日本の教育システムにおける教室での ICT の利用

UTILIZATION OF ICT IN THE CLASSROOM FOR JAPAN EDUCATION SYSTEM

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ABSTRACT

UTILIZATION OF ICT IN THE CLASSROOM FOR
JAPAN EDUCATION SYSTEM

Information and Communication Technology (ICT) in education is expected to be a great potential to change the environment in the classroom. When ICT is used properly, it can be helpful to enhance the quality of teaching and improve the effectiveness of learning.

Between countries, there is such a diversity and disparity in ICT use. How each country utilizes ICT depends largely on the countries' ICT readiness in the area such as infrastructure, policy in ICT in education, teachers' competency, and pedagogical use when integrating ICT into the classroom. Lessons can be learned from country experiences in integration ICT in education. The purpose of this research is to study on how Japan promotes utilization of ICT in education especially in teaching and learning session in school. Computerization classroom is not common even though Japan enjoys the world highest broadband speeds and lowest consumer cost.

Starting 2010, New Strategy in ICT (Education) has been introduced. The main objective is to create an environment of the 21st Century to upgrade student's capability in utilizing the ICT and also promote ICT-based lifetime learning opportunities in the society. Ministry of Education, Culture, Sports, Science and Technology (MEXT) has been collaborated with Ministry of Internal Affairs and Communications(MIC) to set up the Future School Promotion project. The project provides ICT-environment in classroom and conduct experimental studies with emphasis on the technical aspects with the objective of compiling guidelines. The guideline will be used to expand the coverage of ICT-utilized teaching to other school.

It is hoped the study can give some useful information for many countries that would like to integrate ICT into education and utilize ICT tools in teaching and learning. This can be valuable information about the potential utilization of ICT in education and offer some ideas of ICT to improve the quality of education.

要旨

日本の教育システムにおける教室での ICT の利用

教育における Information and Communication Technology(ICT)は教室の環境を変える大きな可能性があると期待されています。ICT が適切に使用された場合、教育の質の向上、学習の有効性の改善に役立つ可能性があります。

国々の間には ICT 利用に多様性と格差があります。各国がどのように ICT を活用しているかは、情報通信技術　、即応性　、面積　、インフラ、政策、情報通信技術、教育、方針、教師の能力、方針における教育的な使用に大きく依存します。授業ではその国の統合 ICT 教育の経験から学ぶことができます。

本研究の目的は、日本の教育と学習活動における ICT 活用のあり方を研究することです。日本では世界最高のブロードバンド速度かつ最低の消費者コストでありながら教室における情報化のことが当たり前とは言えません。2010 年から ICT 教育には新戦略が導入されました。

その新戦略の主な目的は、21 世紀の環境を作り、生徒の ICT 能力を高めることと社会に ICT ベースの生涯学習を推進することです。文部科学省が総務省と共同でフューチャースクール推進プロジェクトを設定しました。

そのプロジェクトは教室に ICT 環境を設置し、 ガイドラインを編集するいとを目的に技術的側面を重視した実験的研究を行うものです。前述のガイドラインは ICT 活用教育の範囲を他の学校に拡大するために使用されます。

教育学習において ICT シールを活用していきたいこと考えている多くの国々の為に、この研究は有用な情報を提供することができます。本研究は教育における ICT 利用の可能性に関する貴重な情報として、教育の質を向上させるにめに ICT を提供することを目指します。

CHAPTER 1

THE PROBLEM AND SETTING

1.1 Introduction

Information and Communication Technologies (ICT) refers to technologies that provide access to information through telecommunications. It is similar to Information Technology (IT), but focuses primarily on communication technologies. This includes Internet, wireless networks and other communication medium (Techterms.com,2010).

But the definition of ICT are varied, it might be useful to accept the definition provided by United Nations Development Programme (UNDP):

> "*ICT are basically information-handling tools- a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information. They include the 'old' ICT of radio, television and telephone, and the 'new' ICT of computers, satellite and wireless technology and the Internet*." (Reddi,2006)

The ICT technologies have a big implication on school and education. Referring to *The Vision for ICT in Education* by Ministry of Education, Culture, Sports, Science and Technology(MEXT,2011), in schools, where are the major place for children's learning and daily life, ICT utilization in education should be promoted with teachers fulfilling their duties and utilizing ICT in a manner that makes the most of its features. Such effort will promote individualized learning responding to each child's abilities and personality. ICT also include collaboration learning where children can teach and learn among themselves, along with conventional mass learning by class guidance all at once.

Teacher can transform their practices when they were provided with improved educational content and more effective method by using the ICT. It also will improve the learning process by using more interactive educational material which can increase student's motivation and facilitate the acquisition of basic skills.

Usage of multimedia devices in lesson like television, visualizer, video, and computer software can give them more challenging and engaging learning environment.

1.2 The purpose of study

The main purpose of this report is to study the use of ICT in Japan education. It also concern on how Japan promotes utilization of ICT in education especially in school. It is becoming increasingly important for students to acquire the ability to utilize information and respond proactively to the Information Society by using ICT. In addition, it is necessary for teachers to effectively utilize ICT in order to achieve easily understood lessons and work more efficiently.

1.3 Significance of the study

ICT are advancing in all areas of society especially in education.MEXT is therefore actively engaged in introducing ICT into school education. Digital Opportunity Index(International Telecommunication Union,2011) ranked Japan as Number 2, leading the world in connectivity. The infrastructure of ICT in Japan is one of the best in the world. It is just how to promote and advance the utilization of ICT in education especially schools. It is hoped that within this study, it can give valuable information for teachers and students to integrate and get connected with ICT in education.

CHAPTER 2

EDUCATION SYSTEM OF JAPAN

2.1 Brief overview of Japan Education

The basic principles for Japanese education are defined in the Constitution of Japan in 1946 and the Fundamental Law of Education enacted in 1947.

> *"All people shall have the right to receive an equal education corresponding to their ability, as provided by law. The people shall be obligated to have all boys and girls under their protection receive ordinary education as provided for by law. Such compulsory education shall be free."(Article 26).*
>
> *(MEXT,2008)*

In light of such circumstances, the existing Basic Act on Education was completely revised and the revised law established in December 15, 2006. The revisions to the law clearly set out principles for education considered to be extremely important today while at the same time inheriting the universal principles set out in the previous law. Such principles include placing value on public-spiritedness and other forms of the "normative consciousness" that the Japanese people possess, as well as respecting the traditions and culture that have fostered said consciousness.

In addition, the Basic Act on Education prescribed that the "Basic Plan for the Promotion of Education" be formulated to lay down the basic policies and measures to be taken to promote education. The first comprehensive plan by the Government about education was formulated on July 1st, 2008(Mext,2008).

