Understanding Korean Education

Vol. 2 ICT in Korean Education
CONTENTS

Chapter 2  ICT in Korean Education

Preface
Korea has achieved remarkable economic development from the 1960s- known as the "Miracle on the Han River"- through the implementation of growth-oriented economic policy. As illustrated by the 2006 World Bank statistics which showed Korea's GDP to be the 13th largest in the world, the growth has been spectacular.

With few natural resources at its disposal, Korea's achievement in joining the ranks of the high-tech nations of the 21st Century was due to its human resources. The driving force behind the astounding growth of Korea is education.

For this reason, many nations have taken an active interest in sharing in Korea's experience in educational development, resulting in many foreign nationals visiting Korea for this purpose with demand for study tours to Korea's education-related organizations growing every year. The experience of Korea's education that has played an integral part in the nation's rapid economic progress has indeed become a benchmark for many developing nations.

To satisfy this demand, the Korean Education Development Institute(KEDI) has, with the backing of the Ministry of Education and Human Resources Development, published the series "Understanding Korean Education". This series of volumes was published to effectively provide visiting education policy advisors, educations experts, and other education professionals interested in gaining an understanding of Korean education, with a summary and information on the process of Korean educational development.

This series consists of 5 volumes. The first volume is 'School Curriculum in Korea' and presents current school curriculum in
Korea, the development process of national curriculum, and the process of textbook certification.

The second volume is entitled 'ICT in Korean Education'. It describes important aspects of ICT in Korean education and discusses further development of ICT in Korean education.

The third volume entitled 'School Education in Korea', deals with childhood education, primary and secondary education, teacher policy, special education.

The fourth volume, 'Higher Education and Lifelong Learning in Korea', deals with reform in Korean higher education, and lifelong learning systems such as air and correspondence high schools and the academic credit bank system. In addition, it covers social capital and HRD, which are currently prominent issues internationally.

Finally the fifth volume, 'Education and Korea's Development', examines the role education has played in the economic development of Korea. Volumes 3 to 5 consist of literature used for study tours and international seminars that have been edited for the purposes of this series.

As far as possible, I hope this series can go some way into aiding foreign nationals seeking understanding of Korean education. My thanks go to the authors and members of the International Cooperation Team at KEDI, whom in the process of planning, editing and publishing this series, have spared no effort.

Hyung Yeel Koh
President
Korean Educational Development Institute
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Chapter 1

Recent Advances of Korean Education with ICT

Award from UN for infotech

Korea has seen spectacular economic development in the past 50 years and education was one of the most important elements which made it possible. Considering Korea’s many limitations such as poor natural resources, relatively small land, and total destruction during the Korean War, the role of education for Korean economic development is more meaningful still. Figure 1 shows the current general status of Korean Education.

Recently, scholars and administrators in the developing countries have taken a keen interest in Korean education especially with the advanced implementation of ICT in education. For example, according to OECD (2005), Korean students’ self-efficacy for ICT use in learning (71.1%) was higher than the OECD average member economies (64.2%) in primary and secondary education. Also, Korea was ranked second to Finland in the area of using ICT for students’ systemic learning in primary and secondary education (OECD PISA, 2003). There is a similar trend in Korean higher education.
Figure 2 describes the current status of ICT in Korean education. Korea has shown spectacular economic development in the past 50 years and education was one of the most important elements which made it possible.

Figure 3 shows the relationship between ‘Korean Economic Development’ and the major three elements of ICT in education. This form of utilization of advanced information technologies in the education sector was significantly acknowledged not only by underdeveloped countries but also by international organizations such as OECD, APEC and the United Nations. In November 2007, Korea received an award for achievements with information communication technology (ICT) from the United Nations’ education and scientific body.
Box 1. Korea Receives U.N. Award for Infotech

Korea’s use of advanced information technologies in the education sector was awarded a prize by the United Nations’ education and scientific body. Education Vice Minister Lee Jong-seo accepted the award at UNESCO headquarters on behalf of the Ministry of Education and the Korea Education Research Information Service. The UNESCO King BinIsa Al-Khalifa Prize was launched in 2005, although this was the first time that the $50,000 prize was awarded.

Korea and Finland each received $25,000. UNESCO highlighted Korea’s best practices in using information and communications technologies, particularly its cyber home learning system for primary and secondary students. Finland was awarded for its e-Degree program.

"Many children around the world still live in places that do not have internet connections. We will not take the prize for granted but take on the duty to become a leader in introducing information technologies to those countries," Lee said in his acceptance speech.

UNESCO officials said that Korea’s cyber home learning system is an innovative national model for collaborative educational planning by governmental agencies, legislative bodies, educational institutions and communities, promoting the use of ICT at schools and homes.

The award, which is funded by Bahrain, aims to enhance ICT learning, teaching and overall educational practices.

By Cho, Ji-hyun (sharon@heraldm.com)
(Korea Herald, Monday, November 26, 2007)
Korean Future Schools with ICT and Community

"Koreans look very dynamic!" This was a view many of my overseas friends expressed to me after watching on television the 2002 World Cup held in Korea. This may or may not be the case. The following article can help give an insight into the nature and tendency of current Koreans with regard to ICT.

In Korea, there are several schools which can be identified as models for the future: Daeshin Elementary School, Shinhak Elementary School, Haegang High School, and Yangun Elementary School. These four schools can be categorized into two varieties: one is focused on the advanced utilization of ICT as ubiquitous technology and the other is focused on using advanced ICT within the teacher-learner-parents community. Daeshin Elementary School, Shinhak Elementary School, and Haegang High School are of the...
first variety. Yangun Elementary School is of the second. The following is an examination of the basic components of both varieties.

Figure 3. The key elements of Korean economic development and ICT (Kim, 2007a)
Box 2. The on Crowd

Koreans are a contradictory bunch. On the one hand, they are the passionate people whose craze World Cup fans made headlines around the world. But meet them face to face, and they can be timid. Some say Koreans are naturally dynamic, but that this disposition has been tempered by Confucian traditions that placed central importance on being gentle and considerate. Thus, so the theory goes, Koreans have become rather passive and uncomfortable in the company of strangers.

It should come as little surprise, then, that the internet has had such a seismic impact on Korea. In a country where social mores have often made it tricky to meet people from outside the group, the internet offers a ready-made forum to teach a vast number of kindred spirits. And of the myriad sites spawned to get "netizens" closer together, none has had quite the impact of online "cafes" or clubs.

The statistics speak for themselves. Homegrown portal site "Daum" (http://daum.net) says it has around 7 million online communities, with another 4,000 or so opening every day. A staggering 23 million Koreans, or a little under half the population, belong to one online Daum club or another, making it the biggest such portal in the country. And when you consider that many of these people will belong to several clubs at the same time, the true number of members stands much higher.

(Morning Calm, December 2007, pp. 60-61).
Daeshin Elementary School

*What is a U-school?* This next-generation school combines ubiquitous computing technology with a school management and learning environment that are safe, convenient, comfortable, healthy, and exciting. Busan Metropolitan City Office of Education and KT Inc. are forging the vision and propagating the concept of U-schools to prepare for the next-generation educational system based on the advent of a ubiquitous society.

Daeshin Elementary School opened the U-school system on May 31, 2006. The following article is an account of the characteristics of the U-school.

![Picture 1. Opening of Daeshin U-School.](http://Korea.net)
Box 3. U-school Paves Way for Educational Innovation

As soon as students arrive at school, they put their student identification card on an electronic class board to register their attendance. Then, a parent receives a text message saying "Your child has just arrived at school at 8:35 a.m.," through their mobile phone every morning. On the electronic message board, students' attendances are being checked and shown, along with the daily class schedules.

Not only student attendances but also other notices about homework and school materials are able to fall into the hands of parents through what is being termed "Ubiquitous Learning School" (U-school). Under the so-called future-oriented educational infrastructure of "U-school," teachers give lectures to students by just clicking on electronic boards instead of writing on blackboards with a piece of chalk. And such a school is not just fantasy, it is here and now.

The Busan Metropolitan City Office of Education launched the u-school in association with KT, the nation's largest fixed-line and broadband service provider, at Daesin Elementary School in the southern port city of Busan on May 2 on a two-year trial basis. It is the first time in Korea for Internet-based, high-tech educational infrastructures to be operated all around a school.

"There are many schools adopting U-learning techniques initiated by the government. But this is the first time to introduce the Internet-based high-tech devices as an educational infrastructure to manage the whole educational system at school," Koh Yi-gi, a researcher with the Busan Education Research and Information Center, told Korea.net.

At the so-called "U-Daesin Elementary School," digital computer boards are installed in seven places such as arts and multimedia classrooms and the library, showing various materials carrying

(continued)
educational content. Students can conduct various experiments through the computer boards and immediately confirm the results. "It is very interesting to see what is wrong and right about a given question immediately through the computer board. It will be fun to study through the smart boards," Kim, an 11-year-old girl, said.

In addition to educational content, student health conditions are being checked and handled under the electronic system. Children are encouraged to exercise in accordance with their electronically measured health condition. A mobile class is also available for students in another class. If students take part in a field trip, other students in another class at the school can access the field trip content without going outside. The school is equipped with closed circuit television (CCTV) in 16 places vulnerable to juvenile delinquency. The school's administration office can watch what is going on through round-the-clock CCTV and control possible crimes.

"The concept of the U-school is different from the government-initiated U-learning or e-learning in many ways. The U-school means broader concepts by being equipped with digital-based infrastructures at schools as well as just teaching methods," Koh said.

"The U-school is offering a more comprehensive all-around educational environment including monitoring students' health conditions and crimes to provide more convenient educational atmospheres for students unlike the current U-learning which just indicates teaching and studying methods," Koh said.

He added the U-school will be operated for two years based on 11 items to measure the most educational and cost effective system to expand the program to other schools. "The school is expected to raise educational effects and turn the school into a safe zone in which students can study and play through the electronic devices connecting parents to school," Kim Chul-soo, the school's principal, said. However, the U-school has a long way to go due to high operation costs. About
1.1 billion won has been spent setting up the system. Additionally, information usage fees are expected to cost hundreds of won per month.

