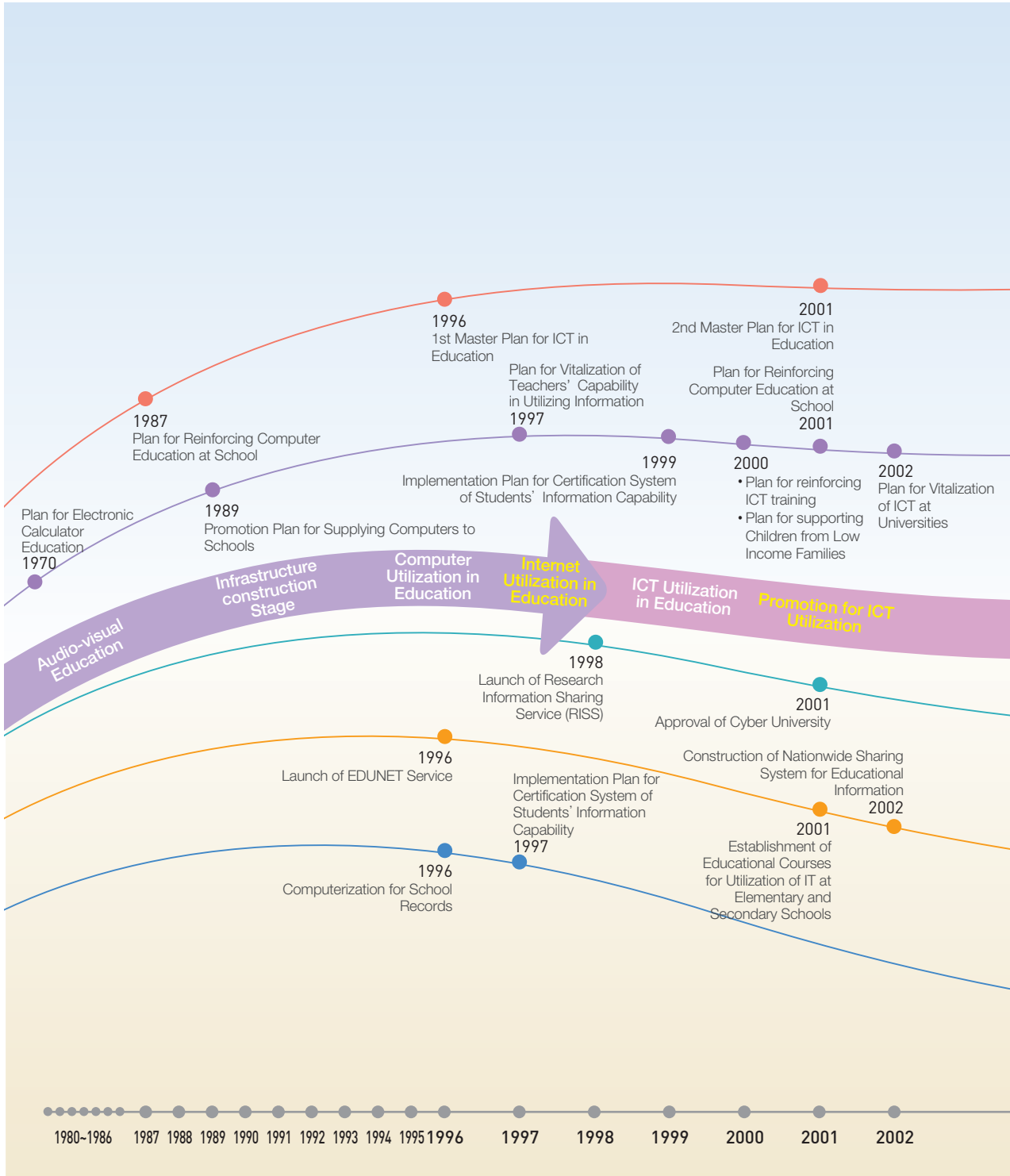
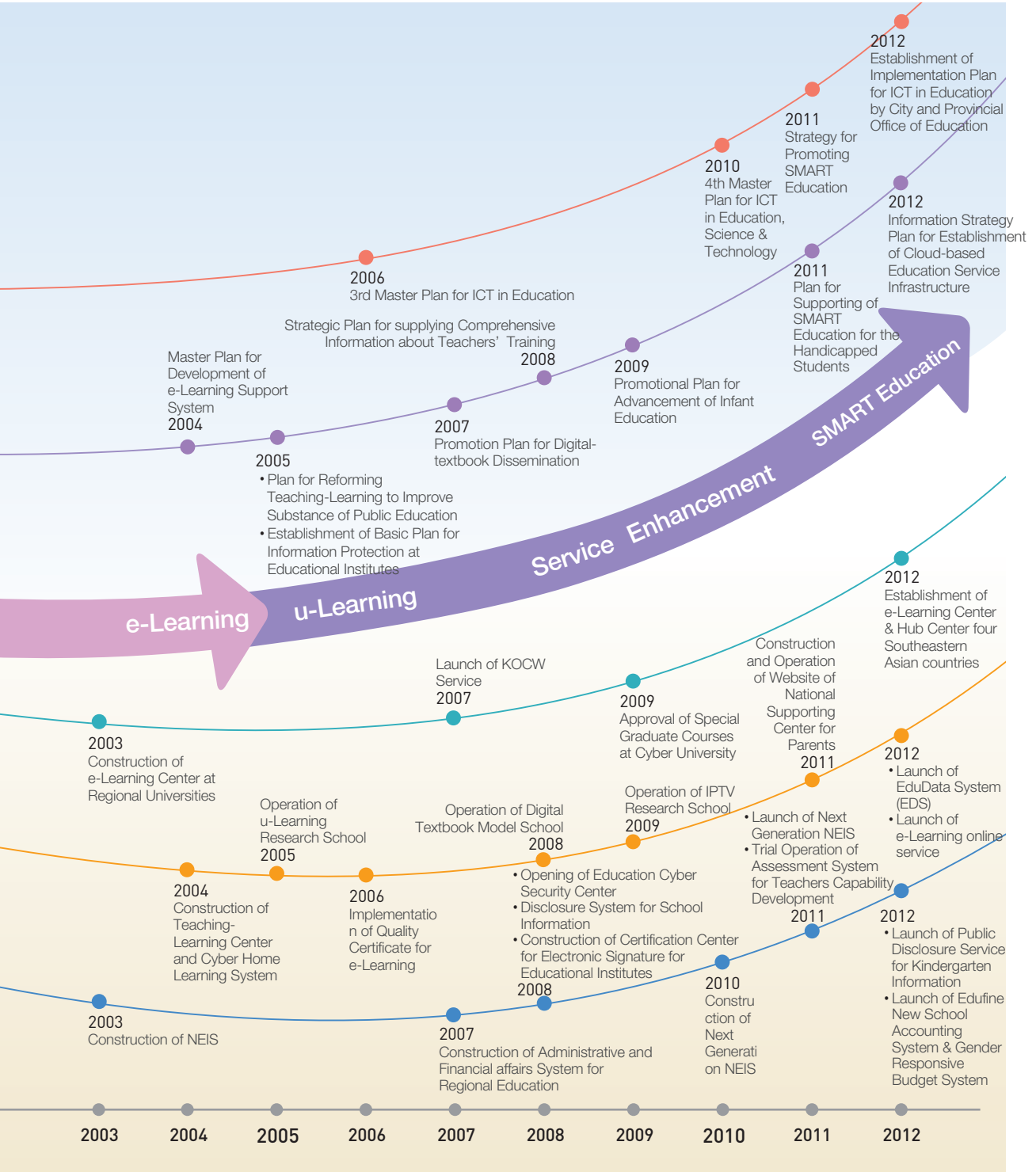




# 2012 Adapting Education to the White Paper Information Age

# ICT Chronicle at a Glance





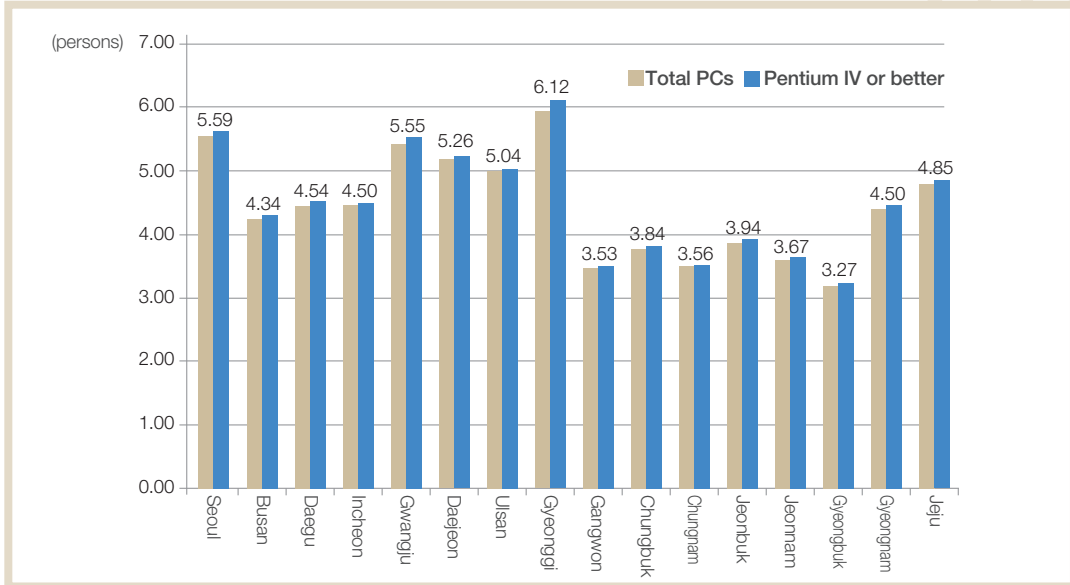


# 2012 ADAPTING EDUCATION TO THE INFORMATION AGE

## Statistics on Adapting ICT in Education

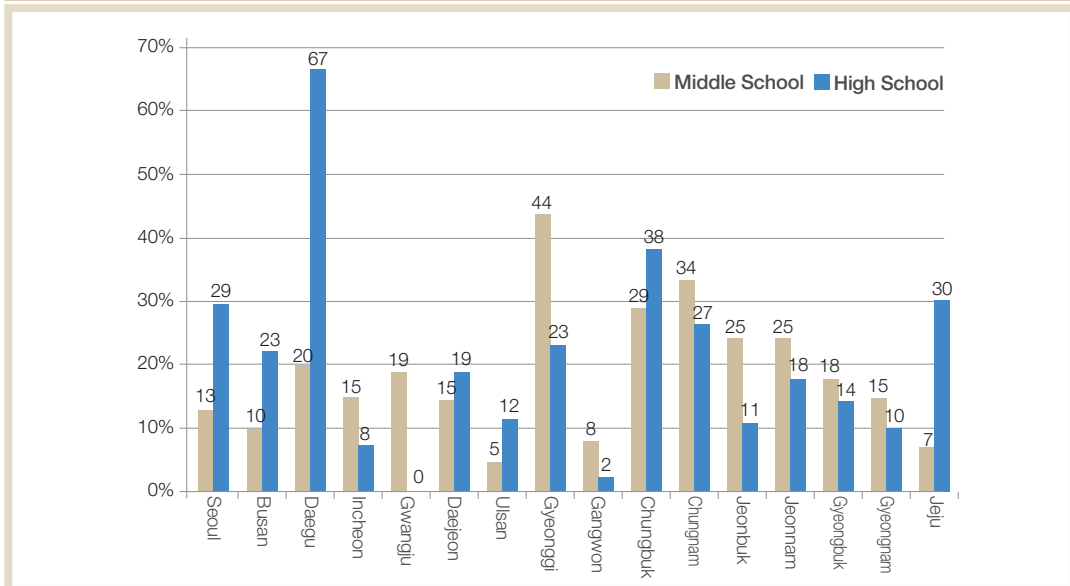
1. Number of Students per PC
2. Ratio of Schools with Elective ICT Subjects at Secondary Schools
3. Status of EDUNET Utilization
4. Status of Cyber Home Learning Utilization
5. Status of Support for Students from Low-income families
6. Status of Distance Education Training Institutes
7. Number of RISS Users
8. Status of Cyber Universities
9. Status of International Exchange Cooperation
10. Results of PISA Digital Reading Assessment (DRA)

### 1. Number of Students per PC



※ Source: Center for Educational Research, Korean Educational Development Institute, 2012

### 2. Ratio of Schools with Elective ICT Subjects at Secondary Schools



※ Source: Center for Educational Research, Korean Educational Development Institute, 2012

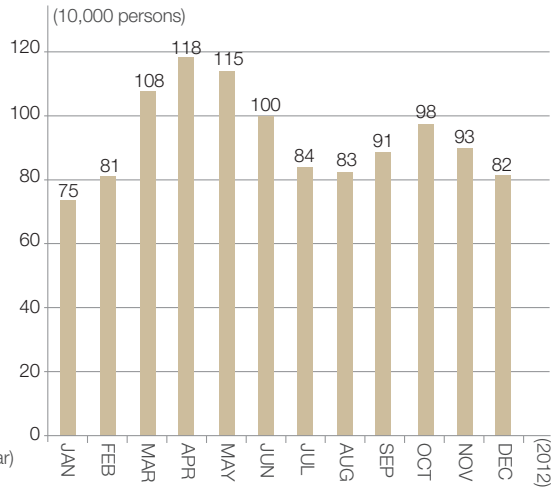
# Statistics on Adapting ICT in Education

## 3. Status of EDUNET Utilization

■ Number of Subscribers by Year



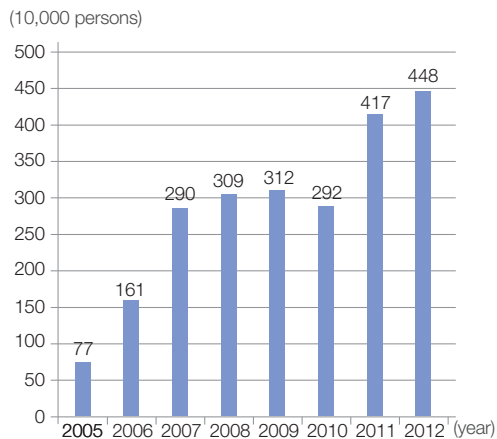
■ Number of Daily Page Views



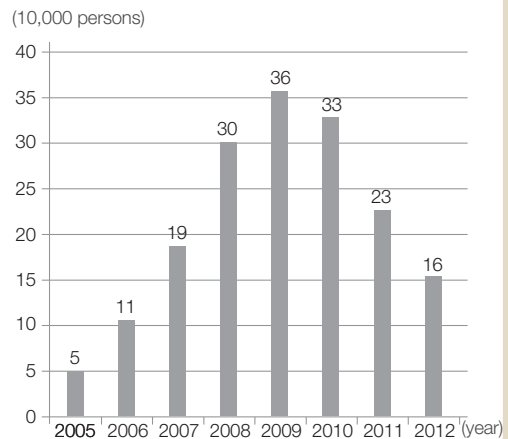
※ Source: Korea Education and Research Information Service, 2012