2.2 Japan Education System

The school system in Japan is generally called '6:3:3:4 year' which is elementary school acted as the foundation stage of the entire school system. The system is divided into kindergarten, elementary school, lower secondary school, upper secondaryand institute of higher education. The compulsory education is from elementary school to lower secondary school only.

Tuition fee (MEXT Tuition,2013) for both public and private elementary and junior high school is free. To encourage students to continue their study, starting 2010, tuition fee for public high school is free and establishes the high school enrollment support fund system for tuition payment for private high school students.“Act on free tuition fee at public high schools and high school enrollment support fund” was passed on March 31 and was enacted on April 1, 2010. The main purposes of the Act are to help to ease family educational expenses and to contribute to equal opportunity in upper secondary education.Figure 1.1 showed the education system in Japan and the duration for each level.

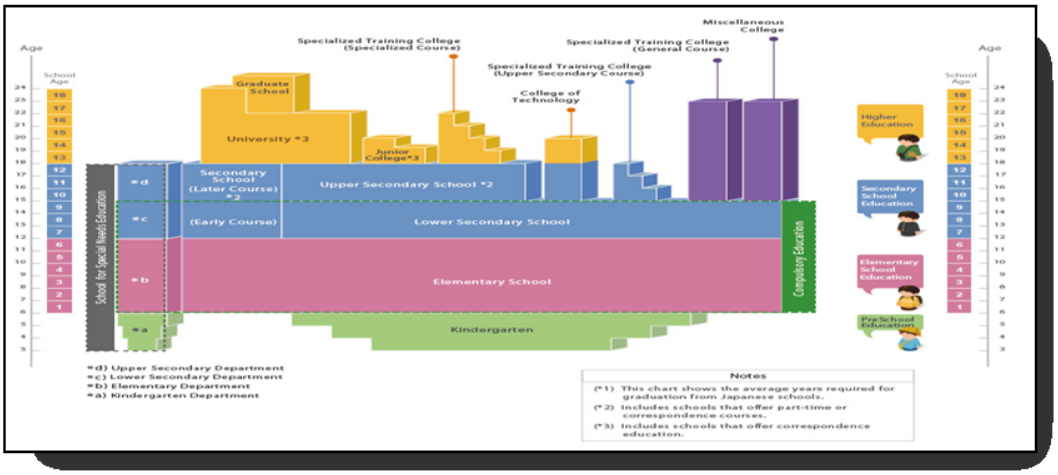


Figure 1.1 Japan Education System

The characteristic for each level of formal education are shown below(MEXT,2008).

1. Kindergarten (*Yochien*)

   It is non-compulsory education. The purpose is to help the children with an appropriate fun learning environment before they go to the real school environment. Kindergarten start from children aged 3 and above.

2. Elementary Schools (*Shougakko*)

   All children who have their 6th birthday on, or before April 1will enter the first grade of elementary school of that year (Tokyo Communication Committee,2006). This is a compulsory education. All children have to attend elementary school for 6 years. Elementary school provides a general education suited to the relevant stages of their mental and physical development.

3. Lower Secondary Schools (*Chuugakko*)

   After elementary school, it is compulsory for the student to attend lower secondary school for 3 year. It is general secondary education suited to the level of development based on the education given in the elementary school.

4. Upper Secondary Schools (*Chuuto-kyouiku-gakko*)

   It is non-compulsory school. The purpose is to give lower secondary graduates general and specialized secondary education suited to their level. The upper secondary can be divided into 3 categories; full time, part time and correspondence students. Duration for full time student is 3 years but part time and correspondence student can be more. Part time student will have either day or evening courses.

5. Special Schools and Classes for Disabled (*Tokubetsu-Shien-gakko*)

   The main objective of this school is to provide children with comparative serious disabilities with equivalent education. It is available for kindergarten, elementary and secondary school.

   At the same time, the school will prepare the student with necessary knowledge and skills needed to make up for the student's deficiencies .There are 3 types of special schools which are;

   i. Intellectual disabilities
   ii. Physical disabilities
   iii. Health impairment

   For the student whose disabilities are not very serious, special classes in ordinary elementary and lower secondary school are provided. These special classes are categorized into 7 types of the disabilities of the children;

   i. Intellectual disabled
   ii. Physical disabled
   iii. Health impaired/physically weak
   iv. Sight impaired
   v. Hearing impaired
   vi. Speech impaired
   vii. Emotionally disturbed

They can take standard subject in regular class but at the same time they will have supplementary courses for them. They will receive a special instruction in special class according to their disabilities.

6. Institution of Higher Education

Higher education in Japan includes universities, junior college, college of technologies and special training schools.

Admission for university and junior college is based on the scholastic achievement test which is include National Center for University Entrance Examination and other test to evaluate student's abilities and aptitudes.

i. Universities (*Daigaku*)

University is an institution which always being a center of learning, conducting teaching and research in depth of specialized academic disciplines. University required the student to complete their upper secondary school or its equivalent for admission. Usually university has undergraduate faculties or other basic unit for educational activities. Basically it takes 4 years to complete the undergraduate courses. But for medical related courses, it will take 6 year or more to accomplish. Most of the university has a graduate school for the student to pursue their studies in Master degree(2 years), Doctoral degree(5 years accept 4 years for medical related courses) or Professional degree(2 years accept 3 years for law courses).

ii. Junior College (*Tanki-Daigaku*)

The main purpose of junior college is to conduct teaching and research in specialized subjects. It also helped to develop student's ability which is required for vocational and practical life. Same with university, junior college require the student to complete their upper secondary school or its equivalent for the admission. It offers many courses in various fields in duration of 2 or 3 years to accomplish.

iii. College of Technologies (*Koto-Senmon-gakko*)

To go to college of technologies, student only have to complete their lower secondary school. The main objective is to conduct in depth teaching in specialized subject and at the same time to develop student's required abilities for vocational life. The duration for most of the course is 5 years.

iv. Special Training Schools (*Senshu-gakko*) and Miscellaneous schools (*Kakushu-gakko*)

For the student who did not excel in academic, the can consider Special Training schools or Miscellaneous school. They offer systematic educational activity similar to formal education irrespectively the academic qualification of entrants.

The main objective is to help students develop the required knowledge and skills for vocational and daily life.The course can be divided into 3 categories;

i. Upper secondary courses admitting lower secondary graduates
ii. Advance courses admitting upper secondary school graduates
iii. General courses (do not require specific academic background)

The schools are required to maintain 40 students for each enrollment to offer courses lasting at least 1 year. Each course provided 800 hours or more instruction hours per year. Starting from 1999, special training college graduate with certain requirements have been allowed to transfer it to universities.