"The U-school is offering a more comprehensive all-around educational environment including monitoring students' health conditions and crimes to provide more convenient educational atmospheres for students unlike the current u-learning which just indicates teaching and studying methods," Koh said.

The Ministry of Education and Human Resources Development is trying to bring Internet-based and U-learning education within reach of primary and secondary schools. The ministry last year designated about 18 elementary, middle and high schools nationally as pilot u-learning project schools. IT-related corporations will provide the technological infrastructure, including 100 personal computers, 350 PDAs and 20 server systems valued at 1.3 billion won for homes and schools. The chosen 18 schools will operate two systems; wireless learning and Internet-based learning. Seven high schools will use PDAs as replacement tools for private tutoring and two elementary and middle schools will use PCs to test mobility, portability and adaptability to individual needs of the U-learning sector.

In the Internet-based sector, nine elementary and middle schools will implement cyber home schooling, connecting school education to home studies. The ministry also operates cyber home schooling on websites in 16 cities and provincial education offices nationwide. Under the government project, about 4,183 primary and middle school students have used 241 cyber classes for after school study since 2004.

Sinhak Elementary School

Sinhak Elementary School in Seoul has been designated as a research school for u-learning\(^1\) by Korean MOE&HRD from 2005 to February, 2008.

With ubiquitous school facilities and curriculum related to ICT use in education, the school has strengthened cyber education. For example, it provides education through the utilization of the school’s homepage and its cyber-school server. In this aspect, the school encourages pupils to acquire various ICT related certificates during their school years. In addition, various competitions are held to assess the capability of their cyber utilization and computer application.

Sinhak’s computer education focuses on developing abilities that help students manage redundant information and share key information with others for their benefit, especially in learning. Therefore, the students take computer classes in 2 computer rooms in this school once a week no matter what grade they are in. They can also take advantage of learning materials from internet. Many materials and links are easily accessible on Sinhak’s homepage (http://www.seoulsinhak.es.kr).

Since Seoul Sinhak Elementary School was designated as a research school in the area of U-learning in March 2005, the school has aimed to explore the effectiveness of U-computing technology application in elementary school learning. This research program was carried out under the title "AA System of Tablet PC." To conduct this project, U-learning environments for the pupils were set up. First, the school constructed U-learning hardware like Tablet PCs, electronic boards, individual headsets, and digital cameras. Each student in the U-learning class was given their own

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1) Ubiquitous Learning
Tablet PC, so they could use them at home as well as in the classroom while studying. Moreover, many kinds of software have been installed. Using One Note 2000, students can write on the computer screen with electronic pens and record their voices. As key software in U-learning, the internet portal server plays an important role.

Now, most students actively upload their opinions on the school homepage. In addition, many different kinds of lectures are available at the Cyber school on Sinhak’s homepage. Also, through the development of a digital textbook by Korean MOE&HRD, the
U-learning class has been utilized more, using the materials in the main class since 2006.

Picture 2. Teaching class using ICT in Sinhak Elementary School (http://www.seoulsinhak.es.kr)
Haegang High School

Haegang High School was designed as a U-school (ubiquitous-based future school) to create a better future for the Korean youth, to realize their dreams come true, and to give them greater worth and satisfaction. It was hoped that Haegang High School would be a front-runner in the 21st century education of the future, as well as offering a safer, user-friendly, and more comfortable education environment.

The Haegang U-School system is composed principally of the six modules (USN, U-Library, u-learning system, U-Health Care System, Integrated Management System and School Violence Prevention System). To support this system, the U-School
Management System is connected to the Busan Department of Education Office, local hospital and police station. The system within the school comprises the Faculty Management System, RFID Equipment Management System, Wireless Internet System, Multimedia Lecture System, Internet Broadcasting System, U-learning System for Teaching and Learning, U-Health Care, U-Library, U-School PR Room and Electronic Bulletin Board. The following table describes the objectives and details of the six major modules of the Haegang U-High School system.

<table>
<thead>
<tr>
<th>Module</th>
<th>Objective</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>USN</td>
<td>Offering a dreamy education environment based on USNs such as the RFID (Rapid Frequency Identification), signal recognition tag, VoIP (Voice-over IP) and high-speed mobile internet.</td>
<td>VoIP system, key phone, wireless internet AP, Active RFID reader, students’ ID card authorization, high-speed mobile internet</td>
</tr>
<tr>
<td>U-library</td>
<td>Providing highly convenient school libraries, equipped with an automatic unmanned loan/return system and a loss prevention system based on RFID technology lending system, general stock taker, reader for the librarian, overall view of library.</td>
<td>Internet search table, loss prevention gate, automatic unmanned book loan/return system</td>
</tr>
<tr>
<td>U-learning System</td>
<td>Offering an education environment with constantly accessible wired/wireless internet and UMPC. The multimedia lecture system such as electronic teaching desks/blackboards etc., will provide the pleasure of learning to students.</td>
<td>UM(UltraMobile) PC, lecturer tracking camera, electronic blackboard and teaching desk, lockers, electric motor curtains</td>
</tr>
<tr>
<td>System</td>
<td>Description</td>
<td>Equipment/Features</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>U-Health Care System</strong></td>
<td>Individual health information of students is monitored. Body fat analyzer used to help prevent students from becoming obese and acquiring diseases.</td>
<td>school infirmary, health care system</td>
</tr>
<tr>
<td><strong>Integrated Management System</strong></td>
<td>Every school-based system, such as the U-health-care system, classroom bulletin boards, digital broadcasting system, equipment management system, penalty management system, and bulletin information and attendance system, methodically administered through an integrated platform.</td>
<td>electronic bulletin boards, machinery resources, management system, classroom bulletin boards, U-school integrated platform, attendance checking system</td>
</tr>
<tr>
<td><strong>School Violence Prevention System</strong></td>
<td>Prevention of School violence and accidents through installation of infrared CCTVs and an emergency call system in blind spots on the school premises. Dangerous situations can be dealt with effectively.</td>
<td>united management system (teachers’ room), duty room, united management system (principal’s office), emergency pager, infrared CCTV, monitoring system</td>
</tr>
<tr>
<td><strong>Integrated Facilities Control System</strong></td>
<td>Real-time online monitoring of important equipment and facilities on the school campus, such as the water tank, electric room, boiler, drainage pump, air conditioners, and machinery room. Potential disasters can be averted.</td>
<td>KT integrated control room, machinery room, boiler, air conditioner, electric power control system, drainage pump</td>
</tr>
</tbody>
</table>
Yangun Elementary School

As an information-oriented school for future education, Yangun Elementary School is one of the successful cases which are focused on using advanced ICT within the teacher-learner-parents community. Since appointed a model school for information-oriented education by Busan Metropolitan City in 2000, the school was awarded superior school status for accomplishments in education programs successfully by the Superintendent of Educational affairs.

Picture 3. Consulting with the faculty of Yangun Elementary School for Future Education

Besides the school facilities in u-Learning environment equipped with the recent IT technologysuch as electronic information system, RFID system for tracking students’ attendance and welfare
information, the following programs provided in the School describe the features for the future education using ICT in education.

First, teachers in Yangun Elementary School encourage the students to do self-directed study by using of its interactive school homepage. The homepage of Yangun Elementary School gives easy access to school resources for students, teachers and parents. Using this, students review, discuss and share their knowledge or experience and execute self assessment through use of online discussion.

Second, this school tries to strengthen the community with students, teachers, and parents through online activities. For example, the students in the school participate in weekend project classes and its individual progress is updated to the school homepage. Then, parents and teachers check the homepage to assist or evaluate the programs done by students by use of interactive tools in the homepage. Therefore the online space through the school homepage provides various sections for community activities and information exchange not only for students but also for teachers and parents.
Chapter 2

Development of ICT in Education

Process of ICT development in Korean education

Two different approaches can be taken for ICT development in Korean education: one is a procedural approach and the other is a more holistic one encompassing continuous causal relationships (with many sets of causes and results). The procedural approach is often seen as appropriate for clear initial understanding. However, for deeper understanding and inquiry, the latter approach is considerably more helpful in many cases. In this chapter, we will examine both approaches in detail.

The ‘Initial Infra Stage’, the Comprehensive Plan for Education in the Information Age (CPEIA), was initiated in 1997. It aimed at building the basic infrastructure for education in the information age by constructing computer labs and distributing personal computers to all teachers in schools with computer networks at primary, middle, and high schools.

The first phase of the educational ICT infrastructure plan was completed earlier than scheduled, and a Comprehensive Plan for the Two-Phase Education Information System was established in 2001 as a five-year plan. It aimed at providing one personal computer for every five students with an internet connection speed of at least 2 Mbps.
The Promotion of Korean MOE & HRD

Since 2001, the Korean government has changed the paradigm of national growth from implementing human resource policies unilaterally, to a process whereby the government develops and implements them systematically through inter-ministerial consultations. As a consequence, the Ministry of Education was promoted to a deputy prime minister-level office, and renamed the Ministry of Education and Human Resources Development (MOE & HRD) on January 29, 2001. The following Table 3 shows the difference between the two entities (MOE & HRD, 2007).
The next Figure 7 explains the process of widening the scope of nation-wide human resource development policy implementation with the key role of the MOE & HRD. In between the two master plans of HRD, the Education Innovation Council was established under the direct guidance of the President. The Council consults the President regarding strategies and policies for education and human resource development geared towards producing the human talent required in the knowledge-information society of the 21st century (MOE & HRD, 2006).