## 4. Status of Cyber Home Learning Utilization

■ Number of Student Members by Year

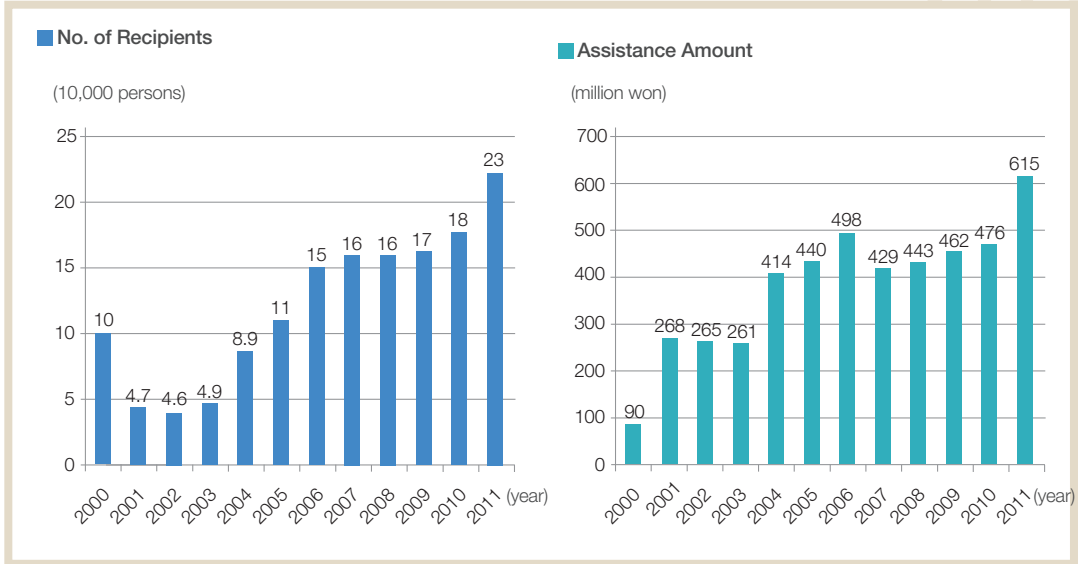


■ Number of Average Daily Log-ins by Year



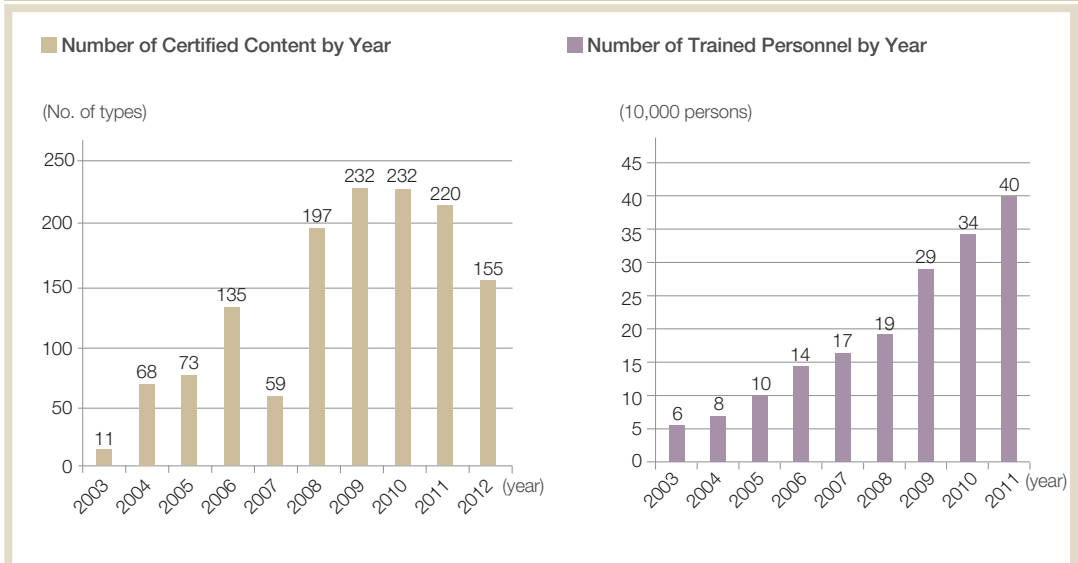
※ Source: Korea Education and Research Information Service, 2012

### 5. Status of Support for Students from Low-income families



※ Source: Ministry of Education, Science and Technology, 2012

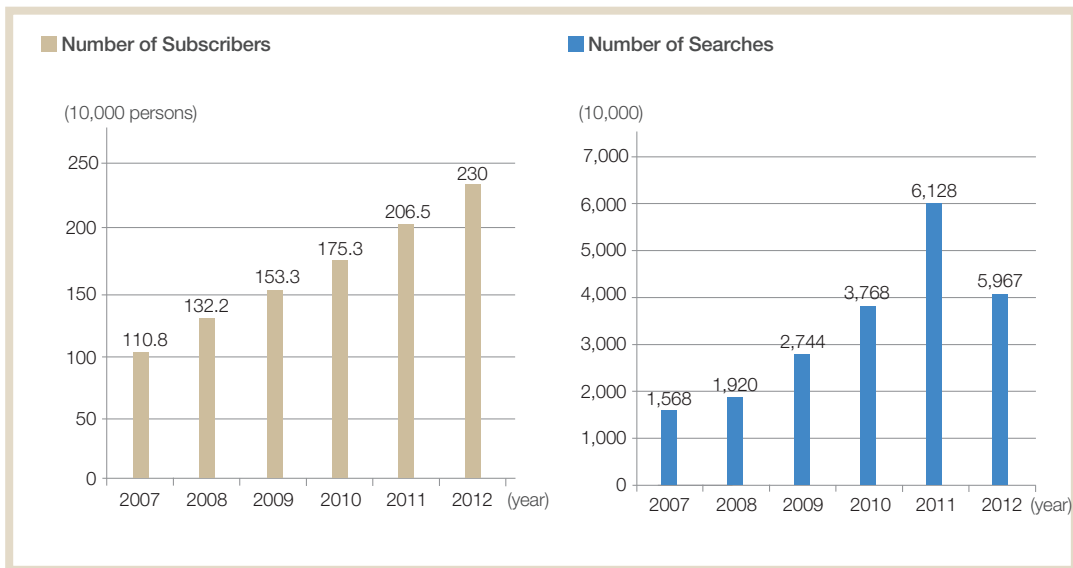
### 6. Status of Distance Education Training Institutes



※ Source: Ministry of Education, Science and Technology, 2012

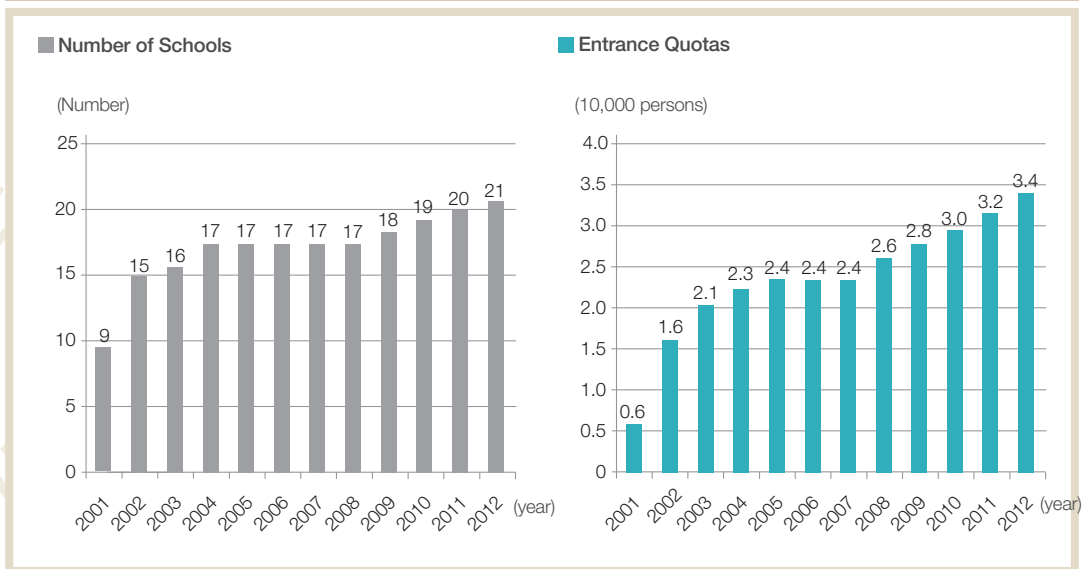
# Statistics on Adapting ICT in Education

## 7. Number of RISS Users



※ Source: Korea Education and Research Information Service, 2012

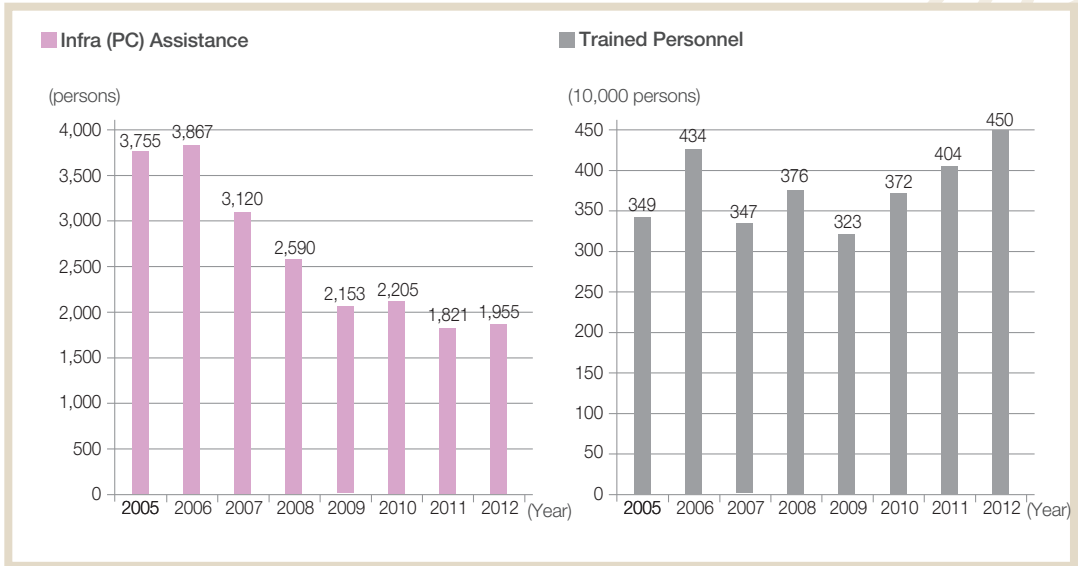
## 8. Status of Cyber Universities



※ Source: Ministry of Education, Science and Technology, 2012

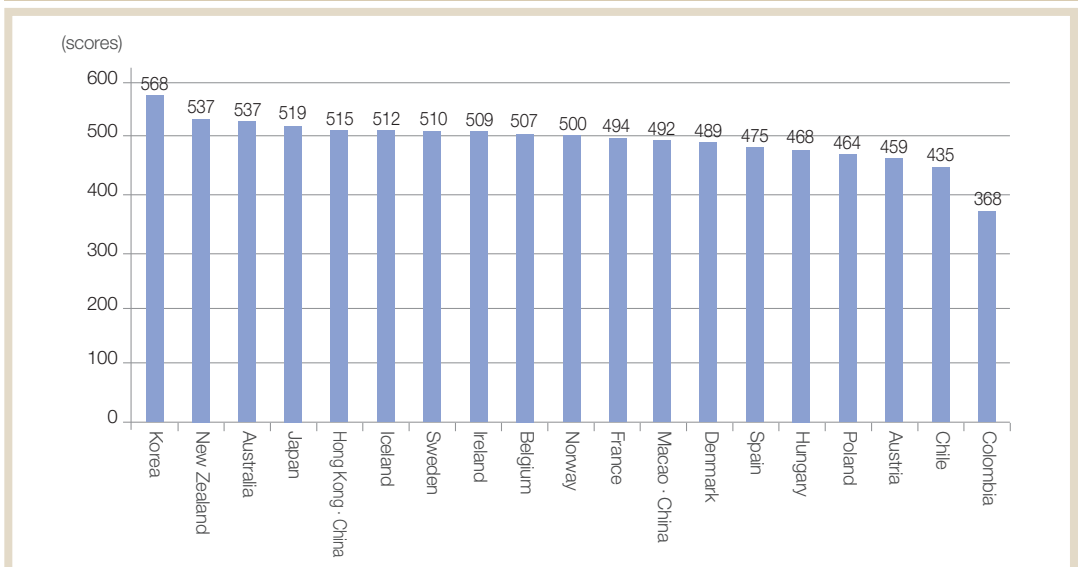


### 9. Status of International Exchange Cooperation



※ Source: Korea Education and Research Information Service, 2012

### 10. Results of PISA Digital Reading Assessment (DRA)



※ Source: OECD(2011). PISA 2009 Results



## Special

Status of SMART Education and Future Tasks .....	12
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## Overview

1. Policy Status and Implementation Strategy for ICT in Education .....	18
2. Current status of Promotional System for ICT in Education .....	20
3. Legal System of ICT in Education .....	21
4. International Trends in ICT in Education .....	21

## I. ICT in Kindergarten, Elementary and Secondary Education

1. Policy of ICT in Education .....	24
2. Teaching & Learning Support System .....	32
3. Establishment of Infrastructure for ICT in Education .....	41

## II. ICT in of Educational Administration and Finance

1. Establishment and Operation of the National Education Information System .....	46
2. Establishment and Operation of the Integrated System for Administrative and Financial Affairs of Regional Education .....	49
3. Operation of the Education Information Disclosure System .....	50
4. Establishment and Operation of the EduData System .....	53
5. Establishment and Operation of Educational Administration System for Metropolitan & Provincial Offices of Education .....	55

## III. ICT in Higher Education

1. Support for ICT in Universities .....	58
2. Status of Distance Universities .....	62

## IV. ICT in Academic Research

1. Status of ICT in Academic Research .....	64
2. Sharing and Circulation of Research Information .....	67

## V. ICT in Lifelong Education

1. Lifelong Education Information Network Service .....70
2. Lifelong Education System Support Service .....72

## VI. ICT in Career and Vocational Education

1. Career and Vocational Education Service .....74
2. Human Resource Information Service .....76
3. Private Qualifications Information Service .....78

## VII. Reducing the Educational Gap

1. Addressing the Education Gap for Low Income Families .....80
2. ICT in Education for the Handicapped .....81
3. ICT in Hospital School .....83

## VIII. Creation of Healthy Cyber Culture and Privacy Protection

1. Creation of Healthy Cyber Culture .....84
2. Prevention of ICT-related Side Effect .....88

## IX. International Cooperation in ICT in Education

1. International Cooperation in ICT in Education .....92
2. e-Learning International Consulting .....96

## X. ICT in Education in the Private Sector

1. ICT in Education by Private-sector Councils .....98
2. Status of e-Learning Industry .....100

# Status of SMART Education and Future Tasks

## 1. Background

### ※ What is Smart Education?

SMART Education is an education system designed to strengthen the capabilities of 21st century's learners by offering an intelligent and customized learning solution. SMART aims for a driving force that will innovate the education system including education environment, method and evaluation. As the initials of SMART indicate, it is self-directed (learning attitude), motivated (interest), adaptive (aptitude and ability), resource enriched (plenty of learning materials) and technology embedded (ICT utilization).