2.3 Course of Study

MEXT determines the standard of education for school throughout the country. Generally, the Course of Study is revised by MEXT in every 10 years. As Chart 2.2 shown below,elementary and lower secondary schools were revised in March 2008 and for those Upper Secondary schools and schools for special needs education were revised on March 2009.

Referring to MEXT;

> *"The new Courses of Study continue to aim to nurture in students "Zest for life" based on the educational principles expressed in the revisions to the Basic Act on Education. The new Courses of Study enrich the content of education and increase the number of classes, with an emphasis on the balance between acquiring basic and fundamental knowledge and skills and fostering the ability to think, make decision, and express oneself."*
>
> *(MEXT Course of Study,2013)*

National Assessment of Academic Ability in Mathematics and Japanese for students has been carried out for 6th grader in Elementary school and 3rd year student in of Lower Secondary school. Result of the assessment has been a benchmark to improve educational policies and classroom teaching method.

Although the new Course of Study is to be applied fully for the students who enter high school in 2013, the content relating to Mathematics and Science is to be applied in advance for the students who enter in 2012.

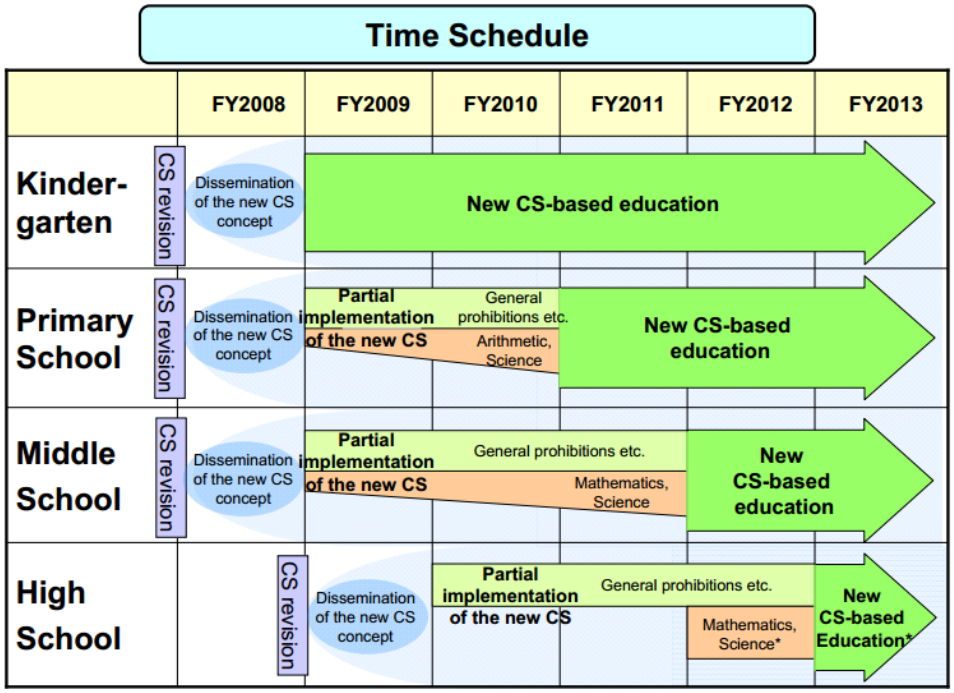


Figure 2.1 Time Schedule for New Course of Study (MEXT Revision,2013)

2.4 Enrollment of students

For administration of school education, MEXT has been carrying out the Basic School Survey every year since 1984.

Referring to the FY2012 Basic School Survey(MEXT Statistik,2013), the enrollment of students is shown as below;

2.4.1 Number of schools

FY	Total	Kindergarten	Elementary School	Lower secondary school	Upper secondary school	Secondary school	School for the blind	School for the deaf
2010	58,418	13,392	22,000	10,815	5,116	48	･･･	･･･
2011	57,845	13,299	21,721	10,751	5,060	49	･･･	･･･
2012	57,312	13,170	21,460	10,699	5,022	49	･･･	･･･

FY	School for the other disabled	Schools for special needs education	College of technology	Junior college(2)	University(1)	Specialized training college	Miscellaneous school
2010	···	1,039	58	395	778	3,311	1,466
2011	···	1,049	57	387	780	3,266	1,426
2012	···	1,059	57	372	783	3,249	1,392

1. Not including 6 universities providing correspondence courses only (Universitiy of the Air and 5 private university).

2. Not including 1 junior college providing correspondence course only (1 private junior college).

2.4.2 Number of students enrollment

FY	Total	Kindergarten	Elementary School	Lower secondary school	Upper secondary school	Secondary school	School for the blind	School for the deaf
2010	19,541,832	1,605,912	6,993,376	3,558,166	3,368,693	23,759	···	···
2011	19,430,606	1,596,170	6,887,292	3,573,821	3,349,255	26,759	···	···
2012	19,283,319	1,604,225	6,764,619	3,552,663	3,355,609	28,644	···	···

FY	School for the other disabled	Schools for special needs education	College of technology	Junior college	University	Specialized training college	Miscellaneous school
2010	···	121,815	59,542	155,273	2,887,414	637,897	129,985
2011	···	126,123	59,220	150,007	2,893,489	645,834	122,636
2012	···	129,994	58,765	141,970	2,876,134	650,501	120,195

2.4.3 Enrolment and advancement rate of students

FY	Kindergarten (1)	Compulsory Education		Upper secondary level	
		Elementary School	Lower secondary school		Upper Secondary school (2)
2010	56.2	99.96	99.97	98.0	96.3
2011	55.7	99.95	99.96	98.2	96.4
2012	55.1	99.95	99.96	98.3	96.5

(1) Kindergarten graduates as a percentage of enrollment in the 1st year of elementary school.

(2) Excluding those advancing to corresponding courses of upper secondary school. Figures include completion number of lower division of secondary school

FY	University and Junior College (3)		Special Training School
		University and Junior College (4)	
2010	54.3	54.3	15.9
2011	53.9	53.9	16.2
2012	53.6	53.5	16.8

(3) New graduates from upper secondary school who advance to university and junior college upon graduation, as a percentage of the total upper secondary school graduates for each year. Figures include new graduates of upper division of secondary school.

(4) Excluding those advancing to correspondence courses of universities and junior colleges.

2.4.4 The Classroom

The student-teacher ratio(OECD,2010) for 2010 is 18 students for every teacher in primary school and 12 students for every teacher in secondary school.

Meanwhile, the average class size in Japan for 2010 is 28 students per class for primary school and 33 students per class for lower secondary school.