Table 2. History of Korean ICT Education Development (Kim, 2007b)

<table>
<thead>
<tr>
<th>Years</th>
<th>Key issues and activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997-2000</td>
<td>&quot;Comprehensive Plan for Education in the Information Age&quot;: National masterplan for &quot;the most wired nation in the world.&quot; It was the cornerstone of current e-learning. Internet access and computers for every classroom with 1st ICT training for all teachers Establishing Cyber universities</td>
</tr>
<tr>
<td>2001-2004</td>
<td>Focused on integrated use of ICT in curriculum with the Comprehensive plan for Teaching and Learning Center and the Comprehensive Plan for Library at the state, local and school level. Information distribution and sharing for the best practices 2nd ICT training for teachers Master plan for reducing private tutoring with Educational Broadcasting System (EBS)</td>
</tr>
<tr>
<td>2005-current</td>
<td>Focusing on more systematic change in school education with e-Learning and u-Learning Self-directed learning</td>
</tr>
</tbody>
</table>
The following is an examination of the key aspects of the causal approach for understanding Korean ICT development.

First, who was the stakeholder of the CPEIA? The stakeholder of the CPEIA was the Korean Ministry of Education (MOE), supported by and/or in association with other ministries such as Ministry of Information, Ministry of Science and Technology, Ministry of Labor, Ministry of Industry and Resources. The plan brought about a total national systematic change with regard to information technology and was not limited to the education sector. The majority of the time there was cooperation between ministers, but on occasion they competed in taking the leadership in using ICT for human resources development in many different areas.

<table>
<thead>
<tr>
<th>MOE</th>
<th>MOE &amp; HRD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head: Minister</td>
<td>Head: Deputy Prime Minister</td>
</tr>
<tr>
<td>Focused on the</td>
<td>Focused on a broader range of policies involving the supply, demand,</td>
</tr>
<tr>
<td>supply side of</td>
<td>management of human resources.</td>
</tr>
<tr>
<td>human resources,</td>
<td>Need to consider on a national scale policy such as a support system,</td>
</tr>
<tr>
<td>such as primary,</td>
<td>including a mid- to long-term human resources development vision,</td>
</tr>
<tr>
<td>secondary,</td>
<td>implementation strategies, and an organization to coordinate human</td>
</tr>
<tr>
<td>higher and</td>
<td>resources development policies, as well as related laws.</td>
</tr>
<tr>
<td>life-long</td>
<td></td>
</tr>
<tr>
<td>education.</td>
<td></td>
</tr>
</tbody>
</table>
Second, why was the CPEIA implemented in 1997 Korea, at that time, was in the middle of the financial crisis that was sweeping through Asia, and needed to find an alternative economic paradigm to the "Industrial Paradigm." ICT was seen as an excellent alternative for Korea at that time and the paradigm of the "Knowledge-based society" was adopted. As better infrastructure and human resources were needed to adopt the new paradigm in Korea, the CPEIA could become the key to achieving this.

Another aspect of ICT development in education was the speed with which it was adopted and implemented. Even considering the fact that ministers and the central government had led ICT innovation proactively, the development was remarkably rapid and
From around 1995, there was already a high degree of social consensus about the use of ICT in education due in large part to the cooperation of the big three Korean newspapers with regard to government policy. From 1995, these newspapers (Chosun, Joongang, and Donga) started a nationwide campaign to expand ICT in education. More specifically, each newspaper selected one level of education (Chosun-elementary, Joongang-middle, and Donga-higher) and vigorously promoted the importance of using ICT at each level. Of course, they had an ulterior goal of acquiring efficient.
early access to the digital news market. Perhaps not surprisingly, two major public television stations (KBS\(^3\) and MBC\(^4\)) joined them in this activity and many different NGOs including academic associations also ran together with the press. It was an effective coordinated effort between government, the press, and NGOs with academic associations such as KSET\(^5\) and KAEIM\(^6\) and Technology. It also brought about opportunities for hardware and software companies which had already made significant investments in information technology.

In 1997, the CPEIA could be launched with maximum emotional and financial support. Mainly, the plan was aimed at building the infrastructure for education in the information age. To enable teachers to take advantage of ICT and improve their instructional methods, personal computers were distributed to teachers in schools with computer networks at elementary, middle, and high schools. This scheme was also designed to enable students to learn computing for one hour per week and for teachers to utilize ICT for at least 10 percent of their teaching.

In 2001, a comprehensive five-year plan for the Two-Phase Education Information System was established to further advance the education information infrastructure. This shifted the focus from the infrastructure to actual performance. Some of the intended objectives of this plan included upgrading of the education information infrastructure to cope with rapid changes in ICT, developing an education information infrastructure to the level of advanced OECD countries, and establishing a system for optimum operation of that infrastructure (MOE & HRD, 2007).

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3) Korean Broadcasting System  
4) Munhwa Broadcasting System  
5) Korean Society for Educational Technology  
6) Korean Association for Educational Information
As of December 2003, the number of PC’s available at schools stood at 1,351,000, or one PC per 5.8 students. By the end of 2003, each school had one or two computer labs depending on the size of the school. At that time, about 66.8% of all schools were connected to 2 Mbps internet lines. The other purpose of this plan was to facilitate the use of e-learning in class for the improvement of creativity and problem-solving abilities. Meanwhile, in February 2004, there was a significant milestone in that EBS commenced the online College Scholastic Ability Test (CSAT) lectures as part of the effort to alleviate the financial burden of private tutoring. In order to provide public access for the EBS service, upgraded PCs and

<table>
<thead>
<tr>
<th>Target</th>
<th>Project</th>
<th>Performance</th>
<th>Investment (won)</th>
</tr>
</thead>
<tbody>
<tr>
<td>School (10,046 schools)</td>
<td>Computer lab</td>
<td>431,918 PCs established</td>
<td>440.8 billion</td>
</tr>
<tr>
<td></td>
<td>Computer network</td>
<td>10,046 schools networked</td>
<td>259.8 billion</td>
</tr>
<tr>
<td></td>
<td>Five-year free internet service access (2000-2004)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom (214,000 rooms)</td>
<td>State-of-the-art Teaching equipment</td>
<td>115,987 PCs</td>
<td>600.8 billion</td>
</tr>
<tr>
<td></td>
<td>Video system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher (340,000 persons)</td>
<td>1 PC per person</td>
<td>340,854 PCs</td>
<td>251.5 billion</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>888,822 PCs</td>
<td>1,552.9 billion</td>
</tr>
</tbody>
</table>

As of December 2003, the number of PC’s available at schools stood at 1,351,000, or one PC per 5.8 students. By the end of 2003, each school had one or two computer labs depending on the size of the school. At that time, about 66.8% of all schools were connected to 2 Mbps internet lines. The other purpose of this plan was to facilitate the use of e-learning in class for the improvement of creativity and problem-solving abilities. Meanwhile, in February 2004, there was a significant milestone in that EBS commenced the online College Scholastic Ability Test (CSAT) lectures as part of the effort to alleviate the financial burden of private tutoring. In order to provide public access for the EBS service, upgraded PCs and
Development of ICT in Education

High speed internet connections (2-10 Mbps) were provided to all high schools across the nation. Other equipment such as conventional TVs, projection TV’s, LCD projectors, etc. were needed in order for high schools to make the best use of the EBS service. As of December 2004, all necessary equipment was provided to elementary, middle and high schools.

Role of ICT in Korean educational development

Since 1995, what was the main role of ICT for Korean educational development. Finding an answer to this question requires consideration of the characteristics of ICT. The key concept of ICT is "enhancing communication among people with divergent forms of information and advanced convenient technology" and this is the ultimate role of ICT in general education.

However, with regard to process in Korean education, ICT had different roles. In the early stage (1995-2000), ICT itself was a goal. In this period, ICT was a focal point which drew together a diverse range of resources such as the press, academic associations, governmental policies, industries, and public opinions. Since the goal was very clear for every Korean, it was relatively easy to create synergies in using ICT in education.

Table 5. Classroom Teaching Devices: Video Equipment
(MOE & HRD 2007).

<table>
<thead>
<tr>
<th>Equipments</th>
<th>TV</th>
<th>Projection TV</th>
<th>LCD Projector</th>
<th>Visual presenter</th>
<th>Scanner</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>numbers</td>
<td>31,091</td>
<td>238,615</td>
<td>29,925</td>
<td>78,886</td>
<td>9,247</td>
<td>82,886</td>
</tr>
</tbody>
</table>

National vocational high schools are not included.
In the subsequent stage (2001~2004), the role of ICT was evolved into means for gathering and distributing educational resources and implementations of best practices as well as volunteer in education. Volunteering is perhaps the most effective approach in alleviating economic disparity and the digital divide, now and into the future (Kim, 2005). In this period, ICT was instrumental in establishing many teachers’ on-line communities such as Indischool, Kyocom, EDUNET, and APEC Learning Community.

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7) http://www.indischool.com, middle and high school teachers’ on-line community
8) http://eduitka.org, elementary school teachers’ on-line community
Builders10) (Kim, Lee & Choi, 2006).

In the third stage (after 2005), the main role of ICT in Korean education was as a supporter for learning and voluntary participation especially at the individual level of which UCC(User Created Contents) was a good example. This stage also facilitated decentralization of educational policy through delegation of duties and responsibilities to local governments.

In 1997, The "National Cyber-University Competition" took place under the leadership of MOE&HRD, with nearly all Korean universities taking part as a member of a consortium and/or as an individual entry. Government pledged significant financial and administrative support for the top five cyber-universities in the competition, even if the promise was partially accomplished. The competition was a catalyst for the establishment of strong ICT infrastructure not only in universities and but also in life-long education systems in general.

**Master plan for alleviating private tutoring cost**

Now, we can ask the fourth question: "How can it be continued from 1997?" The answer lies in the "Master Plan for Alleviating Private Tutoring Cost" (MOE&HRD, 2004a). Any discussion on the factors that lead to Korean economic advancement cannot exclude Koreans’ historical and cultural passion for education. Many Korean parents saw it as a mission to invest heavily in a child’s education and this was manifested in numerous critical problems related to private tutoring costs. Measures needed to be taken to reduce these costs not only for sustainable economic development

9) http://edunet4u.net, government supported on-line community for teachers
but also to alleviate the social and educational disparity between rich and poor, which had widened owing to the considerable expense of private tutoring. This tendency presented a good opportunity for EBS (Educational Broadcasting Service) which conceived the Master Plan for Alleviating Private Tutoring Cost.

