, we could still find some teachers had not used ICT at all at the survey. In addition, many teachers evaluated their literacy on computers very high. The average on item 30 was 1.905. In regard to evidence or policies, only item 36, 38, 39 and 40 teachers in this school showed positive attitude. In addition, in regard to 41-45, only four teachers were in charge of managing ICT equipments. Based on above quantitative data from the questionnaire, although ICT was used frequently and successfully in this school, ICT seemed to relate directly neither to the policy or goal of this school nor to that of teachers except the education of information literacy.

Even regular teachers reported they could use computers and the internet. They also understood well the advantage of ICT in education. ICT teachers were satisfied with the outcome of ICT use in his/her classroom. Both the principal and the computer coordinators stressed that such features of teachers had

induced various advantages to their school. However, the computer coordinator pointed out that the use of ICT was not all of their innovation, and that open space , team teaching, the period of integrated study are also the important educational practices. ICT is one of the most important tools to realize these characteristics.

Honcho Elementary School was described as an innovative school in regard to organization of school/teachers/pupils and curriculum/instruction that are realized by the use of ICT.

4. Main hypotheses:

Hypothesis 1:
Technology is a strong catalyst for educational innovation and improvement, especially when the World Wide Web is involved. The rival hypothesis is that where true school-wide improvement is found, technology served only as an additional resource and not as a catalyst, that the forces that drove the improvements also drove the application of technology to specific educational problems.

Evidence in support of the main hypothesis
No clear evidence.
However, it was suggested that technology can function as a strong catalyst in some phases of innovation (see Overview). At the intial introduction of ICT, once the school had got the grants for computers, they needed the results of innovation using ICT promptly. In addition, to keep the budget and grant for ICT, they studied the new possibility of ICT use in classrooms and in the school.
In addition, the specified aspects of practices were drastically improved by the use of ICT. The communication with distant people and access to digital learning resources were examples of this case.

Evidence in support of the rival hypothesis
In the interviews with the principal, the IT coordinator or teachers, they told repeatedly that, although ICT is the most important, ICT is one of the educational tools to realize their innovations. Except the case of the education of information literacy, in which ICT itself consists of the basic part of educational objectives, they insisted they could realize most of their innovative practices without the use of ICT although it may be in different fashions.

Hypothesis 2:
The diffusion of the innovation/improvement (and therefore of ICT) followed the traditional diffusion pattern for innovations, as outlined by Rogers (1995). The rival hypothesis is that technology functions differently from traditional innovations and that therefore different diffusion patterns occur.

The characteristics of the diffusion of ICT were as follows:
1) A leader or leader groups promoted the use of ICT
2) They also shaped an organization for ICT use in the school
3) Principals supported their activities
4) The school could get sufficient financial supports to realize their plan
5) Their activities were recoginized from the outside, that is, other schools, the community and the city board of education.

Evidence in support of the main hypothesis
In Honcho Elementary school also, the innovation was initiated by an excellent leader and technologies had been supported by him. If such situation had continued for long years, the innovation might have been interupted suddenly because of some reasons, such as his transference. However, they shaped the organization such as the committee for ICT , and shared his ideals and experinces with other colleages by seminars. In the process, the opportunities for discussions and those of exchanging ideas increased between the principal and teachers and among teachers. The principal stressed that it was essential to share the common objectives for the innovation with all of teachers, and to maintain the innovation as an organization. In addition, an ICT teacher insisted that teachers should acquire ICT literacy and know the new objectives

and pedagogy using ICT even if all of them do not use actually, in order to facilate the innovation.

Evidence in support of the rival hypothesis

No clear evidence.

Hypothesis 3:

Successful implementation of ICT depends mostly upon staff competence in the integration of ICT into instruction and learning. This hypothesis assumes that teachers mediate ICT applications when they are successful, and that ICT s academic value relates positively to teacher competence. The rival hypothesis is that the school technological infrastructure and student ICT competence rather than staff competence determine ICT implementation outcomes.