To bring innovation to the overall school education system, a comprehensive measure should be implemented based on improvement of the system and teachers' capabilities, which require active support. To this end, the President was briefed on a "Roadmap to a Human Resource Powerhouse, SMART Education Strategy" at the Blue House on June 29, 2011, by the President's Council on Informatization Strategies and the Ministry of Education, Science and Technology (MEST). The ultimate goal and vision of the SMART Education strategy is to foster "creative global human talents through "classroom revolution," which is expected to innovate education content, teaching and evaluation methods, and educational environments in tune with an educational paradigm shift.

This comprehensive policy measure requires various promotional tasks;

- ① Development and application of digital textbooks
- ② Strengthening teachers' capabilities for implementing SMART Education
- ③ Securing high quality educational content and promotion of its availability
- ④ Development of teaching and learning models
- ⑤ Revitalization of online classes and establishment of online assessment system
- ⑥ Establishment of the foundation for a cloud-based education service
- ⑦ Reinforcement of education on ICT ethics to resolve ICT-related side effects

## 2. Progress

SMART Education has been built and developed on the outcomes of the ICT in education policy, which started in 1987. In the 1990s, Korea dramatically developed its information & communications technology (ICT), the backbone of a knowledge-based society, and became an IT powerhouse. The nation built the Infrastructure including Internet networks for primary, middle, and high schools in late 1990s. From 2001 to 2007 Korea had reinforced the infrastructure for ICT in education and introduced an e-learning system. As a result, it contributed to improving learning effects and bridging educational gaps by utilizing

Classification	e-Textbook (First Semester of 2011 ~ First Semester of 2012)	e-Textbook 3.0 (Second Semester of 2012)	Digital Textbook (to be introduced in 2014)
Purpose	<ul style="list-style-type: none"> <li>• Conserving Paper Textbook into PDF format</li> </ul>	<ul style="list-style-type: none"> <li>• Cost Saving by Online Distribution and Being Available at any time with Internet</li> </ul>	<ul style="list-style-type: none"> <li>• Strengthened Learning Function &amp; Being Operable on Various IT Devices</li> </ul>
Distribution Method	<ul style="list-style-type: none"> <li>• Offline Distribution with CD</li> </ul>	<ul style="list-style-type: none"> <li>• Online Distribution (Download from the Internet)</li> </ul>	<ul style="list-style-type: none"> <li>• Real time Operation during class with Smart Education platform &amp; 365day-24hour Availability Provision of Online Learning</li> </ul>
Study Material	<ul style="list-style-type: none"> <li>• Curriculum</li> </ul>	<ul style="list-style-type: none"> <li>• Curriculum</li> <li>• A Variety of Catch-up Learning Materials (Flash, Animation, Videos, 「Multimedia」, 「Unit Text」, 「Incorrect Answer Note」, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Curriculum</li> <li>• A variety of Catch-up Learning Materials (Flash, Animation, Videos, Multimedia, 「Unit Text」, 「Incorrect Answer Note」, etc.)</li> <li>• Interactive Learning Materials</li> <li>• Utilization of Contents in affiliation with Open-type Open Market</li> </ul>
Learning Support Management Function	<ul style="list-style-type: none"> <li>• No related issue</li> </ul>	<ul style="list-style-type: none"> <li>• Affiliation with Simple External Material (Hyperlink)</li> </ul>	<ul style="list-style-type: none"> <li>• Joint Cooperation through Sharing Storage and Collaboration Tools</li> <li>• Learning Management such as Learning History &amp; e-Portfolio, etc</li> </ul>

Cyber Home Learning and IPTV.

### 3. Major Achievements and Content

With an aim to implement SMART Education in full swing from 2015, the nation considers it as a top priority for 2012 to establish the institutional foundation to introduce “digital textbooks” for innovation of educational content, method and environment, to offer training to enhance teacher’s capabilities to practice SMART Education, to develop a SMART Education model, and to reinforce the system for the utilization of online lessons.

#### A. Development and application of digital textbooks

Digital textbooks were developed in 2007, were applied to 132 model schools and have been advanced while continuously reflecting

the demands of schools. A digital textbook combines the curriculum of the existing paper textbook with various reference resources and learning support functions, and it can be run on PCs, smart pads or TV, and other digital devices. Digital textbooks can be used anytime and anywhere for the convenience of students and will be used together with paper textbooks. In addition to this, the nation is pursuing to develop and apply a proper teaching model using a digital textbook, and is trying to secure a legal status for the use of digital textbooks, change the distribution method, and revamp copyrights at the same time.

#### B. Augmenting teachers’ capabilities for implementing SMART Education

For utilization of SMART Education, the

Table 2. List of Donation Contents from Education Donation Affiliated Institutions

Content	No. of Programs (minutes)
Human Resources Development Service of Korea Video Contents about Vocations	1,600
Arirang International Broadcasting's Korean Study	300
Korea Invention Promotion Association's Science Class Content	129
Korea Invention Promotion Association's History Content	2,753
Korea Creative Content Agency's Audio Content on Oriental Paintings	8,857
DaeGyo Teachinglap	14,000
Korea Culture Information Center	1,600
SBS Content Hub's Video (Documents, etc.)	10,000 minutes
KBS Media (Personality Education, TV Special Lecture)	800 minutes.

top priority is to strengthen teachers' SMART capacity. The training programs are being developed in consideration of the ubiquitous smart ICT, current social communication culture through SNS, and new teaching methods already implemented at schools. In particular, the training is designed to help teachers nurture the capacity of 21st century learners' including creativity, collaboration ability, communication ability and critical thinking and problem solving ability. As part of an education sharing effort and in order to improve teachers' understanding about SMART education and identify and share outstanding practice examples by teachers at schools, private-sector businesses are planning a national training tour for teachers called, 'SMART Education Concert,' in cooperation with the Ministry of Education, Science and Technology.

### C. Securing high quality educational content and promotion of its availability

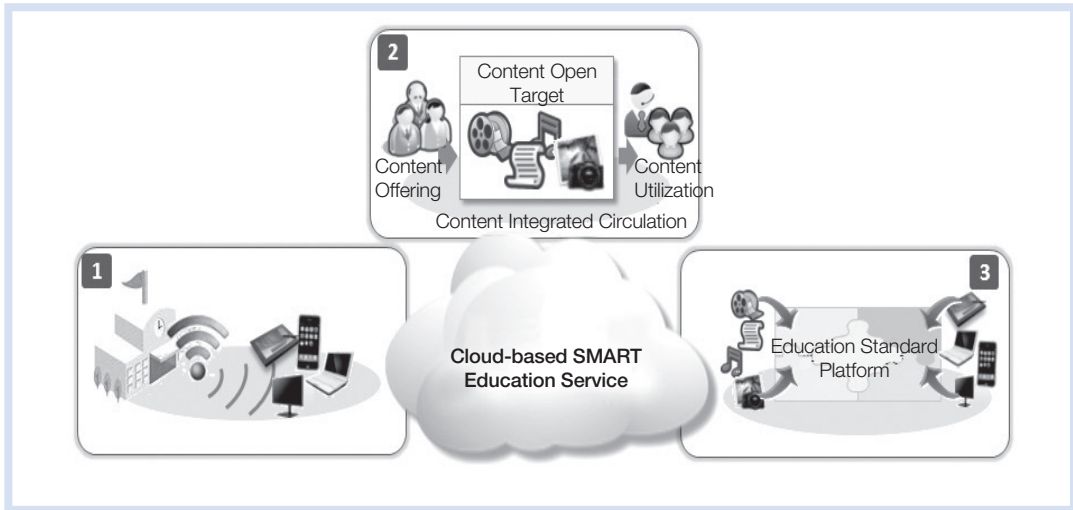
What is necessary for the innovation of classroom lessons is education content. For wider utilization of the content, the copy-

rights law needs to be reviewed. The Ministry of Education, Science and Technology is trying to overhaul the copyrights law by carrying out a sharing & donation campaign for greater utilization of various quality educational contents at schools and education offices.

A article 35-3 (Fair Use of Copyrighted Material), newly added to Copyright Law in November 2011, states that educational institutions and educational support institutions may use parts of a copyrighted material for educational purposes with the consent of the copyright holder for free. In the same context, the online transmission of textbooks including e-textbooks and digital textbooks were allowed in March 2012 after continuous consultation with the Ministry of Culture and Tourism.

More effort has been made to secure high quality educational contents. By expanding the MOUs with public institutions and private-sector companies, it has secured quality teaching and learning contents and promoted their wider utilization by teachers and students. As of 2012, it signed MOUs for edu-

Figure 1. Schematic Diagram for Cloud-based Education Service



cational sharing with a total of 10 private and public institutions from March to July 2012, classified content by subject and theme, and built a metadata database.

#### D. Development of teaching and learning models

SMART Education is in pursuit of a teaching and learning method that can nurture creativity, collaboration, problem solving ability, and communication skills. To develop such a teaching and learning model, 120 pioneer teachers and, other teachers with great interest and SMART Education model schools participated in various activities in 2012. They developed various models that use Web 2.0 for data collection, Google 'Documents' and 'Evernote' for collaboration, and a SNS for debate. It operated a SMART classroom for the successful establishment of SMART education at a school level. The SMART classroom has a structured system according to its goals such as

classroom lesson improvement and solution to the education gap.

#### E. Revitalization of online classes and establishment of online assessment system

Online classes expand the boundary of education beyond the bricks and mortars of schools to cyber space where students can participate in hands-on experiences, experts' lessons and remote video-conference lessons. Moreover, the online class enables those students who cannot attend schools because of physical disabilities, disasters and diseases to continue their study. It needs to be further reinforced for those who cannot commute to school because of geographic conditions or those who have to complete some of the required subjects that they miss because of an intensive course. In addition, the online class can contribute to bridging educational divides and strengthening students' rights to study. As it accumulates a

substantial amount of personal data, it can offer a customized education through analysis and diagnosis with evaluation tools and can conduct an online test to help students continue their study. For example, it conducts the National English Ability Test (NEAT) and the National Assessment of Educational Achievement as an IBT.

#### **F. Establishment of the foundation for a cloud-based education service**

In SMART Education, two-channel education, data sharing and collaboration are also important factors. To this end, the nation is planning to build cloud-based computing infrastructure for SMART Education to encourage students to store their study materials and records in cyber space to share them with their friends and collaborate. The cloud-based system is expected to enable to integrate separate education service resources and offer greater convenience to users and save IT infrastructure expenses. As part of the effort, the nation implemented Information Strategy Planning (ISP) for constructing the cloud-based infrastructure for SMART education.

### **4. Future Tasks**

It requires continuous research efforts and agreement between the concerned government departments and stakeholders for the SMART Education policy to take root at schools and several important issues must be addressed. First, continuous efforts need to be made to revamp the related laws and

institutions for better utilization of digital textbooks. To promote online lessons and the use of digital textbooks, more quality educational contents need to be secured and the environment for wider utilization of contents in education has to be created.

An intensive management system in charge of educational content copyrights, which allows copyrighted works to be used freely for educational purposes, needs to be established. In addition, the government needs to come up with measures to secure high quality copyrighted materials for their utilization in education through a sharing and donation of educational contents and collaboration. The ultimate purpose of SMART education is to help students study in a self-directed way with the help of plenty of study resources and various learning methods and create and reproduce knowledge, which will lay the foundation for Korean people to become globalized democratic citizens with a sharp competitive edge on the global scene. In doing so, Korea will become a powerhouse in human resources.





## Overview of Adapting Education to the information Age

### 1. Policy Status and Implementation Strategy for ICT in Education

#### A. Master Plan for ICT in Education (Stage 1-3)

ICT in education has been promoted in three stages in Korea: Initial stage (1996~2000), expanding and stabilizing stage (2001~2005) and the advanced stage (2006~).

During the initial stage, all schools and classrooms were equipped with PCs and teacher's platforms were furnished with advanced devices. The construction of Internet networks was completed in 2000. In addition, major educational information services such as EduNet, RISS, etc. were made available and the satellite broadcasting station was opened. The task force team was also created around that time. The second phase of expanding and stabilizing promoted ICT in education by improving classroom lessons with utilization of ICT infrastructure, supporting cyber self-directed study and establishing the National Educational Information System and further accelerated ICT adoption in elementary, secondary, higher, and lifelong education. Finally, the advanced stage introduced an e-learning system, operated a trial of digital textbooks, and established the Integrated System for Administrative and Financial Affairs of Regional Education (EduFine). During the third stage, it started an overseas project to

promote Korea's advance education information system around the world and paved the way for the outcomes of Korea's ICT to make inroads into other countries.

#### B. Master Plan for ICT in Education, Science and Technology (Stage 4)

The master plan for ICT in Education, Science and Technology announced by the ministry of Education, Science and Technology in 2010 has three major priorities. First, it is to overcome the limits of the ICT in education policy with its focus on the promotion of infrastructure and accelerate soft-power for enhancement of national competitiveness. Second, it will support stakeholders in the fields of education, science and technology to organically participate in activities and collaborate with each other, based on communication and conversion, to foster human resources, and realize the goal of becoming a powerhouse in science and technology. Third, it will introduce the 'Study-Research Ecosystem' for green growth and create a virtuous circle within the education system. The master plan for ICT in Education, Science and Technology consists of 4 sectors and 62 tasks. The four sectors are to foster creative human resources, strengthen advanced R&D capacity, expand communication and conversion services, and establish the infrastructure for ICT in education, science and technology.