*The plan initially brought about EBS Programs for College Scholastic Ability Test (CSAT), and drove more fundamental measures, which represented by E-Learning master Plan for Elementary-Secondary Education.*

(MOE& HRD, 2004b) (Jun & Kim, 2005, p. 26)

Further discussion is needed to enlighten the general process of ICT development in Korean education especially focused on a more causal relationship. History is a process of challenge and a response.
Chapter 3

Key Elements of Korean ICT Education

University e-learning supporting centers

In 2002, the MOE & HRD launched the "Comprehensive University Informatization Plan (e-Campus Vision 2007)" (MOE& HRD, 2002). The "e-Campus Vision 2007" had five goals: 1) Promotion of informatization of education, academic, and research areas, 2) Implementation of transparent and productive university administration services, 3) Enhancement of ICT utilizing competency within the higher education community, 4) Reinforcement of cyberspace security and upgrading of IT infrastructure and related laws, and 5) Provision of social services through informatization in Korea and beyond.

To ensure the success of the e-Campus Vision 2007, one university per designated province was selected through competition as a central supporting center. These centers, named University e-Learning Supporting Centers (ULSC), were equipped with advanced e-learning infrastructure including studio classroom facilities as well as highly sophisticated teaching/learning-support systems. The centers promote joint development and shared utilization of e-learning contents and/or e-learning systems as well as educational exchange between local universities. They are also
responsible for the operation of regional e-learning consortia with local e-learning related institutions to provide educational services to the local community. Table 6 shows the budget for ULSCs.

Table 6. Budget Plan for University e-Learning Support Center Project (MOE&HRD, 2006)

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>New ULSCs</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Budget (US$M)</td>
<td>0.91</td>
<td>0.90</td>
<td>2.38</td>
<td>2.38</td>
<td>3.13</td>
<td>9.70</td>
</tr>
</tbody>
</table>

In 2003, the first ULSC was created at Cheju National University. In the first five years up to the completion of the project in 2007, a total of 10 ULSCs were sequentially opened in each province (See Table 7). Through the establishment of these centers, the gaps in the quality of education between different regions have been minimized. Also, since each center had an individual area of specialty according to the strength and vision of the region it serviced, it was possible to forge an effective win-win relationship between the centers, local government and central government.

2003 saw the establishment, at Gyeongin National University of Education, of an additional university supporting center for the 11 national universities of education, called the University of Education Cyber Education and Training Support Center (UE-CETSC). The national universities of education are unique in that their sole purpose is the training of prospective elementary school teachers. The UE-CETSC supports teacher training through e-Learning.
Table 7. University e-Learning Support Centers (ULSC) in Provincial regions

<table>
<thead>
<tr>
<th>Region of ULSC (CenterUniv.)</th>
<th>Specialties</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Jeju (Cheju Nat’l Univ.)</td>
<td>Free International City &amp; Tourism</td>
<td>2003</td>
</tr>
<tr>
<td>2) Busan/Ulsan/Gyeongnam</td>
<td>Industry-Academia e-clusters.</td>
<td>2004</td>
</tr>
<tr>
<td>(Gyeongsang Nat’l Univ.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) Daegu/Gyeongbuk (YeungnamUniv.)</td>
<td>Korean languages courses</td>
<td>2005</td>
</tr>
<tr>
<td>4) Gangwon (Kangwon Nat’l Univ.)</td>
<td>Training of Military personnel</td>
<td>2005</td>
</tr>
<tr>
<td>5) Gwangju/Jeonnam (ChonnamNat’l Univ.)</td>
<td>Global CEO in Asia</td>
<td>2005</td>
</tr>
<tr>
<td>6) Chungbuk (Cheongju Univ.)</td>
<td>Support of multicultural homes</td>
<td>2006</td>
</tr>
<tr>
<td>7) Jeonbuk (Chonbuk National Univ.)</td>
<td>Oriental Medicine/Medical Res.</td>
<td>2006</td>
</tr>
<tr>
<td>8) Incheon/Gyeonggi (Inha Univ.)</td>
<td>Support of NT/BT/IT/Logistics</td>
<td>2007</td>
</tr>
<tr>
<td>9) Daegu/Chungnam (Chungnam Nat’l Univ.)</td>
<td>Lifelong Education</td>
<td>2007</td>
</tr>
<tr>
<td>10) Seoul (Hanyang Univ.)</td>
<td>Creative Engineers</td>
<td>2007</td>
</tr>
</tbody>
</table>

**EDUNET**

EDUNET (http://www.edunet4u.net) an online education center managed by the Korea Education and Research Information Service (KERIS, http://www.keris.or.kr), was the first Korean comprehensive educational information service and was launched in 1996 to operate the cyber learning system. The scope and content of EDUNET are shown in Figure 10 and 11.
According to the MOE & HRD, 100% of all teachers and 35% of all students had subscribed to EDUNET as of 2005. This center provides ICT-based teaching and learning materials such as electronic textbooks and tests for each subject from elementary to secondary level. The intention was to encourage self-directed cyber learning to reduce private tutoring expenses and strengthen public education (Chang, 2005).

Figure 9. EDUNET as a National Teaching Learning Center
(MOE & HRD, 2007)
The NEIS (National Education Information System) was established in November 2002 to improve efficiency, transparency and convenience in education administration and to provide citizens with high quality educational services.

NEIS integrates the entire body of information related to the administration of primary/secondary schools by the metropolitan/provincial offices of education, for the creation of a comprehensive education administration information system that digitally integrates and processes the areas of academics, personnel, budget,
and accounting. Park (2007) describes the main characteristics of NEIS as follows:

![NEIS Service Connection](image)

**Figure 11. NEIS Service Connection (MOE&HRD, 2007)**

The NEIS is a nationwide education information system for constructing a computerized environment which over 10,000 primary and secondary schools, 16 metropolitan and provincial offices of education and their subsidiary institutions, the Ministry of Education and Human Resource Development is linked through the internet to share education-related information. A program for managing students’ records on their health status, schoolwork and grades (previously managed by each school) used integrated
method through the internet, it was constructed at the cost of 52.1 billion won in 2002. After NEIS was implemented, students do not have to go to their school to have a school record or graduation certificate issued, and parents can check on their child’s attendance and academic record directly through the internet. In addition, the system enables the schools to share student data easily if a student transfers to another school or progresses to an upper-level school.

It also simplified tasks related to entrance exams for college/university through convenient provision of entrance-exam screening data such as high school GPA and school activities record (Park, 2007).

Figure 12. History of NEIS Development (Park, 2007)

Although initially opposed by teachers’ unions due to security concerns, the system was eventually accepted by the majority of
teachers. The following article from The Korea Herald describes the major arguments from some teachers that protested the introduction of NEIS.

This is not to say that NEIS should provide as much information about students and teachers as it was intended to when the construction of the computer network started two years ago. Instead, such vital information as records on medical treatment can be withheld because it is assumed that unauthorized access to it may constitute a grave threat to privacy.

The unionized teachers are opposed to sharing not only personal medical information, but also two other categories of information, namely academic affairs and school administration for one, and admission to and graduation from schools for the other. They are demanding these categories of information be stored in separate school computer networks, 97 percent of which NEIS has already replaced.

Inefficiency and inconvenience are not the only problems of going back to the old school networks. A greater problem is the cost of building the networks anew and their firewalls, which are needed to ensure a similar level of security NEIS provides against hacking. Cost estimates range from 800 billion won to 2 trillion won.

For the reasons mentioned above, non-unionized teachers and education officials, who constitute the majority of the education faculty, demand NEIS be kept in operation, with personal medical information excluded from its service. Otherwise, they say they will go on a strike themselves.

A new round of negotiations will have to start soon if the ministry is to keep school administration from being paralyzed. In this regard, the education minister is advised to resign, not because he is vetoed by those in favor of NEIS, but because he has squandered the moral authority that is needed to reconcile the two
Initially, the KTU (Korea Teachers’ Union) seemed to have public support on this issue. However, the support began to wane over time as the public and non-unionized teachers became increasingly impatient with the meaningless arguments raised by the KTU, whose actions had become markedly more aggressive and violent. The following article clearly explains the conclusion on NEIS. This would be an excellent example of "innovation and diffusion of ICT" in education.

As of 2007, all 10,940 schools, 182 local education offices, 16 provincial offices and the MOE & HRD are inter-connected via NEIS. The NEIS enables real-time data/information exchange
between education authorities and schools on matters such as general school affairs, academic management and auditing.

Table 8. NEIS Academic Administration System Application

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary Schools</td>
<td>Academic affairs/admissions, and healthcare for elementary schools</td>
<td>3,211</td>
</tr>
<tr>
<td>(Academic Affairs, Admissions, Health)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary Schools</td>
<td>Academic affairs/admissions, and healthcare for middle schools</td>
<td>5,012</td>
</tr>
<tr>
<td>(Academic Affairs, Admissions, Health)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary Schools</td>
<td>Academic affairs/admissions, and healthcare for high schools</td>
<td>5,276</td>
</tr>
<tr>
<td>(Academic Affairs, Admissions, Health)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary Schools</td>
<td>Academic affairs/admissions, and healthcare for special schools</td>
<td>3,799</td>
</tr>
<tr>
<td>(Academic Affairs, Admissions, Health)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary Schools</td>
<td>Academic affairs/admissions, and healthcare for generals</td>
<td>119</td>
</tr>
<tr>
<td>(Academic Affairs, Admissions, Health)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>System, General</td>
<td>System administration, log-in, others</td>
<td>2,896</td>
</tr>
<tr>
<td>Others</td>
<td>Common modules, others</td>
<td>3,358</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>23,671</td>
</tr>
</tbody>
</table>

*Sources: Korea Education & Research Information Service, August 2006*

Teacher ICT training

The following Figure 14 shows the trend in teacher participation in ICT training from 1988 to 2004. Before 2000, teacher training programs could be divided into 2 types. The first was in the form of a general course for teachers focused on imparting understanding of computers and improving computer skills. The other was a special course that aimed to cultivate school professionals with expertise in creating educational content, teacher training lecturers and school commissioners responsible for
computer education in each school.