CHAPTER 3

ICT INTEGRATION AND UTILIZATION

3.1 ICT in Japan Education

ICT in Japan Education has been introduced in the first report of National Council on Educational Reform (June 1985). Following of the publication and based on the Curriculum Council (December 1987), the Course of Study published in 1989 introduced the new elective subject "basic information" into technology and home economics classes at lower secondary school. Furthermore, based on the report of the Curriculum Council of July 1998, the Course of Study published in the same year designated the subject "information and computer" in technology and home economics classes at lower secondary schools a compulsory subject, and also established a new compulsory subject "information" for general education courses at upper secondary schools.

Information Technology in Education Project (ITEP) was launched in 1999 with the aim that all elementary and secondary school should use computers in teaching by 2005. The specific of the plan included:

- Installation of computers with Internet access in all ordinary classroom by 2005
- Creation of training opportunities for teachers to improve their computer skills and enable them to use computers in teaching their subjects
- Development of visual and video contents appropriate for teaching
- Research and development of teaching method that use high-speed network
- Creation of teaching material portal site at the National Institute for Educational Policy Research

However, by 2003 only 29.2% of classroom in public schools were connected to the Internet .The Figure3.1shown the internet connection for the classroom in public schools.

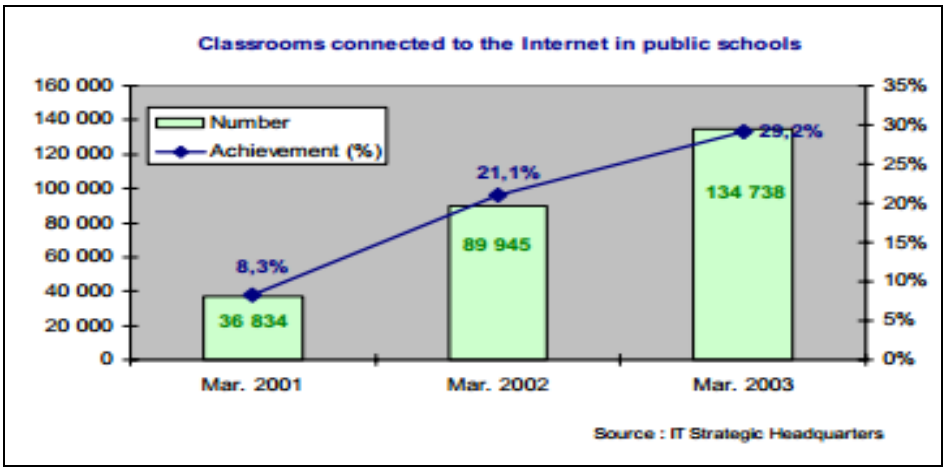


Figure3.1 Internet Connection for the Classroom in Public Schools

IT Strategic Headquarters for the Promotion of an Advanced Information and Telecommunications Network Society was established in 2001 to make Japan the world most advanced IT nation by 2005. The promotion of the use of ICT was published as e-Japan Strategy. The guidance(Vallance,2008) for primary and secondary school were included as;

1. To cultivate children's ability to use information through computers or the Internet, so as to respond independently to an information and communication based society
2. High-speed Internet connection in all public school to be achieved in 2005
3. Internet connection via local area network in all classrooms to be achieved in 2005
4. One computer per person in computer room. The ratio of 5.4 children per computer for educational use to be achieved in 2005
5. The acquisition of IT application to be achieved in 2005

However, the ICT utilization in education is not been successful advancing with other industrialized country. Regarding to OECD's 2009 Program for International Student Assessment (PISA) has revealed following problems(OECD,2009):

i. The number of children with lower achievement levels is larger in Japan than the high-ranking countries
ii. Japanese children are good at finding and extracting the necessary information from reading materials but poor at understanding the correlations among elements of such

information, making their own interpretations, and connecting obtained information with their own knowledge and experience

iii. Japanese children's mathematical literacy is above the OECD average but far below the level of t the high-ranking countries

Referring to the Vision for ICT in Education (MEXT,2011), IT Strategic Headquarters has realize the suitable school environment is aiming of fully utilizing ICT in 2010. IT Strategic Headquarters has decided to;

i. make classes more interactive and easy-to-understand, through teaching and learning among students themselves,
ii. reduce burdens of teachers and other school staff.
iii. enhance children's information literacy.

On June 22, 2010, the IT Strategic Headquarters decided upon the roadmap for this strategy, showing concrete measures to be taken at respective ministries and agencies for short-term period (2010 and 2011), mid-term period (2012 and 2013), and long term period (2014).

3.2 Roles of ICT in education

The ICT utilization in education aims to enhance quality of education for three aspects:

i. Students' information literacy
ii. Utilization of ICT in course instruction
iii. Introduction of ICT for school administrative works

For the students, ICT will promote individualized learning responding to each child abilities and personalities. ICT can provide collaborative learning where the student can teach and learn among themselves and with conventional mass learning by class guidance all at once.

The role of ICT for teachers is to help in course instruction. Teachers can utilize ICT to emphasize certain images, or choose video and audio materials to raise children's interest in learning and easier explanations for the students to understand. The students can acquire fixed knowledge and skills through repetitive learning.

Students can collect, select, and accumulate pieces of information to compile them into documents and charts for presentation; teachers and children exchange information using ICT which enables interactive class activities. All these are considered to encourage children to understand material contents more deeply and express themselves more positively.

For school administrative works, there are schools which provide a system to input and share information among teachers. There are also survey results showing that the introduction of a school administrative support system has increased hours for teachers to directly teach children by 30 minutes or more per day.

3.3 Utilization of ICT in learning

Utilization of ICT in education has been brief in The Vision for ICT in Education (MEXT,2011). It has been divided into:

1. Digital textbook

   The digital textbooks contain the existing textbook and have functions contributing to make the lesson easier to understand for the students.

   Many textbook publishers have been developing these digital textbooks considering it to display at interactive white boards and following the revision of the Courses of Study. The number of interactive white boards equipped in public schools under the first supplementary budget of 2009 was around 56,000 (interactive white boards are equipped at nearly 60% of the total), having increased from around 16,000 in the previous fiscal year according to the 2009 “Survey Results Regarding the Informatization of Education”.

2. Information terminals, digital equipment and network Environment

   Based on the 2009 “Survey Results Regarding the Informatization of Education”, the rate of ordinary classroom equipped with intra-school LAN was around 81%, schools equipped with fiber optic cable network was around 67% and schools with Internet connection speed over 30Mbps was around 66% (March 2010).