Table 3. ICT Implementation System by Ministry of Education, Science and Technology		
Classification	Major Roles	
President's Council on National ITC Strategy in Education	<ul style="list-style-type: none"> <li>Overall Management &amp; Coordination of National ICT Plans</li> </ul>	
Ministry of Education, Science and Technology	Administrative Management Officer	<ul style="list-style-type: none"> <li>Overall Management &amp; Coordination of Internal ICT</li> </ul>
	Educational Information and Statistics Division (KERIS)	<ul style="list-style-type: none"> <li>Planning of ICT in Education (promotion of SMART Education)</li> <li>Overall Management &amp; Coordination of Statistics on ICT in Education</li> <li>Overall Management &amp; Coordination of ICT in Education</li> </ul>
Metropolitan & Provincial Office of Education (Education Information Center)	<ul style="list-style-type: none"> <li>Overall Management &amp; Coordination of ICT in Education by Metropolitan &amp; Provincial Office of Education</li> <li>Overall Management &amp; Coordination of ICT in Elementary and Secondary Education</li> </ul>	

Table 4. Division of Tasks of Educational Information and Statistics Division, Ministry of Education, Science and Technology (as of September 2012)	
Name of Departments	Major Business
Educational Information Planning Division (SMART Education T/F)	<ul style="list-style-type: none"> <li>Planning and Implementation of Nationwide Scholastic Achievement Test</li> <li>Support for International Scholastic Achievement Test (PISA, TIMMS)</li> <li>Result disclosure and analysis of Nationwide Scholastic Achievement Test and College Scholastic Ability Test</li> <li>Evaluation of Metropolitan &amp; Provincial Office of Education and Operation of School Evaluation System</li> <li>Overall Management of Implementation of SMART Education Policy</li> </ul>
Educational Information Division	<ul style="list-style-type: none"> <li>Management of Basic Plan and Implementation Plan for ICT in Education, Science and Technology</li> <li>Establishment of Infrastructure of Cloud-based Education Service</li> <li>Establishment and Operation of National Educational Information System (NEIS)</li> <li>Support for ICT in University</li> <li>Advancement of Infrastructure for ICT in National School</li> </ul>
Information Protection Team	<ul style="list-style-type: none"> <li>Implementation of Information Protection Task of Education &amp; Research Institutions</li> <li>Implementation of Personal Information Protection Task of Education &amp; Research Institutions</li> <li>Implementation of Task of Cyber Security Center under Ministry of Education, Science and Technology</li> <li>Implementation of Task of Electronic Certification Center</li> </ul>
e-Learning Division	<ul style="list-style-type: none"> <li>Issues related to e-Learning Globalization Project and International cooperation on ITC in Education</li> <li>Establishment of Infrastructure for Cyber Home Learning &amp; Next Generation e-Learning Content Service</li> <li>Production and Operation of EBS SAT Lectures</li> <li>Support of ICT in Education for Low Income Families and the Digitally Marginalized</li> <li>Foundation of Cyber University and Special Graduate School, Enhancement of Competitiveness of Distance University</li> <li>Foundation of Korea-ASEAN Cyber University</li> <li>Vitalization of Education Service with IPTV Technology, Foundation of Ubiquitous Learning System</li> </ul>

### C. Promotional Strategy of SMART Education

The Ministry of Education, Science and Technology established the SMART Education Strategy in 2011 in consideration of

the rapidly changing IT industry and society. This plan is a strategy for ICT in education with its focus on schools, which carries out more detailed tasks and is implemented together with the master plan for ICT in edu-

cation, science and technology.

Smart Education is an intelligent and customized learning system that can be used anytime and anywhere to meet the needs of the 21st knowledge information society. Its vision, “Classroom Innovation through SMART Education” has 5 major promotional tasks; the development and application of digital textbooks, the introduction of online classes and evaluation system, improvement of copyright law for free use of educational contents, the enhancement of teachers’ capacity for SMART Education, and the establishment of infrastructure for wireless Internet at all schools (for cloud-

based education service).

## 2. Current Status of Promotional System for ICT in Education

The education informatization organization under the MESE consisted of 2 departments in charge of ICT policy, which was run in separation from the educational administration informatization office under the planning and coordination office. As part of the reorganization in 2010, the Education Information & Statistics Bureau was newly established to handle and coordinate all ICT policies by

Table 5. Status of Legal System on ICT in Education and Major Contents

General Education	Framework Act on Education, Article 23; The State and local governments shall establish and implement policies necessary for ITC in education such as providing support for trainings on ITC in education, offering education support through information and communication media, and promoting educational information industry.
Primary and Secondary Education Act	(Class) Primary and Secondary Education Act, Articles 24 and 49; Primary and secondary schools may offer broadcasting classes or correspondence courses
	(Broadcasting and Correspondence High School) Primary and Secondary Education Act, Article 51; Broadcasting and correspondence high schools may be established at high schools.
	(Textbooks) Rules on the Curriculum Books, Article 2; The term “textbooks” means books, audio records, visual and electronic works, etc. which are used in schools for the education of students.
	(Copyright) Copyright Act, Article 25; A work already made public may be reproduced in textbooks to the extent deemed necessary for the purpose of education in primary, middle or high schools. If an educational institution conducts transmission, prevention measures against reproduction shall be taken in order to prevent infringement on copyrights. Metropolitan and provincial offices of education and affiliated institutions under their direct control may reproduce the copyrighted work for education purpose and shall pay compensation.
Higher Education	(Library) School Library Promotion Act, Articles 11 and 14; The superintendent of offices of education may allocate budgets for ICT in primary, middle and high school libraries. According to article 14, the Minister of Education, Science, and Technology shall build a school library cooperation network, which links with various institutions.
	(Class) Enforcement Decree of the Higher Education Act, Article 22; Universities may conduct broadcasting classes and correspondence courses. (Distance University) Enforcement Decree of the Higher Education Act, Articles 52-54; Distance universities may establish bachelor’s degree or junior bachelor’s degree courses and confer corresponding degrees. According to Article 63, Distance universities may conduct remote teleconference lectures, etc.
Educational Administration	(Computerization of Affairs of Schools and Educational Organizations) Basic Education Act, Article 23-2; The administrative affairs of educational institutions may be processed electronically. According to articles 30-4, 30-5, 30-6, and 30-7 of Elementary and Secondary Education Act; primary, middle and high schools may process their works by using the educational information system and the Minister of Education, Science and Technology shall guide and supervise this. ※ E-Government Act; The State shall make efforts to electronically process administrative works and public services.

integrating ICT functions except for the internal ITC of the Administrative Management Division as well as evaluation and statistics related functions to strengthen policy services based on an information system.

The metropolitan and provincial offices of education are in charge of ICT in elementary and secondary education and develop policies suitable to their regions and practice them based on the national ICT policy directions that, are implemented in accordance with education support offices. In addition, the metropolitan and provincial offices of education has established and operates its affiliated institutions such as the 'Education Information Center' and 'Teaching and Learning Support Center' to support the ICT business of education support bureaus and schools under their jurisdiction.

The Seoul Metropolitan Office of Education has established and operated the Informatization Bureau under the planning and management office to handle and coordinate all ICT policies but abolished it as part of the organizational reshuffle in February 2011 and deconcentrate its work by function. The planning and coordination office currently takes control of information, security and statistics policies, while the education policy bureau is in charge of information service policies which that support teaching and learning.

### 3. Legal System of ICT in Education

The legislative system of ICT in education is based on the Education Law and The Arts and Science Promotion Act. The general leg-

islative articles of ICT in education are based on Article 23 of the Education Law; Article 23-2 of 'the Education Law,' Article 23-3 of 'Principles of Protection of Student Information,' and Article 26-2 of 'Opening of Information Related to Education.' Other legislative articles related to the ICT in education are provided in individual laws, such as the Elementary and Secondary Education Act, Higher Education Act, Lifelong Education Act, Special Education Act, etc.

The Copyright Law underwent a sweeping overhaul for the first time in 18 years since its introduction on December 28, 2006. One of the reasons to amend the law is to reflect a social change with the advent of a knowledge based information society. Therefore, a new media emerged by converging broadcasting and communications technologies. As Web 2.0 technologies have blurred the line between producers and consumer, many of the terms used in the existing copyright law needed to be redefined. In the meantime, the concept of 'textbooks' were limited to paper textbooks in the past but has been extended to digital content as part of the amendment to the provision of compensation for use of textbooks in 2012.

### 4. International Trends in ICT in Education

The trends of education informatization policies in Europe, the US and the UNESCO are as follows. First, digitalization and opening & sharing of education information are hot issues. In addition, the term "education

information” means not only textbooks and learning aids but also teachers and students’ teaching and learning resources, student records & grades, and teachers’ administrative work information.

Second, ICT infrastructure are being enhanced in terms of quality. In other words, major advanced countries have achieved remarkable quantitative growth by distributing PCs and establishing Internet networks, and qualitative development with aims of 1 PC per student and high-speed (wireless) Internet access.

Third, their teacher trainings for utilization of ICT using a field oriented approach. Fourth, major advanced countries have established a system to inform parents of students’ learning progress. Finally, many of them are pursuing a state-centered policy for education informatization.

### A. Overseas Institutions’ Policies for ICT in Education

#### 1) Denmark’s UNI-C(<http://www.uni-c.dk/>)

- UNI-C is an agency that offers teacher training and builds the infrastructure at schools to promote the use of IT in education. 99% of schools in Denmark have wireless Internet accesses that, are checked and maintained by UNI-C.

#### 2) The U.S. ‘Connected Online Communities of Practice in Education’

- The ‘Connected Online Communities of Practice in Education’ project is pursuing two major policies. ‘Connect and Inspire’ (<http://connectededucators.org/report/>) is an online report that utilizes the collective

intelligence of educators and encourages them to review and make a comment. ‘Community Directory’ (<http://connectededucators.org/communities/>) offers online communities of teachers.

#### 3) Belgium’s ‘ICT Without Limits’ Program

- The ‘ICT Without Limits’ policy funds the development of learning contents and teacher trainings and is pursuing three major projects; ‘The Wai-not Internet Project’ for people with disabilities ‘The Bednet Project’ for sick children, and ‘The Letop Project’ for those with learning problems like dyslexia and ADHD.

### B. ICT in Education at Home

#### 1) Denmark’s ‘Parent Intranet’

Denmark’s ‘Parent Intranet’ helps schools, students and parents communicate with each other through the system. The system includes schedules, contacts for administrative affairs, academic records and home works, and it also serves as a communication channel between parents and educators.

#### 2) France’ Digital Class Notebook

France is pursuing ‘Digital Class Notebook’ to promote the communication between parents and educators. This helps schools communicate with parents in a form of not paper but digitalized letters.



# I. ICT in Kindergarten, Elementary and Secondary Education

01

## Policy of ICT in Education

### 1. Status of ICT Curriculum in Elementary and Secondary Education

#### A. 3rd - 7th Curriculum

ICT education took place in Korea when the 3rd curriculum of general high school added computer education to the Technology subject in 1974. In 1987, when the 5th curriculum was announced, 'Computer and Life' was included as a unit of the practical course for the 6th grade and was set-up as a unit of the 'technology and home economics' subjects to educate 1st grade middle school students on computers. The high school curriculum introduced a computer lesson as a unit of the 'technology' subject and created 'information-industry' as an optional subject, which consists of an information unit, information and communications unit, computer and programming unit, etc. In 1997, when the 7th curriculum (1997) was announced, the IT contents were included not only in the subjects of 'the practical course' 'technology' and home economics,' and 'computer classes' but also in every subject to offer a chance for IT experiences. Teachers utilized IT to improve the quality of their lessons and

to strengthen overall ICT related education.

#### B. 2007 Revised Curriculum

In the revised curriculum of 2007, the titles of computer related subjects were standardized and referred to as 'Information subjects,' and therefore the identity of the subject was newly established. Subjects were revised to not only use computers as a learning tool but also to better understand knowledge and information society through the principles of information science and technology and to enhance creative problem-solving abilities and logical reasoning skills.

#### C. 2009 Revised Curriculum

Table 6. Content System of Information-related Education Courses by Primary Schools

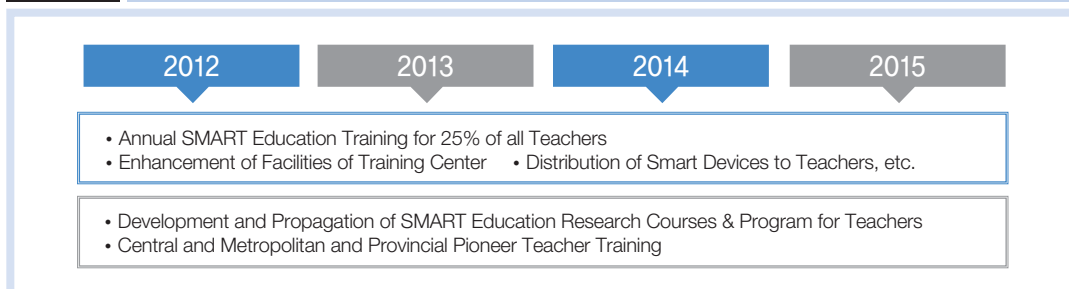
Subject	Domain	Contents
Practical Course (Grade 5-6)	Life and Information	<ul style="list-style-type: none"> <li>• T Devices and Cyber Space</li> <li>• Production and Use of Multimedia Materials</li> </ul>

Table 7. Content System of Information-related Education Courses by Middle Schools

Subject	Domain	Contents
Technology & Home-keeping (Grade 1-3)	Information and Communication Technology	<ul style="list-style-type: none"> <li>• The World of Information and Communication Technology</li> <li>• Computer and Communication Technology</li> <li>• Information and Communication Technology Experience and Problem-solving Activities</li> </ul>



**Figure 2.** Development Plan of Smart Education Teacher Capacity Development



※ Source: Korea Education and Research Information Service (2012)

The 2009 revised curriculum was officially announced on Dec. 23, 2009. However, the curriculum was once again reviewed and upgraded in accordance with the revision direction before being officially announced on August 9, 2011. The new features of 2009 revised curriculum are ‘grade cluster,’ ‘subject clusters,’ an ‘intensive completion program’ and a ‘creative hands-on experience activity.’

ICT-utilizing curriculum for better thinking abilities), which were developed and applied step-by-step. The MEST planned to develop and distribute SMART education training courses and offered them to every teacher in 2015.