Evidence in support of the main hypothesis

In the interview, the principal, the IT coordinator and other teachers agreed with the importance of teachers in the integration of ICT into instruction and learning. In this school, various methods such as Committee for Infornmation Education and training seminars, were introduced to enhance teachers competence. As a result, teachers could utilize ICT more effectively and robustly, and it facilitated the actual use of ICT in the classroom.

Evidence in support of the rival hypothesis

No clear evidence.

Hypothesis 4:

Gaps in academic performance between high and low poverty students will not increase when all students have equal access to ICT. The rival hypothesis is that equal access to ICT will lead to more advantaged students increasing the performance gap with disadvantaged (high poverty) students.

As no interviewees had stood on such viewpoints, they could not understand the meaning of the question well in the limited time. As equal access to ICT have not realized in Japanese classrooms yet, they had not got any concrete data. Rather, they believed ICT will bring about new chances to disadvantaged students by opening the possibilities to be evaluated from many differnet viewpoints. A parent suggested the case of her reserved child . As the kid had been very shy, he/she had difficulties to get opportunities for communication and those of presentation by oneself. However, as he/she could became good at the use of computer and could utilize it as a medium for these purposes, he/she represented the self naturally and his/her life became more vivid and lively.

Evidence in support of the main hypothesis

No clear evidence

Evidence in support of the rival hypothesis

No clear evidence

Hypothesis 5:

Successful implementation of ICT will lead to the same or higher academic standards in spite of the low quality of many ICT materials. Academic standards are a function of teacher and school expectations and not of the standards of textbooks, ICT materials, and the like. The alternative hypothesis is that ICT use will lead to a lowering of academic standards as students spend more time on marginally beneficial searches and in browsing poor quality Web and courseware content.

They did not refer clearly to the relation between their academic standards and the quality of ICT materials.

Evidence in support of the main hypothesis

No clear evidence

Evidence in support of the rival hypothesis
No clear evidence

5. Projection to the future:
The principal, the computer coordinator, the ICT teacher, all of them believed this innovation would continue. The ICT teacher said this innovation was the request from the next generation; the computer coordinator predicted many schools tried to catch up with their school; the principal pointed out teachers in this school had already shifted their vision of education. On the other hand, some of regular teachers had remained conservative standpoints against the innovation, although they showed understanding on the advantages of it.
To sum up their opinions, the requirements of the diffusion to other schools are good vision, open mind toward innovation, sufficient staffing, and budget. They predicted that the diffusion of the innovation in the school will continue within and outside the school, and that teachers will be a key factor because they can be a catalyst or an obstacle toward their innovation.
Many people also pointed out the necessities to overcome the dark side of ICT use. Both teachers and parents recognized the real experiences would be more necessary as virtual environments are introduced into educational fields. ICT is one of the effective tools for education and its introduction is not the final goals of education. The educational goals should be discussed from more holistic view.

6. Appendix A: Methodology:
Four researchers and one graduate student participated in the date collection. The team spent almost all of three consecutive days. The team had interviewed the principal, one computer coordinator of the school, one ICT teacher, two regular teachers, peers, parents. Each interview had lasted about one hour, sometimes one and a half hour. In addition, documents such as a booklet of the school, several reports of project were collected. An ordinary classroom lesson and that of integrated study were recorded by video...

7. Appendix B: **Tables for Teacher ICT Practices Survey**

How comfortable are you with using a computer to do each of the following? (Choices are: very comfortable, comfortable, somewhat comfortable, and not at all comfortable)

		very comfortable	comfortable	somewhat comfortable	not at all comfortable	No Answer
1	write a paper	8	10	3	0	0
2	search for information on the World Wide Web (WWW)	6	8	6	1	0
3	create and maintain web pages	2	3	9	7	0
4	use a data base	1	9	4	7	0
5	develop a data base	0	5	8	8	0
6	send and receive e-mail	8	5	5	2	1
7	write a program	0	2	4	15	0
8	draw a picture or diagram	3	5	8	5	0

| 9 | present information (e.g., use PowerPoint or equivalent) | 3 | 3 | 10 | 5 | 0 |