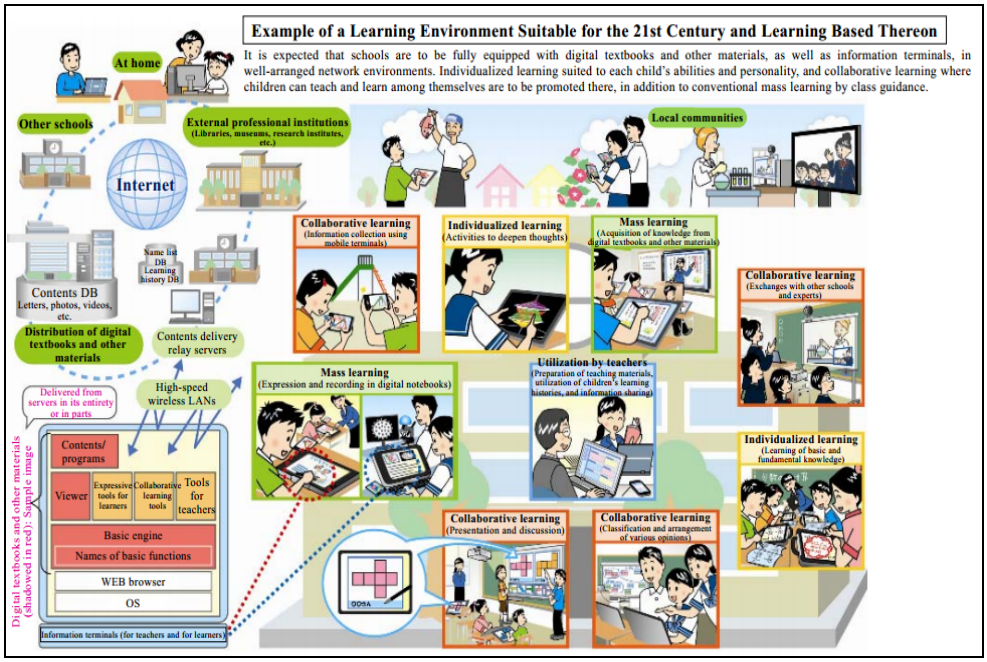


Figure 3.2 Example of Learning Environment Suitable for 21st Century

3. ICT for school administrative works

Introduction for school administrative works will contribute to the management of school register, attendance, grades, health records and book. At the same time various of information can be shared such as guidance and teaching plan, digital teaching material and student learning histories. It can be share among teachers, families and local community via school website and e-mails.

Table 3.1 shown the details of the numbers of computer and the ratio of connectivity from Basic School Survey 2012 (E-Stat,2013)

学校種	Cのうち、教員の校務用コンピュータ台数 PC for office work F	教員の校務用コンピュータ整備率 Ratio office work computer F／B	Fのうち、校内LAN接続コンピュータ台数 LAN computer G	教員の校務用コンピュータの校内ＬＡＮ整備率 ratio of LAN connection G/F	普通教室数 the number of common classroom H	Hのうち、ＬＡＮに接続している教室の数 the number of PC with LAN connection I	普通教室における校内LAN整備率 Ratio I／H
	台	%	台	%	室	室	%
小学校	(399,615)	(100.1%)	(369,826)	(92.5%)	(260,525)	(212,248)	(81.5%)
	421,081	105.8%	393,597	93.5%	261,532	215,644	82.5%
中学校	(225,131)	(97.8%)	(208,807)	(92.7%)	(109,562)	(88,414)	(80.7%)
	241,042	104.4%	224,846	93.3%	111,019	90,832	81.8%
高等学校	(210,467)	(118.6%)	(192,266)	(91.4%)	(69,544)	(65,127)	(93.6%)
	215,384	121.8%	196,959	91.4%	69,624	65,094	93.5%
専門学科・総合学科 単独及び 複数学科設置校	(119,170)	(121.7%)	(110,721)	(92.9%)	(35,661)	(32,975)	(92.5%)
	122,517	125.7%	113,410	92.6%	35,779	33,035	92.3%
中等教育学校	(1,411)	(120.2%)	(1,258)	(89.2%)	(519)	(505)	(97.3%)
	1,563	121.6%	1,313	84.0%	558	544	97.5%
特別支援学校	(65,549)	(94.4%)	(61,441)	(93.7%)	(25,189)	(22,690)	(90.1%)
	70,149	99.0%	66,166	94.3%	25,646	23,145	90.2%
合　計	(902,173)	(102.8%)	(833,598)	(92.4%)	(465,339)	(388,984)	(83.6%)
	949,219	108.1%	882,881	93.0%	468,379	395,259	84.4%

Table 3.1Computers in school for office work

4. Support system for teachers

Teachers are expected to play further significant roles in ascertaining respective student's abilities and characteristics, in order to prepare learning opportunities for them accordingly. Teachers should be trained to have an attitude not only to foster children's appropriate information literacy through the utilization of ICT but also to improve their own teaching methods as a whole to ensure high-quality education.

According to the 2009 "Survey Results Regarding the Informatization of Education"(MEXT,2011);

(i) The ability to utilize ICT in studying teaching materials, preparing classes, and evaluating students: 73.9% (by prefecture: max. 86.8% and min. 67.9%)

(ii) The ability to utilize ICT in class guidance: 58.5% (by prefecture: max. 78.2% and min. 50.5%)

(iii) The ability to teach children how to utilize ICT: 60.3% (by prefecture: max. 78.0% and min. 53.2%)

(iv) The ability to teach information morals: 68.6% (by prefecture: max. 84.0% and min. 60.1%) (

(v) The ability to utilize ICT in school administrative works: 69.4% (by prefecture: max. 83.1% and min. 60.5%)

It is important to promote the utilization of ICT in education comprehensively in a planned manner from the aspect of software, hardware and personnel.

MEXT has decided to conduct research, in close collaboration with MIC, at the same school,responding to the environment where one student is provided with one information terminal. “Future School Promotion Project” has been started in 2010 in collaboration of MEXT and MIC. “Learning Innovation Project” also started in 2011 for MEXT to conduct empirical research mainly in the aspect of software and personnel in education(MEXT,2011).

3.4 Future School Promotion Project

3.4.1 Background and purpose

Ministry of Education, Culture, Sports, Science and Technology (MEXT) in cooperation with Ministry of Internal Affair and Communication (MIC) is implementing Future School Promotion Project as a specific policy to promote beneficial use of ICT in the education (MIC, 2011).