## 2. Training of Teachers in ICT use

### A. Status of Teacher’s ICT Capability Development Support

#### 1) Promotion Project of Teacher’s ICT Capability Development Support

Due to the advent of information technology and the changing education environment, teacher trainings for ICT in education have been constantly carried out to enhance teachers’ ICT capacities. The ICT utilizing training program consists of a basic course (ICT-utilizing a problem-based learning course, curriculum for the future, GS (Getting Started) curriculum and an advanced course (ICT-utilizing creative learning plan course, teachers’ training course for 21st century learners, and

### 2) Implementation Status of Strengthening Teacher’s ICT Capacity

Table 8. Development Plan of Contents for SMART Education Remote Training	
Office of Education	Development Course
Incheon	Utilization of e-Textbook 3.0
	Improvement of Communication and Cooperation Capacity (Elementary Education)
Chungnam	Teaching and Learning Design for SMART Education
	SMART Education through Utilization of Various Contents (Elementary Education)
Jeonnam	Improvement of Communication and Cooperation Capacity (Secondary Education)
	SMART Education through Communication with Students (Secondary Education)
Gyeongnam	SMART Education through Communication with Students (Elementary Education)
	SMART Education through Utilization of Various Contents (Secondary Education)
KERIS	Basic Knowledge on SMART Education
	Smart Education Trial

※ Source: Ministry of Education, Science and Technology (as of April 2012)

**Table 9.** Status and Change of Remote Education Training by Year(as of October 31, 2012)

Classification	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Status of Certified Remote Education Training Centers	17	15	8	6	7	2	5	5	4	5	3	2	2
No. of Certified Contents (Types)	-	-	-	11	68	73	135	59	197	232	232	220	117
No. of Trainees (Persons)	1,820	38,202	37,216	59,836	78,567	95,575	142,429	172,386	193,621	288,030	337,284	400,790	-

The 2012 project to develop teacher's ICT capacity was mainly focused on strengthening teacher's capacity of SMART education on a large-scale. To apply SMART education in schools, the MEST, metropolitan and provincial offices of education, and public and private sectors cooperated and carried out various projects. These projects include development and distribution of teachers' training program, operation and support of the teachers' training and an ICT research contest. In terms of the development and distribution of the teacher's SMART education training program, a project to develop its' guideline was first implemented. The Korea Education and Research Information Service (KERIS) operates the SMART education training certification system to inspect SMART education-related training run by various institutions as a general training course. Along with the certification system, KERIS also promotes projects to develop on-line training programs and implements trainings for pioneer teachers to strengthen teachers' capacity to practice SMART education.

## B. Operational Status of Distance Teacher Training Center

### 1) Outline of Distance Teacher Training Center

Only 1,820 teachers received distance teacher training when it first started in 2000 but the numbers continuously increased and a figure shows that 400,790 teachers have received trainings from 42 officially approved Distance Teacher Training Centers(DTTC) in 2011. To continuously improve convenience and efficiency of sustainable distance teacher training, quantitative growth should be achieved along with qualitative growth. And therefore, consultation support based on a systematic quality management is needed to operate the DTTC.

### 2) Operation of Distance Teacher Training Center

According to a provision on the Distance Teacher Training Support Center (Presidential Decree) on June 1, 2009, KERIS was designated as the Distance Teacher Training Support Center in order to further advance the distance teacher training and support the DTTC.

The distance teacher training centers shall be designated and approved by the MEST and be run according to each training center's operation plan and related rules. Any distance teacher training center candidate has to obtain an approval and certification in accordance with related legislations and designa-

Classification	Name of Institution
Central Training Centers	National Training Institute of Education, Science and Technology
	Korea National University of Education's Center for in-Service Education
	Korea National Open University's Comprehensive Education Training Center
	Seoul National University's College of Education affiliated Educational Administration Training Center
University Affiliated Training Center	84 Institutions including Gangwon National University's College of Education affiliated Secondary Education Training Center
Metropolitan and Provincial Training Center	23 Institutions including Seoul Metropolitan Education Training Center, etc.
Remote Education Training Center	44 Institutions including Education Training Center of the Korean Federation of Teachers' Associations, etc.
Total	155 Institutions

tion standards of the distance teacher training centers to ensure that those credits which teachers or education public officers obtain at that training center are recognized by the state. Meanwhile, an evaluation is held against the certified distance teacher training centers to assess their operation every year

to maintain the high quality of the distance teacher training centers. The quality management on the training courses run by the distance teacher training centers is designed to prevent trainees from receiving any disadvantages due to below-standard training courses and to promote the development of high-quality training content.

### 3. Online Class and Evaluation

#### A. Outline of Online Class and Revitalization

Online classes, which were introduced in 2012, have been developed as a form of broadcasting or correspondence classes. This online class can guarantee students, who are unable to attend school, a right to learn and choose subjects. It includes real-time or non-real-time learning programs taught by teachers.

Unlike existing e-learning where students study as a form of self-learning, this online class is similar to regular classes where licensed school teachers instruct and supervise the students to keep up their study like a

Type	Contents
Online Class for Curriculum not available at High School	- Completion of Curriculum not available at High Schools through Online Classes - Selection of Online Classes through Research of Students' Demand
Online Class for those Transferred Students who have not completed Intensive Requirement Subjects	- Those transferred middle school students who have not completed intensive requirement subjects can complete them through online class.
Online Class using Remote Video Teleconference	- Those who have limited education opportunities due to geographical conditions can complete their required courses through online class. - Those who cannot attend classes due to diseases, hospitalization, or natural disasters for a long time can complete curriculums through online class.
Supplementary and Advanced Class after School	- Supplementary and advanced classes at home after school.

conventional school class, encourage students to participate in class, and evaluate what they have learned. Therefore, this kind of class is also recognized as a regular class. The online class will firmly settle the education welfare policy by minimizing a long-term learning gaps resulting from physical disabilities, disasters and diseases, securing student's right to learn rarely-available optional curriculum, and strengthening education activity for students who live in remote areas.

The 2012 online class was run as a form of test-operation. And instead of developing a new system and content, existing contents were evaluated and upgraded. First, the Broadcasting Correspondence High School system, which is operated by the Korea Education Development Institute (KEDI), was used in the online class system for courses that were not opened in high school. The cyber home study system, operated by metropolitan and provincial offices of education, was used for online classes to help middle school students to complete those subjects that they couldn't due to an intensive

completion system.

## B. Establishment and Operation of National Online Evaluation System (NEAT)

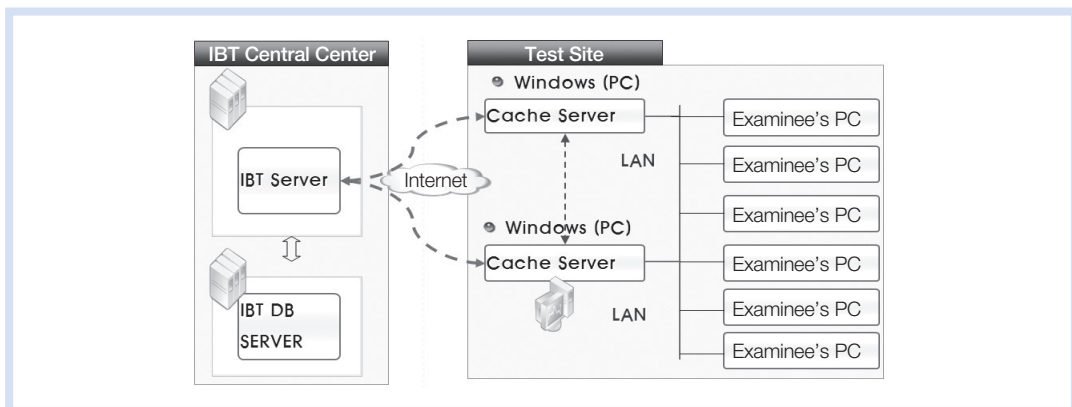
### 1) Project Outline

The MEST and the Korea Institute of Curriculum & Evaluation (KICE) applied cloud computing technology to a large scale online evaluation for the first time in the world. The cloud computing method is now taking the lead to drive change in other evaluation systems. The National English Ability Test (NEAT) was developed in July 2007, based on a master plan called the 'Introduction of NEAT,' in order to strengthen English competitiveness and to lower the dependence upon foreign tests. This test evaluates expression abilities such as listening, and reading as well as speaking and writing.

### 2) Promotion Status

If NEAT replaces the function of the College Scholastic Aptitude Test (CSAT), about 600,000 entrants will have to take the test twice a year, which adds up to 24 times

Figure 3. National English Ability Test CS System



before graduating from high school. This large-scale testing uses the NEAT VDI system for exam questions, scoring and operation. The NEAT VDI is comprised of various systems such as resource pool management, training management, question-setting, an item pool, grading, result-analyzing and reporting systems. Among them, the item pool system is the core element. It implements management functions such as question type, metadata, question-setting conditions, questionnaire composition and distribution, etc. Meanwhile, the number of vocabularies that are used by NEAT for Grade 2 and 3 are limited to less than 3,000 and 2,000 respectively, and selected based on the curriculum. It decides which vocabularies can or can't be used for Test Grade 2 and 3, and exceptions can be made and managed by the NEAT agency. Also, the system can define the proportion of available vocabularies, exception words, and the rules of acceptable ranges of KSAT vocabularies.

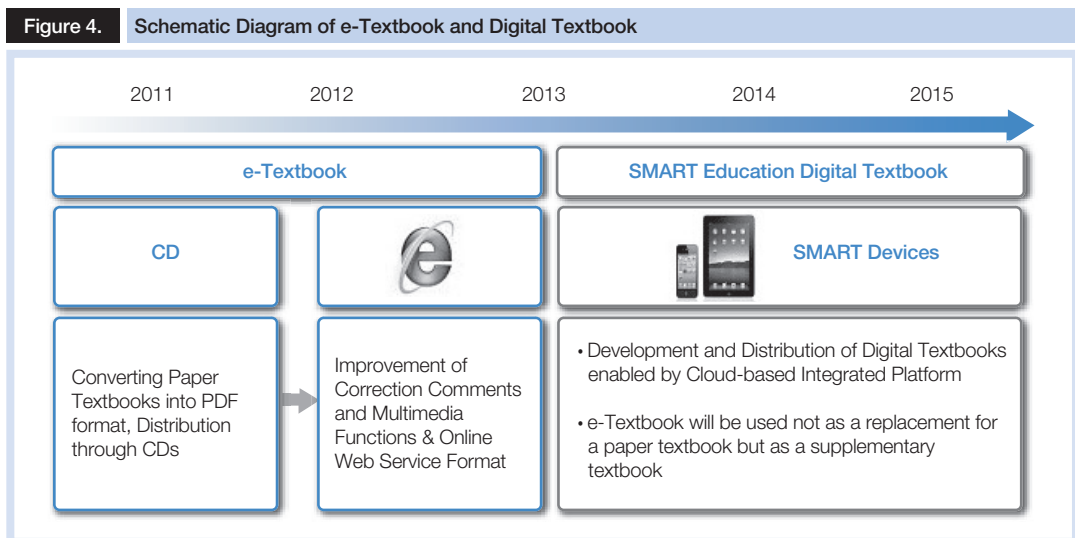
Registered vocabularies can be maintained as a type of wordbook. The created wordbook can be imported or exported and can be easily revised.

#### 4. Development and Maintenance of Digital textbook

##### A. Outline

The digital textbook was introduced in a bid to make good textbooks that can promote and guide learning. A test-operation began in 2007 and through the SMART education promotion strategy, announced in 2011, the plans to apply digital textbook in schools step-by-step starting from 2014 was prepared.

The digital textbooks contain the curriculum of original textbooks and have more learning materials and learning support and management functions such as a glossary, multimedia data, evaluation questions, intense and supplementary contents, and



more. Digital textbook could also be linked to external data, for instance, open markets for educational contents.

## **B. Promotion of Digital textbook**

### **1) Outline of Progress by Year**

The digital-textbook program started in earnest when the Education Minister announced 'the Promotional Plan for Digital textbook Dissemination' in 2007. In 2011, 5th and 6th graders' digital textbook for Korean language and mathematics were evaluated, revised and were used in 63 model schools. Through the 'Promotional Strategy of SMART Education,' which was announced in June 2011, the yearly promotion plan was prepared to fully apply digital textbooks starting in 2014.

In 2012, the strategy plan for SMART Education, which was set up in 2011, has been implemented in earnest to introduce digital textbooks. A notification about the separate usage of textbooks for elementary and middle school was revised and notified again after specifying the development of digital textbooks for subjects in social science, science and English. The plan for verification to evaluate digital textbook for elementary school' English and middle school' social science to be applied in 2014 was announced as well. Also, the digital textbook was upgraded and can be transmitted online for interoperation with the e-textbook, which had been run through a separate promotion project.

### **2) Operation of Model Schools and Construction of Educational Environment**

To minimize trials and errors before fully

applying digital textbooks, model schools are being operated to collect opinions from teachers and students and to reflect their requirements. Through this strategy, digital textbooks can be developed and their usage can be promoted in the education fields. To ensure internal stability, 63 model schools that were selected in 2011 were downsized to 46 schools in 2014. Each model school has a digital textbook learning environment including one electronic bulletin board, one learning device per student, two or three wireless network APs, and more.

## **5. Current Status of SMART Education Model School**

### **A. Project Outline**

To identify various outstanding examples of SMART education for its further expansion and come up with measures to revitalize it, SMART education model schools were appointed and operated by the nation and by metropolitan and provincial offices of education. The model schools seek multilateral ways to expand their education system in general schools, by upgrading the curriculum of the SMART education, teaching and evaluation methods, and educational environment.

### **B. Progress**

From 2012 to 2013, a total of 40 SMART education model schools were selected and are currently in operation. In consideration of curriculum, teaching method and evaluation as well as various educational environ-

ments, the 8 types of models such as the SMART classroom, online class, etc. have been developed and operated in real schools to materialize the revitalization plan and promote and apply applicable outstanding examples in other schools.

※ **SMART Education Model (8 types)**

-Smart Classroom: General Class, Special Classroom Class, Classroom Integrated Class, Creative Hands-on Experience Class

-Online Classroom: Selective Curriculum, Uncompleted Curriculum, Online Teleconference Curriculum, After School Makeup Class

### **C. Major Achievements**

The metropolitan and provincial offices of education and model schools held regular working-level consultative meetings to share useful information including the model schools' operation plans and various operation directions. Basically, they are planning for experimental activities, which utilize the existing infrastructure, and to test the SMART Education model schools from various aspects, such as : general classroom lecture, special classroom lecture, combined classroom lecture, creative experimental activity, and more.

Related workshops, teacher trainings and consultation meetings were held to support and encourage central pioneer teachers, offers a space where teachers can share their field experiences and knowhow, and communicate with each other on and offline.