In 2001, a new training program for teachers was announced by the MOE & HRD. The program was based on increased student activity and teacher participation, with a curriculum more integrated with ICT as the following figure shows.

Figure 13. Percentage of Teachers Taking ICT Training Programs (MOE & HRD, 2005)

The teacher training for education information led by the Korean government since 2001 has targeted 33% of teachers every year and has obtained meaningful achievements in recognizing teachers’ roles in the knowledge-based society and in improvements in teaching methods through ICT utilization.
Cyber Home Learning System (CHLS)

The Cyber Home Learning System (CHLS) is an internet-based learning support service whereby users can learn subjects of their choice adjusted to their level. After being administered a level-test and learning-style examination, students are allocated to a class and cyber home learning teacher, and learn individualized content. Diverse additional services such as study counseling, life counseling, level-testing via a test questionnaire database and instruction of community activities are also offered.

With the objectives of strengthening public education, reducing the scale of private education and narrowing regional and social class differentials, e-Learning implemented in CHLS can be an important method in realizing a lifelong education system geared towards an improved quality of life. For the initial stage of CHLS,
Jang (2007) described as follows:

The Cyber Home Learning System (CHLS), based on ICT education in elementary and middle schools, is being employed with the purpose of improving the quality of public education and reducing private education expenses.

Since the first pilot project was launched in the 2nd semester of 2004 by three Metropolitan and Provincial Offices of Education in Daegu, Gwangju, and Gyeongsangbuk-do, Korea, CHLS has been implemented nationwide in 2005. Nine months, more than one million members are participating in CHLS across the country. CHLS offers a range of services, including free self-learning content provision, online testing, teacher interaction, and learning activities. To determine whether CHLS adopted nationally had met its
original objectives of an improvement in the quality of public education and reduction of private learning expenses, Jang (2007) conducted a research survey of 19,567 students, 1,531 teachers, 5,345 parents, and 468 education officials working for the five Metropolitan and Provincial Offices of Education in Busan, Gangwon-do, Gyeongsangbuk-do, Chungcheongnam-do, and Jeollanam-do. The main results of the research can be summarized as follows:

First, the results of student surveys suggested that satisfaction with and effectiveness of the CHLS are highest in elementary schools, followed by middle schools, and were lowest in high schools.

Second, students from high income families and those living in metropolitan areas showed greater satisfaction and better achievements with CHLS. Since residents in small towns and villages did not have as much access to private education as those in metropolitan areas, they had relatively higher expectations for CHLS - a factor that may explain lower satisfaction with CHLS in these areas. Also, it was difficult for low income families to secure and maintain decent computers, which may explain the survey results which showed lower effectiveness of CHLS for this group.

Third, the greater the number of semesters for which students made use of the system, the higher the indicated satisfaction.

Fourth, the success of CHLS was also dependent on students’ academic performance and their aptitude for self-initiated learning. That is, learners who consistently achieved higher grades showed higher satisfaction with CHLS and also tended to have their own method for studying.

Fifth, learners who had the motivation to study were more likely to progress easily through self-initiated study and were sure to feel more satisfaction with the system. This highlights the need to improve recognition of CHLS among students and parents to
induce voluntary participation. Consistent publicity on the effectiveness of CHLS is also necessary.

Sixth, in organizing classes for CHLS, elementary students showed greater satisfaction when cyber classes were created according to their conventional (off-line) school classes, while middle and high school students expressed preference for being assigned to groups based on regions.

Seventh, CHLS was more effective in replacing private education in low income families, regardless of their residential area. This result shows that the major factor affecting propensity for private education was family income, rather than residential area. It also indicated that low income families were more likely to use CHLS as a substitute for private education. Therefore, it is necessary to expand the service and support low income families with materials to utilize CHLS (Jang, 2007).

The Cyber Home Learning System of Korea is an e-Learning system planned and operated by the MOE & HRD, and 16 Metropolitan & Provincial Offices of Education since 2004. It can be categorized as the first case in the world to adapt in K-12 area national scale which basis for SCORM 2004.

KERIS has developed and modified SCORM 2004-based Content Packaging Tool, Conformance Test Suite and LCMS (Learning Contents Management System) for adaptation to CHLS. KERIS has also provided technical support to 16 Metropolitan & Provincial Offices of Education through open source principles. Standardization specifications that apply to CHLS are as follows (Cho, 2006):

- SCORM 2004 Content Packaging Spec
- SCORM 2004 Data Model and API/API Adaptor
- SCORM 2004 Sequencing & Navigation Rule
- KEM (Korea Educational Metadata for K-12)
More detailed information pertaining to the above can be found on the video file on this website.
(http://adlcommunity.net/mod/resource/view.php?id=548)

**Evaluation of adapting ICT in education**

There were increasing demands for conducting objective evaluation of adapting ICT in education and developing the indices to analyze the results of investment. In this regard, the MOE & HRD and KERIS developed the indices for primary/middle school levels in 2001, high school level in 2002, lifelong educational informatization in 2003, and special schools in 2004.

Using the indices developed above, the evaluation of adapting ICT in education has been conducted, on a sample that represented one third of the total number of primary and middle schools, every year since 2003. Additionally, the evaluations for special schools and classes were made in 2005. Of note, in 2006, a nationwide evaluation of adapting ICT in education was conducted targeting every primary and middle school, a total of 10,889 schools.
Table 9. Development of Indices for Evaluation of Adapting ICT in Education

<table>
<thead>
<tr>
<th>Items</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policies</td>
<td>Development of indices for objective evaluation of adapting ICT in education.</td>
</tr>
<tr>
<td></td>
<td>Operation of evaluation system with focus on utilization and performance of adapting ICT in education.</td>
</tr>
<tr>
<td></td>
<td>Trend analyses based on evaluation results and comparisons with other countries.</td>
</tr>
<tr>
<td>History</td>
<td>2001: Development of indices for adapting ICT in education in elementary and secondary schools (two types for elementary and secondary schools respectively)</td>
</tr>
<tr>
<td></td>
<td>2002: Development of indices for adapting ICT in education in colleges and universities.</td>
</tr>
<tr>
<td></td>
<td>2004: Development of indices for adapting ICT in education in special schools (two types for special schools and special classes).</td>
</tr>
<tr>
<td>Evaluation</td>
<td>2003: 2,297 elementary and secondary schools (about 30%, random sampling)</td>
</tr>
<tr>
<td></td>
<td>2004: 2,197 elementary and secondary schools (about 30%, random sampling)</td>
</tr>
<tr>
<td></td>
<td>2005: 2,259 elementary and secondary schools (except those evaluated in 2003 and 2004), 115 special schools (all), 706 schools with special classes</td>
</tr>
<tr>
<td></td>
<td>2006: 10,889 elementary and secondary schools (all)</td>
</tr>
</tbody>
</table>

**Digital Library System**

Digital Library System (DLS) is a multi-functional information center based on current, conventional library facilities combined with an audio-visual classroom for accessing visual materials and an electronic information classroom for searching internet information and accessing electronic information sources. With DLS, the school library provides a virtual learning community environment whereby learners and teachers can search for and read school library data both on and offline and use them in the learning and teaching process.
DLS is expected to contribute to increasing school library use, encouraging reading among students, and improving students’ ability to write essay and to utilize information in their study. And as of 2005, Korean MOE & HRD shows the statistic data on the use of DLS and it indicates 65% of schools and 63% of teachers expressed satisfaction with the system.

**EBS**

The Educational Broadcasting System (EBS) is a broadcasting network that provides free public educational/instructional programs supported by MOE & HRD. Anyone can receive free
EBS CSAT (College SAT) broadcasting service via the internet and it is also possible to utilize the diverse and abundant EBS content in classrooms without constraints of time and space. Experts in each subject provide tailored lectures according to age, region, and media by analyzing the time and scope. Expanded e-learning content support is providing additional services such as sign language for the disabled.

With its successful operation since 2004, with over 230,000 users in the whole country as of 2006 since 2004, EBS has contributed to enhancing educational welfare in Korea by not only reducing

Table 10. Functions of DLS

<table>
<thead>
<tr>
<th>Functions</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automating school libraries</td>
<td>· Circulating books for school libraries</td>
</tr>
<tr>
<td></td>
<td>· Reporting statistical data related to school library operation</td>
</tr>
<tr>
<td></td>
<td>· Supporting school library activities through online DLS</td>
</tr>
<tr>
<td></td>
<td>· homepage</td>
</tr>
<tr>
<td>Collecting and sharing database</td>
<td>· Building database for the bibliographies of school libraries</td>
</tr>
<tr>
<td></td>
<td>· Searching library data through internet</td>
</tr>
<tr>
<td></td>
<td>· Using digital reading materials such as e-book</td>
</tr>
<tr>
<td>Reading education</td>
<td>· Recommending book lists for each subject</td>
</tr>
<tr>
<td></td>
<td>· Providing online space for students’ activities after reading</td>
</tr>
<tr>
<td></td>
<td>· Supporting teaching and learning activities for teachers</td>
</tr>
<tr>
<td>Etc.</td>
<td>· Communicating between managers and users through internet</td>
</tr>
<tr>
<td></td>
<td>· Educating how to use school libraries for creative self-directed learning</td>
</tr>
<tr>
<td></td>
<td>· Connecting to various education information in related organizations</td>
</tr>
</tbody>
</table>
private tutoring but also broadening educational opportunities to children in low-income families. In addition, it has made generally known to the public of the new learning system using ‘e-Learning’ based on the world’s best IT technologies to the public.