MEXT is considering to foster the skills to live in 21st Century society, conducting variety of studies tailored for students in various type of school, age, curriculum contents and other with following objectives:

1. Verification of the effectiveness/influence of education using digital textbook and materials
2. Development of teaching methods
3. Compilation of model curriculum digital contents

The objective of MIC is also to foster the skills to live in 21st Century society but by providing a wireless LAN (Wi-fi) and tablet-type computer for student. They want to develop an experimental program with an objective bellows:

1. Sort out optimal technical requirements for development and operation of ICT-equipment and ICT-network environment (including the cloud computing facilities)
2. Summary of know-how to develop and operate in school ICT-environment.

3.4.2 Outline of the Future School Promotion Project

This project (MIC,2013) is to promote utilization of ICT in education, institute ICT environment in classroom and conduct experimental studies with an emphasis on the technical aspects with the objective of compiling guidelines (manuals) as shown in Figure 3.4. Most of the information will be used to expand the coverage of ICT-utilized teaching to other schools.

Figure 3.4 Outline of Future Promotion School Project

3.4.3 Accomplishments to date

Experimental studies started in 10 primary schools in 2010. Starting 2011, 8 junior high school and 2 special support school have been added in the project and concurrently the "Learning Innovation Project" of MEXT was started in the same 20 schools. Each student in the class was given 1 Tablet PC. The classroom is equipped with Wi-fi-accessed LAN. All schools implement classroom teaching using the equipment to verify necessary know-how in ICT-environment, security requirement and more.

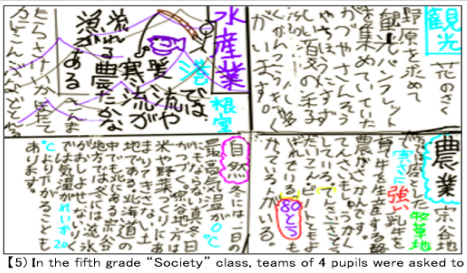
3.4.4 Time Frame

This is 4 years project as for primary school (2010 – 2012) and junior high schools and special support schools (2011 – 2013).

3.4.5 Example of the activities in school

1. Elementary school

Exercise in the use of IWB	The state of the use of tablet PC	Problems
・Using the digital simili paper in the tablet PC, pupils in groups practice collaborative learning on IWB. Such exercises were used to spread collaborative learning to be used by the entire class	・In addition to use in Japanese language, arithmetic, society courses, etc., through the use of ancillary devices such as digital simili paper and USB camera, coverage of curriculums have been expanded to drawing and manual arts, music and even to physical education ・Because each pupil learns at his/her own pace, all pupils in classrooms concentrate on classwork	・The project confirmed that teaching skills of experienced teachers are reflected on test results obtained in ICT-utilized teaching, implying that skill improvement of younger teachers is important

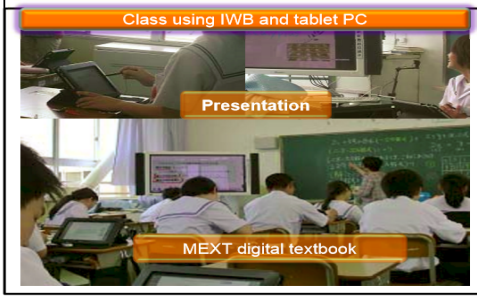


【5) In the fifth grade "Society" class, teams of 4 pupils were asked to develop speech presentations on digital simili paper on the tablet PC. Note the use of drawings and emphases using colored characters】

【6) In the second grade "Living Environment Studies" class, collecting information in a local shopping area and recording their data in the tablet PC. They edited the materials at the school, presented their reports and recorded comments made by their classmates】

2. Junior high school

Current status of Use of Tablet PC and IWB	Issues & Point to Remember
1. English: Take the digital camera image of the treasure into the PowerPoint in the tablet PC, add comments in English and send the image displayed on the tablet PC to IWB for presentation (second grade) 2. Visiting Canada: Each pupil takes a set of Wi-Fi router (WiRT) and Android Terminal to the Canadian homestay. Pupils establishes contact by e-mail to their home and the school and have TV conferences through Skype with the third graders 3. During the summer vacation, pupils take home tablet PC and WiRT to work on a music project through the vacation	1. Each time at image transmission, IP must be reset on the tablet PC (Remedied in Sep) 2. Free version of Skype is capable of only one-on-one connections, to establish multiple class contact, a TV system with multiple contact capability is required.



3. Special support school

Current status of Use of Tablet PC and IWB	Issues & Point to Remember
Teachers and ICT engineers cooperated and produced teaching devices such as an interactive digital picture book, "Big Turnip" (Japanese language: home-visit program), as well as the "sound-wave shape software" which displays the loudness of human voice in visualized wave form (Science: junior high) ・For severely handicapped pupils who cannot handle the pen for handwriting for the tablet PC, the staff developed a handwriting device by pasting conductive tape on a ping pong ball	・Because tablet PC consumes a large amount of current, the batteries must be recharged often ・The access speed of the Wi-Fi LAN is very slow and freezes in the midst of regeneration of moving images from time to time. The operating speed of the LAN as a whole must be increased

(Primary School Section)
Teacher develop curriculums which pipils are interested in. Many seemed to prefer physically active programs **wherein they use their whole body**

(Junior High School Section)
During self-study period, individual pupil set up objectives relative to their study and daily living and regularly check their progress

(Home-Visit Program)
Enjoying the picture book using the ping pong ball with conductive tape as a switch. Many other digital learning materials are used in the classroom

3.4.5 Summary of Experimental Learning Sessions in Primary school

The number of sessions in which collaborative occurred increased overall. Concerning ICT-utilized learning, 70 to 90% of the students feel good about it in both the first and second year.

Teacher also giving a good response. The skills in leading the classroom in ICT-utilized learning is definitely improved. From the Figure 3.5, proportion of teacher who can lead class is displayed in pale gray(at start of ICT introduction under the project – around October 2010). The state at the beginning of early 2011(April-May 2011) in dark grey and the state at the end of 2011(around February 2012). The skills improves significantly after one year.