## Teaching & Learning Support Service

### 1. Current Status of ICT in Infant Education

#### A. Background and Progress

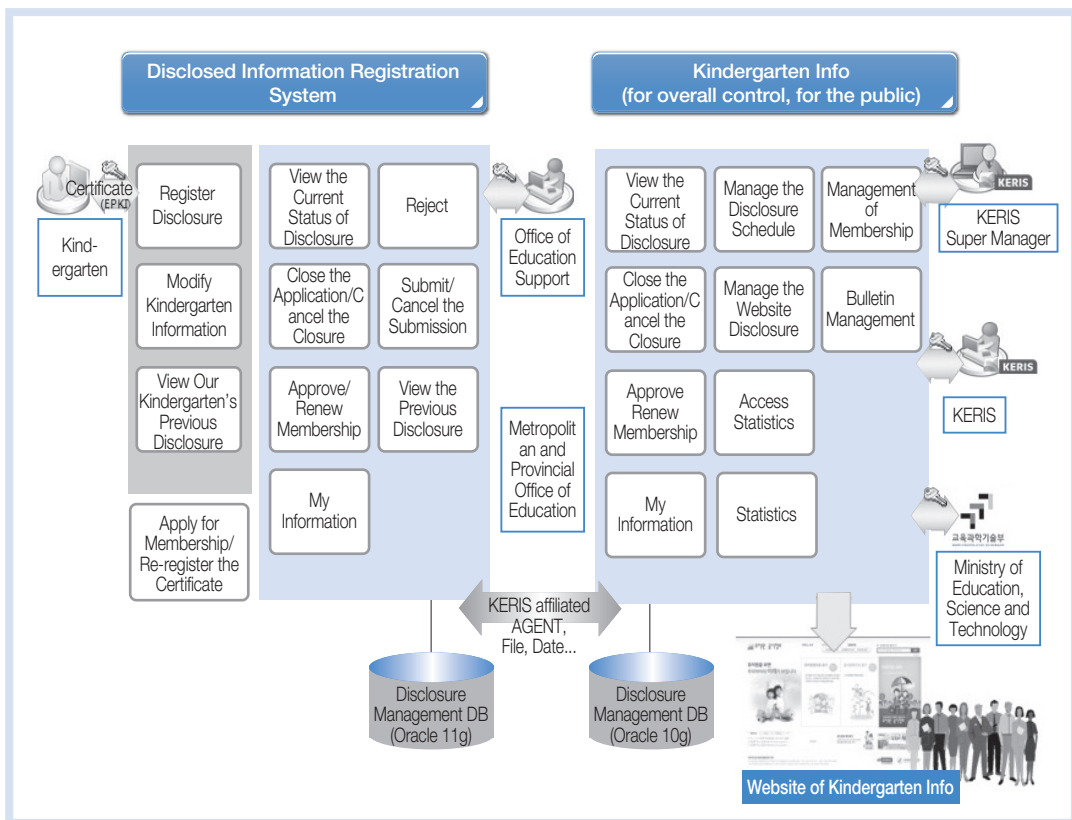
The project for ICT in infant education has carried out 'the introduction of a kindergarten information disclosure system' and 'the establishment of a comprehensive information system' to foster future human resources and

address Korea's low birthrate problem. In March 2011, the e-Kindergarten was launched to offer digitalized services through the infant education support system. In 2012, the application software was upgraded via a contract of operation and maintenance of the e-Kindergarten, and user support was reinforced by adding more staff for a total of a monthly average of 12 counselors.

#### B. E-Kindergarten System & Kindergarten Tuition Support Procedure

In relation to kindergarten tuition support, parents of kindergarten students (from the age of three to five) who wanted tuition sup-

Figure 5. Conceptual Diagram of Kindergarten Information Disclosure System



※ Source : Ministry of Education, Science and Technology (2012)



port had to file an application at a residents' center and could get approval depending on their income and properties. Those whose income level fell in the lower 70 percent income bracket received kindergarten tuition support until 2011. In 2012, the government introduced the 'Nuri' program to provide free kindergarten for all five-year-olds regardless of their parents' income.

In addition, the 'Kindergarten Info' Service was established and started its service. All kindergartens are obliged to open their information to the public. The enforcement decree of the Special Act Information Disclosure of Academic Institutions was amended on April 20, 2012, which specifies

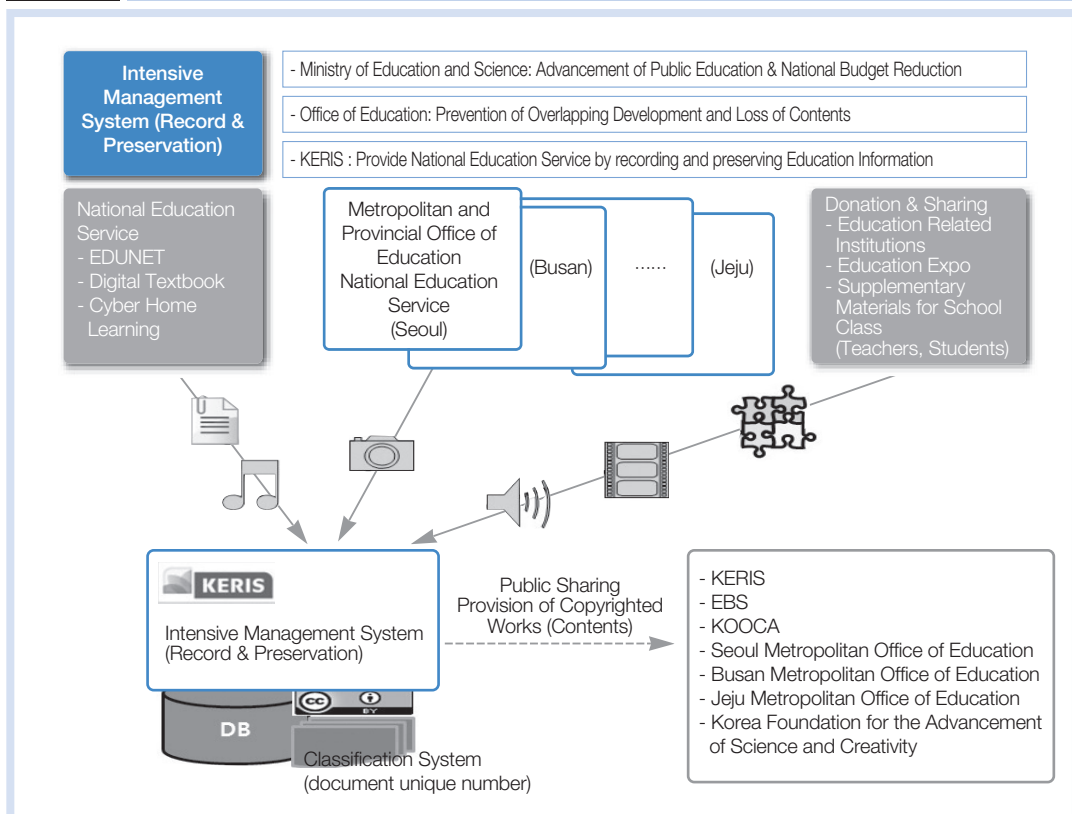
the detailed scale, frequency, and time of information disclosure. According to the 'Kindergarten Info Service,' the first disclosure of kindergarten information took place in September 2012.

## 2. National Teaching-Learning Center - EDUNET

### A. Outline of National Teaching-Learning Center

EDUNET was launched as a comprehensive education information service system at an early stage of Internet penetration in 1996 and has played a pivotal role as a medium

Figure 6. Schematic Diagram of Intensive Management System



between education policies and schools. In particular, after the government established the comprehensive measure for the e-learning support system in 2004, the role of EDUNET as a national teaching-learning center has been changed and expanded.

### B. Status of EDUNET Use and Content Service

As of 2012, the EDUNET membership reached 6.36 million. The monthly average number of visitors is about 1.03 million as of December 2012 and the monthly average number of page views amounts to 30 million. EDUNET is trying to secure more contents from education offices, public institutions and private enterprises to offer quality service. As of part of that effort, it has held

the education sharing expo and has been pursuing MOUs with companies in 2012 to obtain more content.

The Ministry of Education, Science and Technology held the Korea Donation for Education Expo (March 16-18, 2012, Exposition Center 2, Ilsan KINTEX) to create a donation and sharing culture for education. Many broadcasting companies and public institutions that produce and possess various quality content participated in the event.

### C. Operation of Educational Information Sharing System

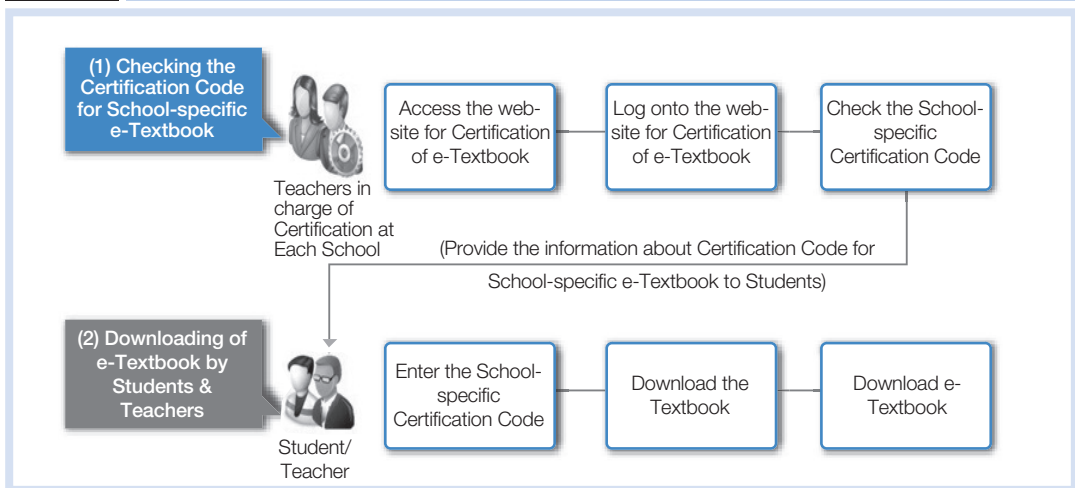
The Ministry of Education, Science and Technology established an educational information sharing system through which the central agency and the metropolitan and

**Table 12. Status of EDUNET Subscribers by Year(as of October 2012)**

Year	2006	2007	2008	2009	2010	2011	2012
No. of Subscribers (total)	5.53 million persons	5.70 million persons	5.84 million persons	6.06 million persons	6.17 million persons	6.30 million persons	6.36 million persons

※ Source : EDUNET Members' Database

**Figure 7. Conceptual Diagram of Kindergarten Information Disclosure System**



provincial offices of education share their educational contents to prevent overlapping development at a national level. This laid the foundation for the joint utilization and management of various quality contents and has maximized consumers' satisfaction by offering a great deal of quality educational information.

The educational information sharing service adopted an educational information metadata called 'KS X 7001,' which was established based on the Korea Standard Certification. This is also known as the Korea Education Metadata in the education sector.

#### **D. E-Graduation Alum for Small-sized Schools**

EDUNET offers not only teaching-learning resources but also services to bridge educational divides, which include its most well-known e-Graduation Alum. The number of schools that have less than 30 students account for 26% of all schools (3,007 schools). These schools had to pay relatively higher for their graduation albums and even had difficulty making one in the first place, due to their limited numbers of students. To help these small schools, the Korea Education and Research Service selected 828 schools to offer free support for making graduation albums for graduates (8,514 books).

#### **E. Online Transmission of e-Textbook and Affiliated Service**

EDUNET started the transmission of e-textbooks and its services affiliated services in the latter half of 2012. The contents of

EDUNET are linked to e-textbook 3.0 and its website (<http://book.edunet.net>) to help users find supplementary multimedia resources easily and quickly.

### **3. Cyber Home Learning System**

#### **A. Outline of Cyber Home Learning System**

The Cyber Home Learning System (CHLS) was launched in 2004 and is being promoted to provide students with supplementary learning contents to study voluntarily at home through the Internet, to reduce the cost of private education, and to eliminate educational divides. In 2012, it carried out a trial campaign such the real-time 'Saturday Mentoring Service' (Busan, Gangwon, Chungnam, Gyeongbuk) through a teleconference counseling system, developed the revised curricula (middle school grade 1-3: Science/Technology & Home Economics, contents for students: basic and key points), expanded the content management and distribution system to more cities and provinces (Incheon, Ulsan, Chungnam, Jeonnam, Jeju), and improved the function of the cyber home learning statistics system.

#### **B. Use of Cyber Home Learning**

Those students who want the cyber home learning can use it for free after they sign up for a membership at one of the websites for cyber home learning run by their metropolitan or provincial office of education. Students can choose between 'class assignment type' and a 'self-learning type of online class.'

### C. Contents of Cyber Home Learning

Since the launch of the cyber home learn-

Region	Name	Website Address
Seoul	Seoul Kkulmatdotcom	www.kkulmat.com
Busan	Busan Cyberschool	cyber.busanedu.net
Daegu	Daegu e-Study	estudy.dgedu.net
Incheon	Incheon e-School	cyber.edu-i.org
Gwangju	Gwangju BitGoweulsaem	cyber.gedu.net
Daejeon	Edurang	www.edurang.net
Ulsan	Ulsan Cyber Home Learning	home.go.kr
Gyeonggi	Gyeonggi Danopy	danopy.kerinet.re.kr
Gangwon	Gangwon Eduworld	ngcc.gweduone.net
Chungbuk	e-Star Chungbuk	star.cbbedu.net.or.kr
Chungnam	Chungnam e-Education	sso.cise.or.kr
Jeonbuk	Jeonbuk e-School	eschool.jbedu.kr
Jeonnam	Jeonnam Cyber Home Learning	cyber.jnei.or.kr
Gyeongbuk	Gyeongbuk My Friend Education Net	www.gyo6.net
Gyeongnam	Gyeongnam Saemihakseup	lms.gnedu.net
Jeju	Jeju e-Study	jejestudy.net

ing system, many efforts have been made to gradually expand the service to all schools and grades. In 2007, it developed the customized content for primary school grades 4-6, middle school grades 1-3, and high school grade 1. In 2012, the contents for science/technology and home economics for middle school grades 1-3 were produced to prepare for the introduction of an intensive completion course and were planned to be served in 2013

### D. Diversification of Service

The key function of cyber home learning is a two-channel line of communication between learners and cyber teachers. In 2012, four metropolitan and provincial offices of education including Busan, Gangwon, Chungnam and Gyeongbu started their real-time 'Saturday Mentoring' service through a teleconference counseling system in order to support the 5-day school system.

Table 14. Status of Nationwide Cyber Home Learning (as of July 2012)

Classification	No. of Student Members	Class Allocation Type		Self-Study No. of Students	Daily Logins
		No. of Classes	No. of Students		
Aug. 2005	769,840	1,987	42,100	727,740	54,142
Aug. 2006	1,608,997	3,999	178,705	1,430,292	107,787
Aug. 2007	2,903,635	28,821	511,721	2,391,914	187,743
Aug. 2008	3,089,303	53,625	1,022,866	2,066,437	304,236
Aug. 2009	3,119,924	46,882	1,339,080	1,780,844	362,313
Aug. 2010	2,918,025	74,194	1,324,765	1,593,260	329,697
Jul. 2011	4,166,719	67,356	1,071,836	738,450	228,150
Jul. 2012	4,477,108	48,108	696,934	281,832	156,013

※ The recipients of home learning have been limited to students from grade 4 of primary school to grade 3 of middle school since 2011 (excluding high school students).