Through the two channels (EBS Plus 1 and EBSi), EBS provided 5,169 programs in 2004, 7,426 programs in 2005 and the numbers of programs are also increasing reflecting its outcomes and number of users.
Educational Management Information System (EMIS)

The Korean MOE has collected annual statistical data on education since 1962. Of course, in the early years, the whole process of data collection and analysis was primitive by modern standards and every April this data was shared with major educational stakeholders through the ‘Statistical Yearbook of Education.’ Times have certainly changed since then. In 1997 the establishment of the Educational Management Information System (EMIS), an ICT-based system for educational information management, precipitated great change in this area.

EMIS is a Korean information processing system for educational system management. The processing includes provision of educational information about the current status and predictable future of education. Consequently, an educational stakeholder can resolve a pending problem, return to the status-quo, and induce development toward the desirable future for education. EMIS comprises the Educational Statistics System (ESS) and the National
Education Information System (NEIS).

Park(2007) clearly explains the four major functions of EMIS in the following Table 11.

ESS content was expanded to cover more policy-relevant surveys such as the KEDI Educational Longitudinal Survey (KELS) and Survey of Lifelong Education. These sample surveys can provide detailed, pertinent information on how education is processed for the individual student at each school level- something that administrative data collection cannot provide. KELS covers a wide range of educational process variables with student achievement scores and started with a cohort of lower secondary school students in 2005. The Survey of Lifelong Education is a survey targeted at households and which involved asking household members about their education history in the past year. Through these expansions of content, KEDI has tried to overcome the shortcomings of administrative data collection and has supported policy-based approaches to the educational statistics program.

Table 11. Four Functions of EMIS

<table>
<thead>
<tr>
<th>Functions</th>
<th>Descriptions</th>
</tr>
</thead>
</table>
| 1. Providing information for operating current affairs | • Generally descriptive data information  
• Providing administrators with the most accurate and up-to-date information of the current situation  
• Assisting decision-making at the operational level of daily work |
| 2. Providing information for educational policy making | • Educational decision making is a decision making process of the educational policy.  
• Providing the policy makers with the most credible information related to the policy issues |
| 3. Providing information for educational research | · Inevitable elements for the scientific research on educational phenomena which is to understand and theorize the behavior patterns of educational system  
· Developmental stage of disciplinary research is the indicator of the stage of the society, so is the stage of information and statistical data processing system |
| 4. Providing information for producing social indicators | · Indicator is the composite information by translating the complex phenomena of the current society by using the basic statistical data, such as a per capita GDP or price index  
· Educational indicator such as the class size, teacher-student ratio or unit cost of education reflect the quality level of educational system as well as the level of educational invest of the country |
Chapter 4

Korean ICT for International Educational Cooperation

Korean e-Learning (KOeL)

KOEL, as an innovative education brand of Korean MOE&HRD, symbolizes the leading education of Korea and represents generally the best practices for e-Learning and education information.

Following the vision of KOeL to create a clean and green education environment, blue was selected as the main colour to express a future-oriented and reliable image. Through italic font expresses both a modern and dynamic image. And the red ‘@’ sign is used to depict cyber-space, e-Learning and advanced educational systems.

Figure 19. Logo of KOeL
**Global partnership for ICT in education projects**

To bridge the digital divide between countries and share knowledge and experiences in education information using e-Learning, Korea Education & Research Information Service (KERIS) started the project ‘Global Partnership for ICT in Education’ with support from Korean MOE&HRD and other related organizations.

![Figure 20. Beneficiary Countries in Global Partnership for ICT in Education Project (MOE & HRD, 2007)](image)
In this project, the main activities can be categorized into the following two themes. First, for 5 years since 2003, over 12,000 refurbished PCs have been donated to partner countries that were in need of them. Second, to enhance the effect of using ICT in education, teachers and educational administrators were invited to training programs in education with 1,332 participants from 16 countries in 2007.

Table 12. Progress of Global Partnership for ICT in Education Project (MOE & HRD, 2007)

<table>
<thead>
<tr>
<th>Year</th>
<th>PC donation</th>
<th>No. of countries</th>
<th>Teacher training</th>
<th>No. of countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>149</td>
<td>2</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>2004</td>
<td>556</td>
<td>5</td>
<td>160</td>
<td>2</td>
</tr>
<tr>
<td>2005</td>
<td>3,755</td>
<td>14</td>
<td>349</td>
<td>13</td>
</tr>
<tr>
<td>2006</td>
<td>4,227</td>
<td>18</td>
<td>455</td>
<td>17</td>
</tr>
<tr>
<td>2007</td>
<td>3,530</td>
<td>15</td>
<td>357</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>12,217</td>
<td>-</td>
<td>1,332</td>
<td>-</td>
</tr>
</tbody>
</table>

**APEC Learning Community Builders (ALCoB)** 11)

Recently, together with the rapid globalization in the education field, technology-based international networking is generating various online learning communities of teachers and students of various cultural backgrounds. Online learning communities are made up of individuals who constantly interact online based on common interests and goals (Armstrong & Hagel, 1997).

One of the most prominent online communities in the education

11) This is a summary of a paper by Kim et al. (2006)
field is teachers’ communities that partake in cooperative activities as a means to improve their professionalism. Scales of community management vary, ranging from a community of 10 members to one of more than 100,000 members. Despite a high level of concern of some community members, not all of the communities are successful. Some are thriving with the encouragement of many teachers. Others have little backing of teachers even if they are well organized. Why is this?

Many top-down communities are not successful because online communities require each member’s affirmative participation and volunteering depending on his or her interests. This is also shown in ‘the case study of online-based teachers’ communities (Jung et al, 2004: Shin, 2005).’ This study reports that online learning communities with members’ spontaneous support are successful while those under government control are not.

In this context, ALCoB online learning community which had the claims "APEC Learning Community for Shared Prosperity; ALCom" received much attention. ALCom’s main members are teachers and students within the APEC region. Educators, scholars and entrepreneurs are actively involved in the support of ALCoB. That currently has a membership of around 14,000.

ALCom (APEC Learning Community for Shared Prosperity) was a nonprofit subordinate project of the APEC international cooperative educational projects supported by the Korean MOE&HRD and Institute of APEC Collaborative Education(IACE). With 120,000 visitors to its homepage every year, and 15,000 materials posted on its bulletin boards, ALCom is a successful online community. It raises the question of how ALCom was able to achieve success despite being run by government officials.
Figure 21. Structure of ALCoB

Figure 22. ALCoB Gateway for APEC Learning Community Builders and APEC Future Education Consortium (http://alcob.com)
The Key to Success of ALCoB Online Learning Community

Thanks to widespread internet availability and various contents being available online, many activities and clubs have proliferated in online learning communities. Online learning communities have merits that attract many people who want to safety particular needs, such as for communicating with each other and forging friendships across borders and time zones, sharing information, and so on (Seo, 2002). A systematic combination of successful factors has ensured the successful management of these online learning communities.

A notable example is a teachers’ community managed by a government-affiliated organization. 81.6% of teachers make use of this community through which they download studying materials, but efficiency is very low at 4.0% (Jung et al., 2004). On the other hand, communities managed through the support of teachers typically have membership of 20,000~80,000. They are successfully operated through members’ active feedback (Shin, 2005). The difference between the two communities is the fact that the former is government-run and the latter is run by teachers.

Another learning community was notable in that it was initiated by the government but was managed through the vigorous support of teachers. ALCom is an international online learning community that covers 15 economies and 1,400 teachers, students and supporters in the APEC region. Achievements of ALCom have been cited at major APEC events.
How could a government-led community be successful? Figallo (1998) pointed to ‘focus’, ‘interaction’ and ‘cohesion’ as the keys to success. Shin (2005) identified the following key factors for success: 1) obvious objectives, 2) positive exchange of information between members, 3) volunteer members willing to upload contents of high quality, 4) active online events such as on-site gatherings and 5) well-made homepage meeting the needs of the community’s goal.

Shin’s theory as it relates to ALCoB warrants close examination. First, ALCoB has a clear objective in that it aims to narrow the digital divide through interaction of teachers and students in APEC economies. Of course, this was originated from Korean government but all members of ALCoB have agreed to this idea and participated in volunteering jobs. Second, ALCoB actively promotes exchange between operators and members. Operators
facilitate communication lines with members through email, homepage activities, telephone calls, regular newsletters, discussions, etc. Active exchanges are ALCoB cooperative projects, AIV (ALCoB Internet Volunteers), and online/on-site information exchange. Third with regard to active participation of this online learning community, education officials (delegates from the education ministries of each APEC economy), have played important roles as ALCoB supporters. They are encouraging their economy’s ALCoB to participate in the community activities.

Forth, regarding onsite events such as biannual workshops, annual international conferences and project team gatherings, these onsite events provide members, who mainly interact online, an opportunity to have a deeper understanding of their fellow community members, and this leads to expansion of online activities.

Fifth, regarding maintenance of a well-make homepage, the ALCoB website (www.alcob.com) is an easy-to-use web service system which is updated frequently through contributions made by various members. Many professors of education engineering and experts in international educational cooperation joined as members from the outset.

In addition to these key factors, an operator supports all activities and web workrooms and provides minimum expenses (for web-construction and basic activities) for online and on-site activities without any incentives going to members. The system is remarkable in that it is rooted in the spirit of spontaneity and volunteering. This spirit originated from ALCoB cooperative projects, AIV activities and international exchange performances.

Based on various factors of online learning communities, we examined some of the features of ALCom and the key to its success. Although ALCoB community was born through government’s initiation, the process of operation is much like that
of communities generated through volunteering supports.