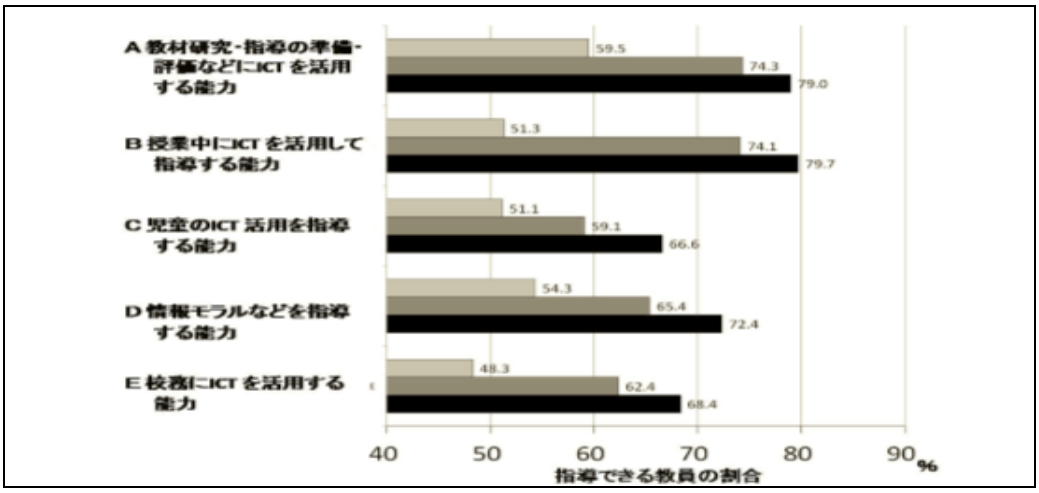


Figure 3.5 ICT Skill of Teacher

3.4.6 Summary of Experimental Learning Sessions in Junior High schools

More than 80% of the students responded positively in "interest in class, motivation to learn and classroom behaviour" and "improved teachers' environment" as shown in Figure 3.6 below;

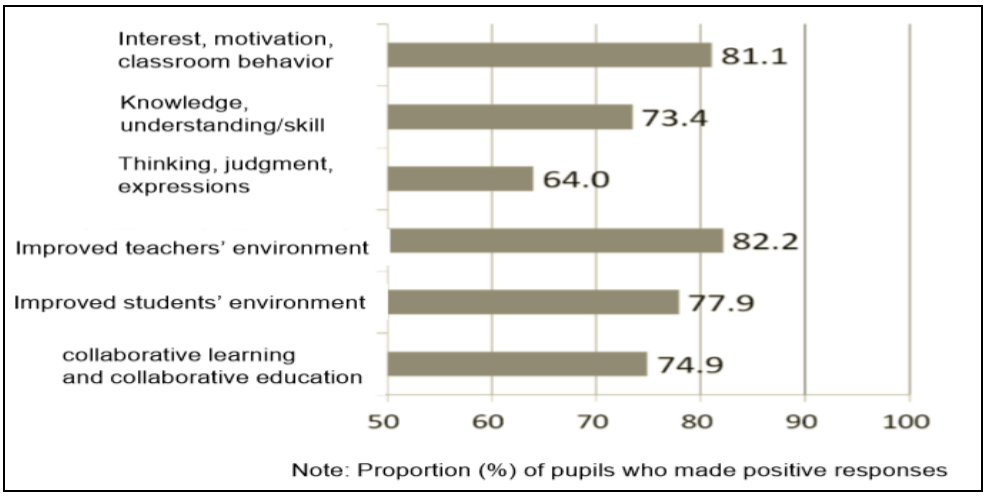


Figure 3.6 Student's Response for using ICT in classroom

Teacher felt that the teaching method become more stimulating and the system is good because it includes even handwriting. The parents were very surprise to see the children were so involved in learning. They believe if the ties within classmate are strengthened, the bully cases can be expected to decline.

CHAPTER 4

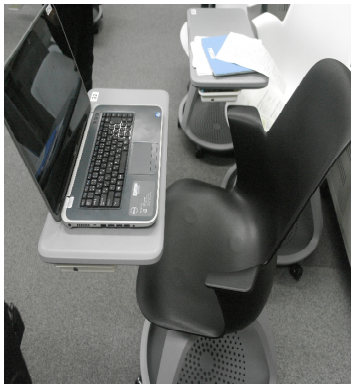
SCHOOL OBSERVATION IN CHIBA PREFECTURE

4.1 ICT in Chiba Prefectures' School

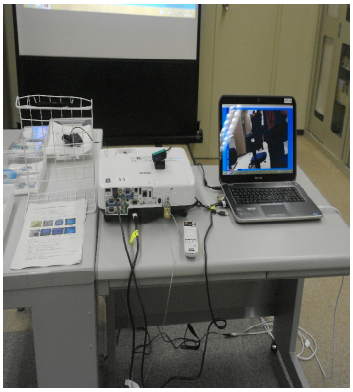
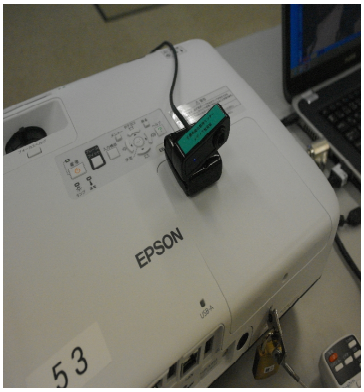
The Future School Promotion Project is a country project and it is only involve 20 schools until 2013. Every prefecture has their own budget for ICT infrastructure in school but it is limited. So, the prefectures have to find solution to create an ICT environment in the classroom and school

For Chiba Prefecture, the Teacher Training Center has proposed some equipment to create a Future Classroom utilizing ICT in school but still in research mode because of budget limitation. The planning is shown in the pictures below.

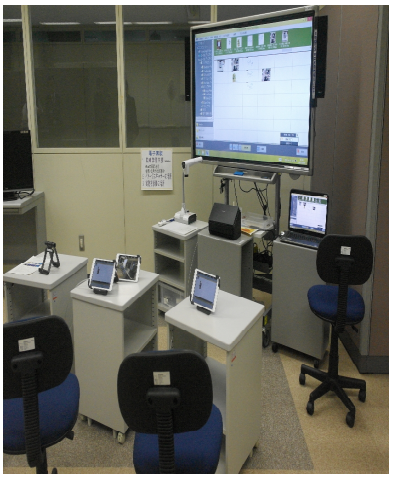




Every class can be equipped by laptop and electric board. The class also have special chair with can be rearrange depends on the subject or teacher.

They also promoting the use of electric board and camera in the classroom


The use of Ipad connected to electric board also has been revised by Chiba Teacher Training Centre to improve the utilization of ICT in the classroom.

4.2 School Observation 1

4.2.1 Details of the class

This observation was in in Houda Junior High School (法田中学校) in Funabashi. This is Grade 3 class for Music by Mr. Hama Yuki. The topic for that day was “Enjoy Japanese Traditional Music”. The class was using iPad, Head Projector and Electric Board for the lesson.It also have piano in front of the class. The instrument for that day was Koto. The instruments were already prepared by the teacher to be used by the students. One Koto will be shared by 2 or 3 students.