※ The statistical data have been established by using nationwide statistics systems established by the KERIS (except for some cities and provinces) since 2011, and the same the same criteria have been used by metropolitan cities and provinces. (Overlapping log-ins were excluded. The number of students who actually participated in self-study was added up.)

### E. Outcome of Cyber Home Learning

The number of cyber home learning member students is on the rise, with a total 4,477,108 as of the first half of 2012, while the number of average daily log-ins reached a peak at 156,013 in 2009 but has slowly declined since then.

## 4. Operation of Creative Experience Activity Support System

### A. Outline and Basic Operational Direction

As creative experience activity that integrates existing extracurricular activities and creative discretionary activities was introduced into the 2009 revised educational courses, the Comprehensive Creative Experience Activity System ('Edupot') was constructed in order to enhance creativity, personality and career education.

The basic operational direction of Edupot

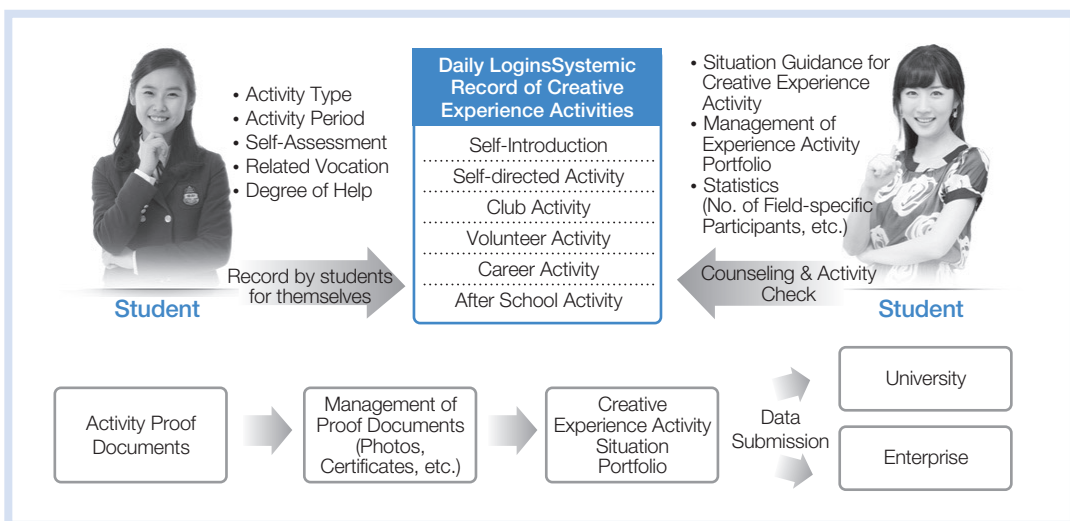
encourages students to voluntarily record their creative experience activities as well as manage the contents. Then teachers will check, approve or make up for what students write.

### B. Progress and Achievements

After promoting a project for “physical base construction and functional advancement of a comprehensive support system for creative experience activity” from July to December 2010, the system gradually expanded across the country from March to May 2011. Meanwhile, Edupot provides services such as self-introduction, autonomous activities, club activities, voluntary activities, career activities and after school activities, as illustrated below.

1,667,442 (87.3%) of students and 100,555 (90.9%) of teachers in secondary schools have joined the system while 1,872,583 (96.3%) of students and 127,784 (97.5%) of teachers in high schools have joined the system.

Figure 8. Diagram of EDUPOT's Major Service



## 5. Operation of Reading Education Support System

### A. Outline and Project Promotion in 2012

In order to improve the capacity of students for self-motivated learning, the School Library Utilization Plan has been promoted since 2003. The Reading Education Support System integrates the existing school library support functions such as book search, database construction, check-out and return, and reading accounts with reading activity management functions such as book report, letter writing, personal work collection and reading portfolio. Furthermore, construction of the system was completed in all 17 metropolitan and provincial offices of education in 2012, and its web vulnerability and web accessibility were improved for stable operation of the system.

The Busan Metropolitan Office of Education began to construct the system in 2010, and Gwangju constructed the system last in 2012. Now all 17 metropolitan and provincial offices of education are operating the Reading Education Support System and making efforts to encourage students to use the library as

well as promote reading education.

### B. Achievements

As of 2012, the number of DSL-registered schools has slightly increased to 11,109 from 11,059 in 2011. However, the number of registered students has dropped by 1.2% to 8,789,946 from 8,896,110 in 2011. The status of student' book report activities loaded on the Reading Education Support System is as per Table 16. Elementary school students had the highest number of uploads with 6,393,898 book reports, followed by middle school students with 2,032,600 book reports, and high school students with 1,341,009 book reports, which means an average of 1.2 book reports were loaded by each student.

## 6. EBS Internet Service

### A. Progress and Project Promotion in 2012

MEST announced its plan to reduce private education costs that aim to enhance the public education learning system by expanding EBS programs and Internet service in February 2004, and launched the EBS Internet Service

**Table 15.** Reading Education Support System's DLS Registered Schools and Students (as of April 2012, unit: schools, persons)

#### ■ Status by Year

Classification	Registered Schools				Registered Students			
	Primary	Middle	High	Sub Total	Primary	Middle	High	Sub Total
Nationwide (2012)	5,842	3,047	2,220	11,109	4,049,542	2,396,696	2,343,708	8,789,946

**Table 16.** Status of Students' Book Report Activity (unit: numbers of activities)

Classification	Primary School	Middle School	High School	Total
Total	6,393,898	2,032,600	1,341,009	9,767,507

**Table 17.** Status of EBS Lectures (unit: lectures/sessions)

Domain	2010		2011		2012	
	Lectures	No. of Sessions	Lectures	No. of Sessions	Lectures	No. of Sessions
Korean SAT	1,060	19,884	752	17,896	798	15,235
High School Grades	458	7,684	377	6,935	607	7,449
Essay	278	1,294	96	2,255	88	1,083
Sub Total	17,96	28,862	1,225	27,086	1,493	23,767

Program in April 2004. The EBS Internet Service aims to reduce private education costs as well as to ease the educational divide between regions or classes by providing lectures on subjects such as the university entrance exam through the EBS channels and website.

Furthermore, it was possible to secure a more systematic textbook management system and stabilize quality control of textbooks by building a web-based textbook development system in 2012.

### B. Improvement in EBS Internet Service

The EBS Internet Service provides 1,493 lectures and 23,767 contents on subjects such as the university entrance exam, school exam, and essay exam while making various efforts to improve the quality of lectures. It also quickly adapted itself to the new educational policy and environments by reflecting 2009 revised educational courses and launching new courses in preparation for the new university entrance exam that will be in effect from 2014.

### C. Various Services through EBSi

EBSi strengthens one-to-one customized service in order to provide prompt Q&A and counseling service to students who have questions regarding EBS lectures or textbooks. Learning Q&A counseling has increased from 921,774 in 2011 to 947,138 in 2012, and summer and winter school Q&A counseling has risen from 98,079 in 2011 to 103,152 in 2012. In particular, diagnostic evaluation service began in 2012 so that it could enhance one-to-one counseling services that recommend lectures to students based on their levels.

## 7. Air and Correspondence High School

Air and Correspondence High Schools (ACHS' s) were established in order to provide educational opportunities for those who have missed their school studies due to socio-economic situations. The schools also aim to enhance the overall education level of the nation by spreading and supporting the con-

**Table 18.** Age of Air and Correspondence High School Students(as of April 1, 2012) (unit: persons)

Classification	Teenagers	those in 20s	those in 30s	those in 40s	those in 50s	those in 60s	those in 70s	Total
No. of Students (Percentage: %)	2,789 (19.3%)	2,691 (18.6%)	1,660 (11.5%)	2,918 (20.2%)	3,536 (24.4%)	822 (5.7%)	64 (0.4%)	14,480

cept of life-long education.

### **A. Promotion Status**

As of 2012, there were 40 ACHS' s affiliated with public high schools across the country with enrollment of 14,480. The registered number of ACHS cyber education system members was 85,950 and the number of total users was 102,149. It also recorded 12,022,090 page views in 2012.

### **B. Achievements**

There are four major tasks that ACHS is pursuing; institutions related to ACHS shall be improved; operating and support system of school affairs shall be enhanced; teaching and learning media shall be diversified and strengthened; and the u-Learning system based on advanced ICT shall be established. The legal basis to establish the Air and Correspondence Middle School has been prepared by partially revising related rules and regulations to be effective as of November 6, 2012, including the 'Decree on Standards for the Establishment' (Presidential Decree No. 24157) and 'Enforcement Rules of Decree on Standards for the Establishment' (Ordinance of the Ministry of Education, Science and Technology NO. 162).

It is reasonable to look at school affair support system respectively for students and for teachers. Support for students includes comprehensive counseling service through various methods, and support for teachers includes on and offline ICT training aimed to enhance teachers' expertise. Particularly, support for diverse mobile media with mobile apps has been expanded by developing content for

video clip-based smart phones and IPTV as well as content for existing PCs.



## Infrastructure for ICT in Education

### 1. Infrastructure for ICT in Education for Elementary and Secondary Schools

#### A. Progress

Basic infrastructure was constructed so that elementary and secondary school students might utilize computers and the Internet. The ICT infrastructure at elementary and secondary schools had to go through three big changes. First of all, PCs were distributed and connected in every classroom. Then, the Internet network was upgraded with speeds of 500Mbps for better utilization of diverse devices such as multimedia platforms and IPTV. Thirdly, the security system was strengthened to vitalize the use of wired and wireless networks in preparation for smart education.

In an effort to advance learning environ-

ments at classrooms, every elementary school and secondary schools nationwide (around 11,000 schools) were connected to the Internet for the first time in the world at the end of 2000. As of 2011, 70% of schools were achieving Internet speeds of 100 Mbps or higher so that schools could utilize diverse materials in class.

Furthermore the overall environment for smart education has been improved, wired and wireless Internet connection has been expanded, and outdated computers have been replaced with cloud devices and security has also been heightened. In an effort to pursue safer cyber space, early detection and response to cyber threats and control system have been enhanced.

#### B. Promotion Status

MEST and the metropolitan and provincial offices of education have supplied computers while replacing out dated computers to support the development of creativity and problem-solving through e-learning lessons. As of the early 2012, 1.61 million computers, equivalent to 98.5%, with Pentium IV processors have been supplied, and 1.45 million

Table 19. Status of School Internet Speed by Year

Year	Classification	512K	2M	4~10M	10~40M	50~90M	100M~	Total
2011	No. of Schools	-	-	69	2,756	757	8551	12,133
	Percentage (%)	-	-	0.6%	22.7%	6.2%	70.5%	100

※ Ministry of Education, Science and Technology, 2001, 2006, 2011

Table 20. 2012 Status of PC Possession by Education Office (unit: pcs)

Classification	No. of Students	Currently used PCs				No. of Students per PC
		Total	Pentium3 and Lower	Pentium 4	Pentium 4 and Higher	
Total	6,745,961	1,630,277	24,400	580,352	1,025,525	4.14

※ Source: Education Statistics Research Center Korean Educational Development Institute, 2012  
\* All of schools' distributed PCs were included (for education or administrative purposes, etc.)

Table 21. 2012 Status of No. of Students per PC (unit:units)

Classification		Primary School	Middle School	High School	Special School	Total
Total	No. of PCs	611,221	338,579	484,333	14,579	1,448,712
	No. of Students	2,951,995	1,849,094	1,920,087	24,785	6,745,961
	No. of Students per PC	4.83	5.46	3.96	1.70	4.66

※ Source : Education Statistics Research Center Korean Educational Development Institute (2012)  
\*Educational PCs (for Students and Teachers)

computers, equivalent to 88.9%. Among them many are used for educational purposes by students and teachers and 1.8 million, equivalent to 11.1%, are used for administrative purposes. The Ministry recommends teachers to use portable notebooks or tablet PCs to make full use of supplied materials and to prepare for the ubiquitous educational environment.

1.45million computers are used for educational purposes in class and the ratio of students to PC is 4.7:1, which means schools have now enjoy an learning environment where about five students can share a PC. Specific students to PC ratios are as follows; 4.8:1 in elementary school; 5.5:1 in secondary school; 4.0:1 in high school; and 1.7:1 in special schools. Starting in 2013, wireless networks will be established in every school with

the aim of providing SMART education in earnest by 2015. As of March 2011, 70% of all schools were achieving Internet speeds of 100 Mbps or higher.

## 2. Operation of National e-Learning Quality Control Center

### A. Background and Progress

KERIS has been operating the Quality Certificate System for Educational Contents in order to achieve higher consumer satisfaction by guaranteeing the quality of content and encourage e-Learning suppliers to develop high quality content. In 2012, the total number of 3,774 contents underwent evaluation, and 2,773 among them passed the evaluation.

Table 22. Qualification Test Subjects for e-Learning Quality Manger

Classification		Text Subject	No. of Questions	Type	Time
First Round	Written Test	Basic of e-Learning & Service Planning	20	5 Multiple Choices	120 minutes
		Development of e-Learning Content	20		
		Construction of Infrastructure for e-Learning	20		
		Operation and Evaluation of e-Learning Service	20		
Second Round	Practical Test	Practical Operation of e-Learning Quality Management - Basics of e-Learning & Service Planning - Development of e-Learning Content - Infrastructure Construction for e-Learning - Operation and Evaluation of e-Learning Service	4	Essay	120 minutes

※ Only those who pass the first round are eligible for the second rounds of test of the year and the subsequent year.

ation, equivalent to 73.5 % of the total. In addition, groundwork for standardization of quality certificate system and procedure for smart education was made in 2012 by developing SMART education content quality certificate guidelines and carrying out research on smart education content distribution as well as quality control standards.

### B. Major Projects

In order to secure qualitative superiority of e-learning quality control, a system for nurturing quality control experts that cover the full process of e-learning including the introduction, planning, development, operation, and evaluation was developed. In order to establish an institutional foundation for creating competent e-learning manpower, the qualification certificate system for certified e-learning quality control engineers was put into operation.

### C. Current Status of e-Learning Quality Control

From 1998 to October 2012, a total of 3,

774 contents underwent rigorous evaluation, and among them, 2,773 passed the evaluation, which is equivalent to 73.5% of the total. From 1998 to October 2012, e-learning companies applied 1,823 kinds of content, 1,299 of which passed evaluation.

From 2003 to October 2012, distance education training institutes applied 1,764 kinds of content, 1,330 of which passed evaluation, equivalent to 75.4% of the total. From 2003 to November 2012, distance universities applied 187 kinds of content, 144 of which passed evaluation, equivalent to 77.0% of the total.