How important is each of the following computer-related skills for your teaching? (Choices are: very important, important, so-so, and not important at all)

		very important	important	so-so	not important at all
10.	write a paper with a word processor	6	11	3	1
11.	search for information on the WWW	4	11	4	2
12.	create Web pages	2	6	11	2
13.	use a data base	3	9	6	3
14.	develop a data base	1	7	9	4
15.	send and receive e-mail	6	8	5	2
16.	write a program	1	3	11	6
17.	draw a picture or diagram with a graphing/drawing application	5	8	8	0
18.	present information (e.g., use PowerPoint or equivalent)	3	12	4	2

During the past school year, how often did your students on average do the following for the work you assigned? (Choices are: several times each week, several times each month, a few times, never)

		several times each week	several times each month	a few times	never	No Answer
19.	use the World Wide Web	3	4	9	0	5
20.	create web pages	0	1	8	7	5
21.	send or receive e-mail	3	3	6	4	5
22.	use a word processing program	5	6	2	2	6
23.	use a computer to play games	3	5	5	3	5
24.	use a spreadsheet	0	4	4	8	5
25.	use a graphics program	0	3	7	6	5
26.	join in an on-line forum or chat room	0	0	4	12	5

27.	use a presentation program (e.g., PowerPoint)	0	4	7	5	5
28.	use an instructional program (including simulations)	1	1	7	7	5
29.	other computer uses (specify)	0	0	5	10	6

30. How would you rate your ability to use a computer? (Choices are: good, fair, poor)

		good	fair	poor	No Answer
30.	ability to use a computer	2	13	4	2

Answer questions 31-38 based on experiences or policies from the last school year.

31. Was student computer use ever evaluated for grading? (yes-no)

		yes	no
31.	evaluated for grading	4	11

32. If you assigned World Wide Web searching, how much freedom did you allow students in locating sites to visit? (no restrictions, some restrictions, designated sites only)

		no restrictions	some restrictions	designated sites only
32.	how much freedom did you allow students in locating sites to visit?	5	5	5

33. Did you create or modify a Web site with any of the classes that you taught? (yes-no)

		yes	no
33.	Did you create or modify a Web site with any of the classes that you taught?	4	11

34. What portion of the computer use in your classes was directly related to the course content? (all, most, some, very little)

		all	most	some	very little
34.	What portion of the computer use in your classes was directly related to the course content?	1	5	6	3

35. What portion of the computer use that you assigned was done by students individually? (all, most, some, very little)

		all	most	some	very little

35	What portion of the computer use that you assigned was done by students individually?	1	7	6	1

36. If you have a computer at home, how often did you use it for preparing for teaching? (several times a week, several times a month, a few times, never, no computer)

		several times a week	several times a month	a few times	never	no computer
36	If you have a computer at home, how often did you use it for preparing for teaching?	9	4	1	1	6

37. Did you participate as a student or instructor in a virtual course through the Internet/World Wide Web? (yes-no)

		yes	no
37.	Did you participate as a student or instructor in a virtual course through the Internet/World Wide Web?	0	15

38. Did you involve your students in collaborative learning over the Internet/World Wide Web with students from other classes? (yes-no)

		yes	no
38.	Did you involve your students in collaborative learning over the Internet/World Wide Web with students from other classes?	9	6

39. Are you currently using technology to collaborate with other teachers (professional chat rooms, forums, or the like)? (yes-no)

		yes	no
39.	Are you currently using technology to collaborate with other teachers?	9	6

40. How many e-mail messages do you send each week on average? (more than 12, 6-11, 1-5, none).

		more than 12	6-11	1-5	none
40.	How many e-mail messages do you send each week on average?	5	2	6	2

How many of the following have you ever done?
41. made changes to a computer s hardware

	Frequency
0	10

1	2
2	1
5	2
7	1
No Answer	5

42. updated an application program (word processor, graphics program, etc.)

	Frequency
0	9
1	1
3	1
4	2
5	1
10	1
50	1
No Answer	5

43. recovered a damaged file

	Frequency
0	12
1	1
3	1
5	1
20	1
No Answer	5

44. created a web site

	Frequency
0	9
1	2
3	1
4	1
5	1
10	1
80	1
No Answer	5

45. developed a data base

	Frequency
0	12
2	1
3	1

5	2
No Answer	5