**APEC Future Education Forum** ([http://www.alcob/forum](http://www.alcob/forum))

APEC Future Education Forum (AFEF) aims at crystallizing the vision of future education and realizing ideal the model of future schools from a wide spectrum of viewpoints on future society and education among APEC member economies’ prominent scholars, experts, education administrators, teachers and businessmen. To share and disseminate the high-valued academic outcomes at this annual meeting, the results are distributed through the publication of the ‘APEC Future Education Report’. Therefore, APEC Future Education Report is a kind of blue print for philosophy, vision, and practical strategies for APEC future education through a gathering of various view viewpoints and strategies on future education and sharing the outcomes with member economies.

To implement the notions and ideas from AFEF, the APEC ICT Model School Network was started as one of its project activities. In the APEC ICT Model School Network based on schools in the APEC region, the participating teachers and students aim to search and realize ideal future school model and foster understanding on the various education systems, culture, and history of member economies. In this respect, the activities in the APEC ICT Model School Network has the following three main objectives.

First, the identification of a future school model by surveying present condition of the best ICT model schools and organizing interchanges and collaborative researches in the APEC region.

Second, it is for inspiring APEC next generations with the understanding cultural, linguistic and historical distinction of APEC member economies.

Third, construction of a hub to share the best practices of
educational applications used in classrooms in order to narrow the digital divide within APEC member economies.

With these objectives, over 35,000 participants from 97 schools in APEC member economies are implementing cooperative multinational network projects such as online joint classes, online contests.

Inheriting the continuous efforts for finding the future education model, the 3rd APEC Future Education Forum was held between September 6-7 in Busan, Korea. The theme of the 3rd Forum, attended by around 300 scholars, ALCoB members, and others, was to design the Edutainment Park for APEC Future Education. This event was correlated with the 5th International ALCoB Conference as the APEC Education Festival Week. The general discussion session presented an opportunity for all participants to share their ideas on the Edutainment Park. In particular, the Consortium plans to convene the APEC Youth Forum in September as a forum for ALCoB learners to voice their ideas on
the youth and future of APEC.

**APEC e-Learning Training Program (AeLT)**

![Picture 4. 3rd APEC Future Education Forum in 2007, Korea](image)

The main goal of the APEC e-Learning Training Program is to narrow the digital divide and to enhance the quality of education in the APEC region. The efforts of participating member economies, supporting economies, faculty members and most importantly, trainees’ enthusiastically participating to the program will be a major contribution in realizing the following objectives:

First, the program is devoted to providing the customized e-Learning training program based on needs-analysis, reflecting current trends and recent technological developments in the e-Learning field.

Second, the program includes the dissemination academic achievements on e-Learning practices, policies and research findings through online and offline publications.

Third, the program strives to promote international cooperation by sharing cultural experience with the APEC member economies to build a human network. In the long run, this program will
strengthen international cooperation and contribute to building shared prosperity in the APEC region.

Community, e-Learning Solution Case Study, Collaborative Study, and workshop & team presentation. Field trips to ubiquitous-schools, ubiquitous cities, other educational offices and cultural experiences are also included on the on-site course. Post training course includes dissemination of research findings, submission of Post-Reports and participation in international education cooperation activities such as ALCoB (APEC Learning Community Builders).

On this effectively blended curriculum consisting of self-paced e-Learning, on-site education, field trip, classroom training, and manager feedback, participants have shown increasingly positive feedback. In particular, participants considered the collaborative study and field experiences to be the most useful parts of the curriculum since these classes provided a guide as to how to construct outlines of effective education process using ICT in their actual work places. Also it is remarkable that this program was selected as the top-quality project evaluated by Korean MOE & HRD in 2006, and appreciated by the participating economies with great interests and support, in particular, the Ministry of Education in China and Philippines.

With regard to its outcomes and feedbacks, it can be roughly divided into two as follows: strong human networks among alumni and outstanding results of Collaborative and Individual Study.

First, the alumni connected with each other voluntarily through online and offline channels to share findings, expedite international cooperation, and interacted with each other by participating in international education cooperation activities such as ALCoB (APEC Learning Community Builders) as follow-up. For example, participants from several economies have already established online or offline communities to promote continuous interaction, such as, International Conference & Workshop "e-Learning
Figure 26. Curriculum of APEC e-Learning Training Program (Lee, 2007)

Strategies: Edutainment" by Thai, Chilean and Indonesian participants.

Second, the theme of Collaborative Study is mainly about elevating education quality using e-Learning technology in university level or even higher level. Main objectives of Individual Study are finding effective ways of teaching in class using ICT. Collaborative Study and Individual Study were implemented in the 1st and 2nd rounds with great supports.
**ALCoB Edutainment Exchange Program (AEEP)**

Inheriting the accomplishments of APEC Future Education Forum to crystallize ideal vision of future education, ALCoB Edutainment Exchange Program (AEEP) aims at providing a future educational model combined with recent technologies like ubiquitous and experiential learning for cultivating the next generation leaders as a step toward the ALCoB Edutainment Park (hereafter, ET Park) System.

Regarding the notion of the ET Park, it is a real park and a social capital network system with u-Learning and experiential learning including physical and mental activities. ET Park will be harmonized with high technologies and environment, exciting playing and learning through communication and participation, and a community of students, parents and teachers with major principles. This is shown in Future 28 below.

As the first step toward realizing ET Park for future education, AEEP was launched with ALCoB community members and it plans to implement pilot programs in with Thailand and Vietnam in 2008.

Differing from current international exchange programs for students, AEEP, as a futuristic education model based on international cooperation, AEEP will be featured with a very unique curriculum including online and offline activities concurrently to provide a systematic educational program. Complementing the current school systems to cultivate the whole person based on teaching and learning ‘knowledge,’ and ‘human values,’ AEEP will offer meaningful chances to strengthen competitiveness of education to meet the challenges of globalization and market-opening of educational service.

More detailed components of AEEP can be described as follows: first, it is a supporting system for foreign/domestic student
exchange. Second, it is exploring programs with online and offline activities with home stay. Third, it encourages participation in volunteering activities and cooperation. Fourth, this exchange program intends to high quality education oriented exploring program at low cost. Therefore, in the long term, AEEP can be a formal curriculum in education system.

The following figure 29 shows the main activities featured with AEEP.

As shown above, the participants take pre-online training for better understanding of foreign history, culture, languages, etc. and also carry out team-based project activities online and offline concurrently. In addition, to strengthen knowledge and information and educate human values, the participants go through experiential learning in the exchange program with
activities such as home-stay, joint class, volunteering work, field trips to educational institute, cultural places and so on. By providing this long-term systemic educational curriculum, this Program intends not to be just a short-term international exchange of students but to make long-lasting cooperative relationship for the students, teachers and related participants based on the power of community. So, one round of AEEP will be implemented for 1 year at least and the community and project activities will be continued to share the results and improve its activities for sustainable development.
Chapter 5

Future Issues for the Sustainable Development of Korean Education with e-Learning

There are many issues that are tied to the future of Korean education especially with regard to e-Learning and/or ICT. Kim (2007b) summarized the factors for the sustainable development of the Korean education system with e-Learning as follows:

First, to determinate the future direction of education, suggestions as to practical activities for public education is needed as follows: first, it is undesirable to suggest future education based on one paradigm, methodology, or philosophy. Multiple paradigms and methodologies need to be considered in presenting suggestions for future education.

In particular, it is problematic that some see the future based on assertions made by western scholars, even though they insist that society has transformed into a knowledge-based society that utilizes e-Learning or u-Learning that uses cutting-edge technology methodologically and which is based on postmodernist philosophy. A true vision of future education requires departure from a focus on a single perspective.

The fact that current education is centered on the issues of economic dominance and that some people is aggravating such a
situation needs to be brought to attention. This is all the more evident in the fact that the four main areas of activity of CERI (Center Educational Research and Innovation), a component of OECD are innovation and knowledge management, learning and education, human resources and social capital, and focusing on the future. It is undoubtedly true that human resource development is important for sustainable economic growth in the information-based, future society, but this is not the only critical issue. In addition to economical implications, a comprehensive consideration of the psychological, social, and environmental changes that led to the ultra knowledge-based society and what effect these changes can have on populations is required. The outcome should bring economic development and enhanced social welfare. Furthermore, Banathy emphasizes that leadership that encompasses all that has been mentioned above should come from education as stated in the following:

"Education should not only reflect, interpret the society, but should also form a society by evolutionary interactions as a future-creating, innovative, and open system (Banathy, 1991, p. 129). Education should encompass all human beings and social existence including sociocultural, ethical, moral, economic/vocational, physical/cognitive, political, scientific/technological, and aesthetic sphere. (Banathy, 1991, p.130)"

Future leaders and pioneers are being nurtured at standardized educational institutions from elementary school to university. Thus education based solely on serving the needs of the economy should come to an end, as relics of a past industrial society. Focusing too much attention exclusively on communication ability, problem-solving ability, creativity, and the ability to find and discover information will only serve as a temporary solution to
achieving sustainable economic growth (OECD, 2004) even in the course of progressing into a knowledge-based society (Banathy, 1991, p.15).

The vision and method for future education can be prepared first by encompassing all aspects such as various paradigms and philosophies across various academic and societal realms through education. In addition, research into future education should be carried out using various methods, and as investigation into the future is a quantitative prediction, research tools such as surveys should be used. It should also be conducted with the objective of viewing the future as a whole, or to suggest a desirable future model by clearly defining concepts, and to expand common understanding. "Future campaigns" will help to set these objectives into action in diverse forms. This refers to the pursuit of practical action with the goal of forging a better future.

The second task for future education is consideration of the ways in which harmonious co-existence with other nations can be accomplished. Examples include engaging in voluntary activities at home and abroad. In particular, it is important for advanced Western countries, including OECD members, to consider the position of under-developed members when researching education for the future, and international agencies other than the OECD should engage much more in active international research and development on future education.