4.2.2 Lesson

The class started with a song by the students. One of the student played the piano and another one become the conductor in front of other students. They sang really well. The lesson for that day is how to play Sakura (Japanese folk song) using ‘Koto’, a traditional Japanese stringed musical instrument. Using the iPad which is connected to a electric board, teacher showed a video on how to play the instrument. Teacher also use the head projector to show the placement of the fingers when he play the instrument. He used both, head projector and iPad alternately to make sure the students understand and can see the instruction clearly.

After showing how to play the basic note for Koto, the teacher asked the student to try playing the Koto in group of 2 or 3. They also took a video using the iPad when they played the instrument. Teacher walked around the class to see how the students play the instrument. He also did some correction to a few students who did not play correctly.

As the conclusion, teacher showed some video of the students playing the Koto. They discussed the video and teacher gave his opinion based on the student's video.

4.2.3 Student's Attitude

The students followed teacher's instruction very well. They looked happy while trying the Koto and taking video while playing the instruments. They also managed to play the song well when they saw the instruction from teacher and video.

4.2.4 Benefit of using the ICT in classroom

Using the ICT in classroom can be very helpful for the teacher and students. Teacher can enlarge and highlight the important part and use video to attract student's interest.Fully utilizing the ICT can make the lesson more interactive and easy to understand through teaching and learning among the students themselves.

4.3 School Observation 2

4.3.1 Details of the class

This observation was in in Mama Elementary School (真間小学校) in Ichikawa for Social Studies class. The teacher for this class is Mr. Matsuda Yutaka and the topic for that day was "Mama River". The class was using Notebook, Electric board and Head Projector for the lesson. Same as other classroom in Japan, this class also have television and radio.The teacher prepared the connection of the notebook and the electric board.

4.3.2 Lesson

The teacher revised again what they discussed in previous class. The topic was about the river near to the school. The students were asked to create a slide using an application in

the electric board about the topic given. They also have to give some information about the river in the slide. The student has been given 20 minutes to prepare it in group of 2.

They can find information from the internet or books. They can go to the library or computer room to get the information. After that, they have to make the slide in the computer. The student was asked to give some explanation to their friends about their slide.

4.3.3 Student's Attitude

Students looked excited to do the task given to them. Some of them were very good using the search engine in the internet to find the information needed. They seemed to help each other using the computer. The teacher also helping them to do the slide.

4.3.4 Benefit of using ICT in the lesson

By finding the information, it makes the student compare and examine the information that they have obtained and what the others found out. It is also deepen their understanding through the effort to explain their own ideas and others in an easy to understand manners.

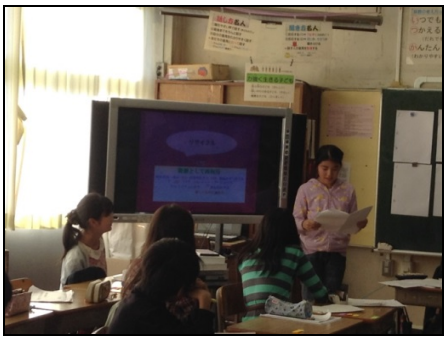
4.4 School Observation 3

4.4.1 Details of the class

This observation was also in Mama Elementary School (真間小学校) in Ichikawa for Japanese Language class by Mr. Norimoto Ryo. The topic for that day was “State One Opinion with Reason and Evidence using Panel Discussion”. The class was using Notebook and Electric board for the lesson. The arrangement in the classroom was changed. The class has been divided into 3 groups which was administrator, presenter and audience.

4.4.2 Lesson

The students have been divided into group. They have to prepare a powerpoint about some topic. Teacher had selected 6 best powerpoint to do the presentation on that day. Every group was given 5 minutes to do their presentation. Teacher became the advisor only. Everything was handled by the students. After each presentation, the audience was required to give their opinion about the presentation.

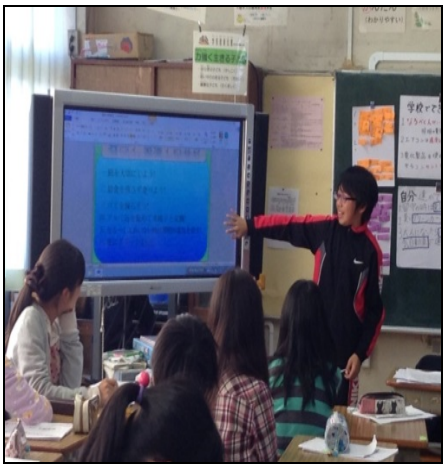





After all presentation, the administrator group will make a conclusion based on the discussion of the audience.

4.3.3 Student's Attitude

All of the groups have prepared a good presentation. The audience seemed to give their full attention to the presentation because they need to rate the presentation.



4.3.4 Benefit of using ICT in the presentation

The utilization of ICT can promote collaborative learning when they can learn and teach among themselves. It also can help the student to develop enough ability to think, making decision and expressing themselves while doing the presentation.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

The feedback received from students, teachers, open class participators and guardians about the Future School Promotion Project were very positive. Teacher's skill to lead the ICT classroom was increased even though the project just been started in operation.

In past, a teacher only teaching knowledge according to course of study in one way and using the same approach to everyone in the classroom. But now, the way of teaching and learning has been change. Based on the program and training provided, teacher has shifted their focus of teaching. It is more into assisting and stimulating learning to the students. ICT is becoming as effective tools to make the teaching and learning session become more interactive and easy to understand for teachers.

Today's classroom is filled with students who have plenty of distinct learning needs. Everyone have a different ability and preference in studying. It is the teacher's job to make sure that every student is given every possible chance to learn as much as they can no matter how advantages or disadvantages they bring with them. By utilizing ICT in learning, it can help to present content which can engage and facilitate student's expression.

From the observation, we can see how the teacher used ICT to reach their learning objective. In the music class, the teacher is using a head projector to show the movement of teacher's hand and showing the playback video was a good combination of explanation. They have face-to-face session to what is the teacher do and at the same time would be able to watch and listen to the playback the video whenever they need more practice.

The student stay connected to the lesson using the iPad was so interesting. After all the explanation and exercise given, the student was able to record and make video on how the play the musical instrument. The use of smarboard and iPad make the interaction between teacher and student was able from anywhere in the classroom.

ICT can help the student to express themselves. When the student was given a specific topic and need to present their ideas in effective and efficient way, they can be assisted by computers like in the Science class. It promotes collaborative knowledge creation and learning. The student try to understand the topic and at the same time helping to teach their friends about the same topic.

Effectiveness of computerization in the educational field has been globally proven. Classroom with ICT utilization can promote individualized learning considering student's abilities and collaborative learning where student can teach and learn among themselves. As one of the leading country in Internet connectivity and ICT infrastructure, Japan is ready to promote an advance utilization of ICT into the education especially schools.

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