In particular, there must be international research that includes both advanced and developing economies and also international cooperative activities that put such research into action. Furthermore, the digital and knowledge divide must be resolved. It is desirable for such activities to be conducted within a space of grand discourse rather than through joint-research in a few fields of education such as is the case for OECD. In this respect, it seems necessary to promote continuously projects implemented by the
The new "well-being" trend is so familiar to us in everyday life. Few would say that the pursuit of a "well-being" lifestyle was immoral or socially harmful, but attention should be paid to a possible overemphasis on the "here-and-now" and not enough emphasis on the future. This toxic individualism occurs at the point where the paradigm "here-and-now" is not linked with the common consciousness. At this point, the positive "well-being" becomes the negative "Now-My house." This leads to a desire for organic foods, physical exercise, comfortable beds, and clean & hygienic private spaces. The problem lies in the fact that people take them for granted much of the time, with considerable energy and money being spent for possession of these "well-being" items. People become stressed as a result of the following situation: first, they get stressed because they are unable to enjoy the "well-being" life as much as what they feel they deserve. Second, the more "well-being" items they desire, the more hours they need to work to acquire these items. Emphasis should be placed not only on the concept of "well-being" but also on a healthy lifestyle (Some people call it "LOHAS: Lifestyles Of Health And Sustainability). We should enlighten the citizen after developing the concept and the system of "the healthy way of living."

It is high time that "the healthy way of living" movement got under way. In this context, volunteer work is one of the easiest ways of leading a "healthy life." Voluntary working includes sharing possessions deemed non-essential for the donor’s survival, and sharing and investing one's time for others. Einstein and Fromm had emphasized the importance of volunteer work as follows:
"I have now reached the point where I may indicate briefly what to me constitutes the essence of the crisis of our time. It concerns the relationship of the individual to society. The individual has become more conscious than ever of his dependence upon society. But he does not experience this dependence as a positive asset, as an organic tie, as a protective force, but rather as a threat to his natural rights, or even to his economic existence. Moreover, his position in society is such that the egotistical drives of his make-up are constantly being accentuated, while his social drives, which are by nature weaker, progressively deteriorate. All human beings, whatever their position in society, are suffering from this process of deterioration. Unknowingly prisoners of their own egotism, they feel insecure, lonely, and deprived of the naive, simple, and unsophisticated enjoyment of life (Erich Fromm, 1995, pp.233-234.)."

"Man can find meaning in life, short and perilous as it is, only through devoting himself to society (Einstein)."

Desire for volunteer work was almost the only positive result of the fulfillment of the basic requirements of survival of the human race. Fortunately, volunteer activities in various forms are flourishing around the globe. Greenpeace an organization which fights for the environment, Habitat where members are involved in building residential structures in developing countries at their own expense, Lions Club and Rotary Club that provide scholarships and self-development funds for students, and the Consortium for APEC Cyber Education Cooperation (ACEC: http://goacec.com) that dispatches ALCoB Internet Volunteers (AIV), are good examples. The meaning and spirit of such activities should be disseminated to elementary, middle, and high school students. Internet and cutting-edge information communications technology (ICT) will serve as important tools in vitalizing such volunteer
activities.

Third, although utilization of e-Learning and u-Learning via the internet is needed, this should be done in conjunction with face-to-face or personal activities. This is because the ego that has expanded in a certain area in the cyber space desires to check itself through actual activities. In addition, direct experience or reconciliation makes whole the indirect experience from cyberspace. Why else would people go to the zoo or to a safari park to see animals such as elephants, zebras, and lions that they have already seen through various multimedia, television, movies, and games? The fact that activities in cyber space are extended to face-to-face activities indicates that in the end, people are encouraged, inspired, and become accountable for their actions by meeting face-to-face for the activities in which they were engaged in cyber space.

Face-to-face activities overcome many shortcomings of the various forms of communications taking place in cyber space, maximizing merits, where participants are able to have personal experiences through visiting, touching, and feeling fellow participants. Future society should be structured so that personal experiences and conversations develop in parallel with cyber activities, with schools taking a leading role in setting this direction.

It seems that e-Learning will be one of the most viable alternatives for educational methods in the future. However e-Learning cannot constitute the entirety of education. Thus, educational methods that encompass aspects of anti- e-Learning and non- e-Learning must be settled. Anti- e-Learning is a movement that sets out to magnify the shortcomings of e-Learning, and which objects to its diffusion. The voices from this movement should be heard. The importance of considering the movement’s views lie not only in the fact that it pinpoints the major negative
aspects of e-Learning, but because its views and assertions are rarely heard despite their importance. Non-e-Learning refers to educational activities that are possible without the involvement of e-Learning and which were not included in the trend for e-Learning. For example, the importance of experiments in science education emerged in the early 1990s.

However, some teachers with computer expertise and school commissioners teamed up with scholars to assert that developing computer-based simulation experiment programs could replace actual experiments. They insisted that such programs, once set up, would enable students to conduct basic scientific experiments without the risk of handling dangerous chemicals (reagents) or conducting complicated experiments where equipment needed to be managed all the time.

Their opinions were accepted, and a large portion of the budget originally allocated for experiments was appropriated for CAI development. Appropriation of budget was necessary as there had never been a time when the budget was sufficient to fulfill the needs of all educational projects. However, unfortunately, a few years later, they could not prove the efficacy of the CAI program for simulations. It has now become necessary to invest in laboratories for actual experiments again. Such cases are not limited to experiments for science education. Due to past experience it is no wonder that recently blended learning method is once again gaining attention.

Fourth, nature-friendly schools or schools located within nature need to be built. This would enable students whose schools are located in downtown areas to take lessons in schools such as those described above. Of course, alternative schools can be supported through a system using mobile technology. For the time being, I will refer to such schools as "Edutainment Park (or EduPark)." EduPark is characterized by a joint community consisting of
parents, students, and teachers, state-of-the-art technology, natural environment, e-Learning, physical activities, fun games and learning, conversation and participation.

As the utilization of the Internet or information communications developed exponentially, EduPark should be established on an international scale so that the positive effects of such facilities, such as the provision of personal experience activities and the imparting of cultural understanding, can be enjoyed by anyone at minimum expense. International agencies should provide support for the operation of an international-level EduPark. Support can be offered in many ways, but most importantly the existence of a sound support organization is needed to discover and nurture the potential of members of individual countries as well as international communities. ALCoB (APEC Learning Community Builders; http://alcob.com), where teachers, professors, education administrators, and experts from 12 member economies have constructed a learning community and are actively engaging in activities, is a good example.

Fifth, school education should return to a more human-centered and value-centered education. It is important to have school curriculums that strengthen human resources for economic development. However, schools should also provide education on an alternative paradigm that can improve the endless consumption-centered lifestyle that leads to environmental degradation, destruction of human nature, and deprivation of freedom, self-concentration, and independence. Through emphasis of ethical and moral education, learners can escape from excessive desire for consumption and pursue a higher quality of living. Research is needed into the true character of human beings, an area overlooked by the Schooling for Tomorrow project under OECD, and an international curriculum that fully reflects the virtues of eastern philosophy must be developed. To elaborate, the
philosophy of loyalty and filial piety that still exists in Korea should actively be promoted to other OECD member economies.

An example of the virtues of eastern philosophy is the prevalent belief in Thai society of life after death leading to less attachment to excessive consumption in that society. The virtues of moral and ethical decisions that determine one’s direction in life, take on a greater importance with the onset of a complex and fast-paced society.

The school is an important concept the framework of which needs to be maintained. But, it is difficult to accept schools the way they are. Schools up to now have served as a mirror that reflected the social belief of citizens. Schools embody the god of Economic Utility, the god of Consumption, the god of Technology, and the god of Secession and it is difficult to accept schools that force relationships with such gods (Postman, 1995:89). In other words, schools should provide education in a physical space where cooperation from students, accountability and consideration for others are the norm.

Recalling the words of the introduction, "All I really need to learn I learned in Kindergarten" (Fulghum): cooperation with each other; fair play; putting things back where you found them; cleaning up when you work; washing hands before you eat. Only schools can help us to teach the virtues mentioned above. However, schools should return to a more human-centered and value-centered state while avoiding the darker aspects of education. Not everyone with wealth and power lead happy lives. We need to think once again about the common truth that a happy person is one who is satisfied with oneself and who possesses a positive attitude for what one does.

Last of all, there needs to be a place for the deliberation of education issues between education-related scholars, teachers, parents, and learners who shape and share the vision of future
education together. Banathy (1999), by mentioning the new education system, said that it was important to make a network among various forms of education service systems (Physical, psychological, mental resources for the health of the human race), public education institutions including volunteer work agencies, and private education institutions.

For this, it is necessary to establish a space for major discourse while establishing and operating an on-line education community on an international level. Utilizing the outcome from such efforts, a space for direct experience must be set up where on-site activities such as seminars, exhibitions, group discussions, and visits can take place.

Also, it is desirable for accumulated experience and knowledge, especially the knowledge on public education, to be handled from a non-profit perspective rather than from an educational business perspective. This is especially true for public education. In this sense, the spirit of open-source principles such as that being practiced by LINUX should be promoted. Also, there must be a system to share information and knowledge among public education institutions, and such efforts should be expanded around the globe in the future.

However, for the successful operation of such a sharing system, trust and accountability between participating institutions must be built first. Without trust and accountability, it is inevitable that the database will be filled with miscellaneous data to which anyone can gain access any time on the internet because institutions will compete to collect data as fast as they can in order to fulfill the quantity allocated to each. High quality, refined data and knowledge should be collected. To this end, an international school network consisting of previously-mentioned excellent schools, excellent teachers, schools where participants can exchange excellent knowledge, and schools that are equipped with facilities
needed for joint activities, sharing of ideas and beliefs, with a support system, must be established. Already in Korea, there is a good example of such a system, "EDUNET," where education related materials and various databases are mounted on one public network so that those engaged in education can conveniently use and share useful information. We are facing the phase where we need to find useful tips that can be shared internationally and gained from the know-how acquired while operating EDUNET, and joint effort is required to revise, supplement, and share know-how on an international scale.
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