## 3. Standardization

### A. Outline and Organization for Promotion

There must be many factors behind successful ICT in educations such as well-established infrastructure, participation of competent teachers and active support from the government as well as the metropolitan and provincial offices of education. However, improvements in service quality such as efficiency

Table 23. Status of Professional Capability Development Courses for e-Learning Quality Mangers

Year	Operation of Education Courses				
	Course Grade	No. of Applicants	No. of participants	No. of Certificates issued	Completion Rate (%)
2008	Grade 1	30	20	20	100%
	Grade 2	60	24	24	100%
2009년	Grade 1	34	29	18	62.1%
	Grade 2	34	28	22	78.6%
2010년	Grade 2	82	30	29	96.7%
2011년	Common	66	66	66	100%
2012년	Common	96	69	69	100%
계	-	402	266	248	93.2%

and accessibility that achieved through standardization play a key role. Better educational contents and system can be developed if more time and funds are allocated to improve learning efficiency while repeated work is reduced during the process of contents development and distribution by standardizing education and academic research information.

Standardization, the process of developing mutual consent and standards, is achieved through various channels. There are international, national and group standards depending on its application scope and official status.

### B. Standardization Efforts

In a national standardization effort, 32 standards including common cartridge, learning tools interoperability, and question and test Interoperability have developed since 2008.

Open Digital Standardization Forum developed 4 standards including e-book format standards, e-book use standards. Three e-book standards among them were also enacted as TTA group standards.

KERIS has enacted 26 standards by operat-

ing a national standards development committee on document language and e-publishing since 2010. Standardization efforts for e-books have been made since 2011.

### C. International Standardization

ISO/IEC JTC 1/SC 34 titled as Document description and processing languages and International Digital Publishing Forum (IDPF) have led international standardization for digital publishing.

In Korea, the Korean Agency for Technology and Standards of the Ministry of Knowledge Economy is designated as a national body, and private sector experts participate in international plenary and working group meetings and carries out standards development projects through the agency.

International standards of e-learning have been discussed by five major organizations including ISO/IEC JTC 1 SC 36, the IMS Global Learning Consortium(GLC), ADL of the U.S. Defense Department, and the Learning Technology Standards Committee (LTSC) of IEEE and CEN, a European stan-

Table 24. Status of Electronic Publication Forums' Standardization Activities (2010~2012)

Number	Standardization (Draft) Name	Standardization Organization	Note (Standardization Number)
1	EPUB Open Packaging Format (OPF) 2.0 v1.0	ODPF, TTA	TTA.OT-10.0297
2	EPUB Open Publication Structure (OPS) 2.0 v1.0	ODPF, TTA	TTA.OT-10.0298
3	EPUB Open Container Format (OCF) 1.0	ODPF, TTA	TTA.OT-10.0299
4	Guideline for EPUB Content Work	ODPF, TTA	Underway (Forum Standardization is completed)
5	EPUB DRM Encryption	ODPF, TTA	Underway
6	EPUB DRM Electronic Signature	ODPF, TTA	Underway
7	EPUB DRM Certificate	ODPF, TTA	Underway
8	Terminology for EUP DRM Rights	ODPF, TTA	Underway
9	EPUB 3.0(5 types)	ODPF, TTA	Underway

dards development organization. As of August 2012, 30 standards have enacted while 33 standards are being developed.

## II. ICT in of Educational Administration and Finance

01

### Establishment and Operation of the National Education Information System

#### 1. Background

The National Education Information System (hereinafter after referred to a “NEIS”) is an education information system, which connects primary and secondary education institutions to enhance the efficiency of administrative affairs in schools. NEIS processes the administrative affairs of about 11,000 education related institutions including schools and related educations institutes, and handles 27 sectors of school affairs on the Internet.

In 2012, NEIS had to develop an additional service to support the national education policy due to a legislative change and improved the evaluation system to promote self-directed creativity and personal education in schools. NEIS also added an information disclosure service for private teaching institutes and extracurricular lessons due to the recent amendment to ‘the Act of the Establishment and Operation of Private Teaching Institutes and Extracurricular Lessons.’

#### 2. Progress

The NEIS project, with the aim to overcome the limits of the existing SIS and SIMS and build an integrated information management system, carried out the BPR/ISP in September 2000, which was completed in October 2002 and started its service in general administrative affairs in November 2002 and in school administrative affairs services in March 2003. In 2012, the school affairs system has been developed for talented schools and overseas Korean schools, which could not use NEIS due to their unique characteristics. The system was completed in July and began to test-operate from October.

#### 3. 2012 Major Projects

##### A. Teachers’ Administrative Affairs and School Administration

- Application of Achievement Test, Development of NEIS
- Establishment of the School Affairs System for Overseas Korean Schools
- Development of the School Affairs System for Gifted and Talented Schools
- Operation of Online Service to offer University Entrance Exam Information
- Additional Development of Sharing Portals and User’ Customized Services

Table 25. Types of Civil Affair Document Issuance Services of NEIC

Classification		Types of Documents and Certificates
Students (10 types)	Korean (8types)	Diploma Certificate (Primary/Middle/High School)☞, Certificate of Previous Enrollment (Primary/Middle/High School ☞), Certificate of Academic Record (Middle/High School☞), Transcript of Student Record (Primary/Middle/High School☞), Certificate of Prospective Graduation (Primary/Middle/High School), Certificate of Enrollment (Primary/Middle/High School), Education Fee Receipt, Supernumerary Student Management
	English (2types)	Diploma Certificate (Primary/Middle/High School), Certificate of Enrollment (Primary/Middle/High School)
GED (General Equivalency Diploma) (7 types)	Korean (5types)	GED Certificate of Achievement☞, Certificate of Test Scores☞, Certificate of Subject Passage (for all)☞ Reissuance of GED Certificate of Achievement, Certificate of Subject Passage
	English (2types)	GED Certificate of Achievement (High School Equivalency Acceptance, High School Equivalency Diploma), Certificate of Test Scores (High School Equivalency Acceptance, High School Equivalency Diploma)
HR Mgmt. (6 types)	Korean (6types)	Certificate of Employment☞, Certificate of Career☞, Certificate of Retirement☞, Certificate of Prospective Retirement☞, Proof of Award Acceptance☞, Proof of Training Completion☞
Lifelong Education (9 types)	Korean (9types)	Proof of Operator of Private Educational Institute, Proof of Temporary Closure of Private Educational Institute, Proof of Closedown of Private Educational Institute, Proof of Operation of Private Educational Institute, Proof of Instructor of Private Educational Institute, Proof of Change of the Founder of Private Educational Institute

※ ☞ : means that the concerned documents can be issued (or printed) online.

## B. General Administration

- Establishment of Error Verification System for Stability of the NEIS and Distribution System
- Upgrade of NEIS in tune with the amendment to the law on Private Teaching Institutions.

## C. Services for Students and Parents and Civil Service

14 educational certificates and proofs including student' graduation certificate can be obtained at unmanned civil service document issuing machines across the country. Parents can now get 57 kinds of education-related information services including curriculum, test scores, academic achievement and education resources for better guidance of their children. Students can see 48 types of personal information related to their school

lives. A variety of policies have been developed as part of education policy support, which includes the services offered to students, including the 'Teachers' Capacity Developing Evaluation System, the 'Statistics on the Vulnerable' and 'School Violence Survey.'

## D. Operation of Infrastructure and Reinforcement of Personal Information Protection and Security

KERIS, the umbrella organization of NEIS, and 16 metropolitan and provincial offices of education completed the application of new IT technologies such as virtualization and dynamic allocation in February 2011 and upgraded the performance of the system in the first half of 2012, to ensure more stable operation. In addition, the information protection consulting was carried out from November 2011 to

February 2012, to reinforce the security of the next-generation NEIS.

### E. Sejong Special Self-Governing City Office of Education' s Administration and Finance Establishment of the Information System and Support for Users

As Sejong Special Self Governing City was launched on July 1, 2012, it supported the city's newly opened office of education to conduct administrative and financial affairs for schools in its jurisdiction. Meanwhile, more efforts were made in relation to the operation of the NEIS on-site consulting committee and user-' integrated support center and the development of remote training contents.

### F. Support for Users

To help the next generation NEIS to take root at schools and be revitalized, the NEIS on-site counseling committee, and integrated support centers for users are being operating and contents for remote trainings were produced and distributed.

Table 26.

Operation Status of NEIS Central Counseling Center

Classification	Calls received	Calls responded	Response Success Rate
Jan. 2012	2,355	1,291	54.82%
Feb. 2012	3,794	2,582	68.05%
Mar. 2012	1,721	1,654	96.11%
Apr. 2012	2,345	2,190	93.39%
May 2012	4,250	2,689	63.27%
Jun. 2012	973	959	98.60%
Jul. 2012	1,292	1,282	99.20%
Total	16,730	12,647	75.59%



## Establishment and Operation of the Integrated System for Administrative and Financial Affairs of Regional Education

### 1. Outline

In order to build the foundation for autonomy and decentralization and a performance-oriented and advanced finance structure, the government took it as its national tasks to innovate the national budget and accounting system and to establish the integrated finance information system in 2004. To this end, the MEST started to develop the Integrated System for Administrative and Financial Affairs of Regional Education (hereinafter referred to as “EDUFINE”) in February 2005. The MEST completed the establishment of the 6 sectors, 16 systems and 55 unit businesses of EDUFINE and opened the first 25 unit business services on January 1, 2008, before it started its service in earnest. In June 2012, for the introduction of the gender awareness and performance-based budget system, EDUFINE embarked on revamping its services. The gender awareness budget will be introduced starting from 2013, while the performance-orient-

ed budget compilation will be test-run in 2013.

### 2. Progress & Achievements

EDUFINE offered 1,962 cases of trouble and technical assistance in relation to the maintenance and repair of the physical infrastructure and serviced 1,954 cases of regular maintenance, while 304 personnel participated in the operators’ training program. As the efficiency of the database servers’ central processors, memories and disk use has substantially improved due to the analysis and improvement of the EDUFINE system, users’ experienced response time was reduced. The system prevents performance degradation and troubles in advance by checking the resource consumption and dualization. As a result of its effort to expand the electronic finance transaction service, the online payment and receipt transactions reached 8,361,478 (the equivalent of KRW 2,878.8 billion), which is up 52% compared to 5,488,667 in 2011. EDUFINE will bring greater effects soon. It is expected to enhance the efficiency of work thanks to the establishment of an advanced finance system based on the partnership between EDUFINE, the finance transaction service and financial institutions, and to save 11.4 billion won in administrative affairs expenses.

Table 27. 2012 Service Operation Results of School Accounting-Electronic Funds Transfer (EFT)

Year	Batch Receipt	Batch Payment	Real-time Payment		Giro Payment		Name of Account Holder	No. of Serviced Institutions (Total)
	School Banking (cases)	Return of erroneous payment (cases)	No. of Cases	Total Amount (KRW 100 million)	No. of Cases	Total Amount (KRW 100 million)	No. of Cases completed	
2010	116,111	9,496	670,282	3,238	1,741	5.3	558,517	4,067
2011	449,451	51,732	3,648,531	17,992	9,866	32	1,329,087	5,970
2012	545,796	71,631	6,292,304	28,788	10,958	38	1,440,789	6,717

## Operation of the Education Information Disclosure System

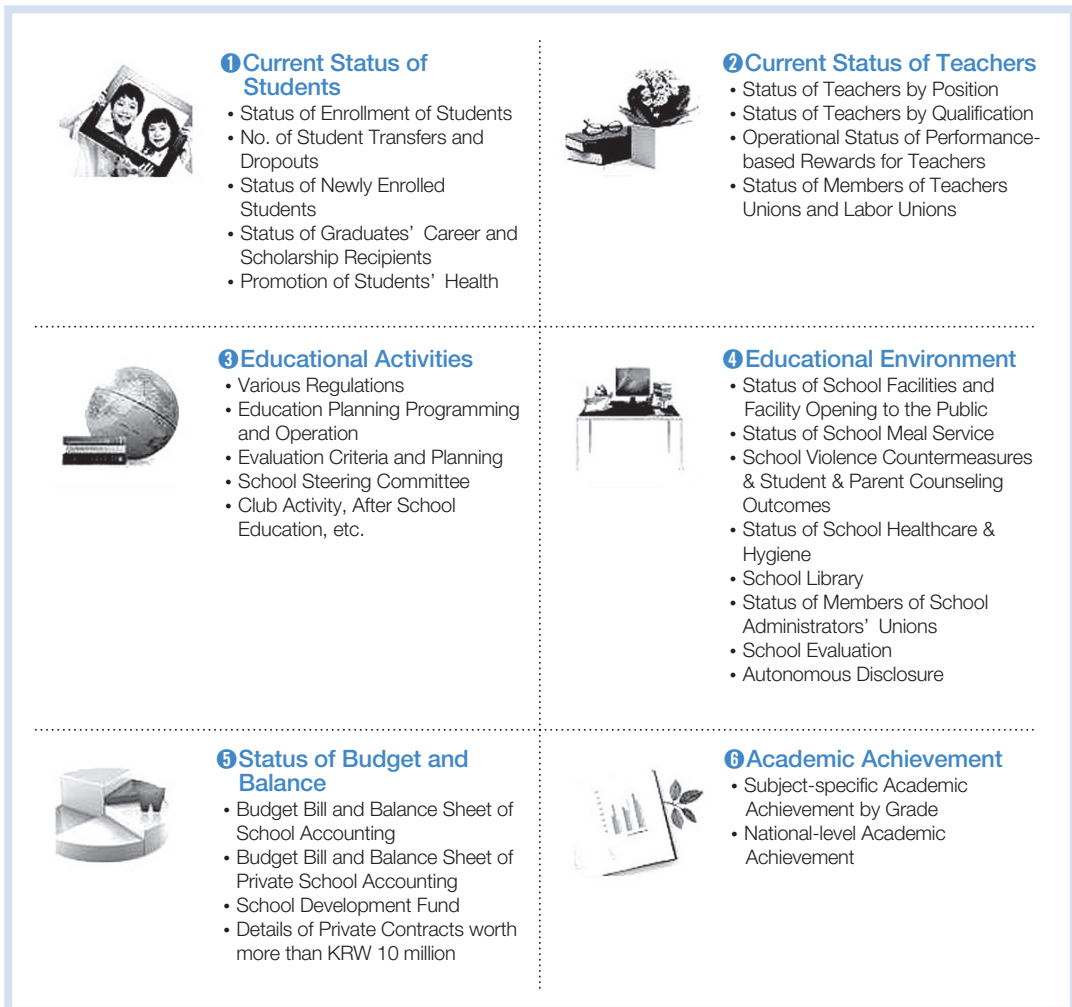
### 1. Establishment and Operation of the Information Disclosure System for Primary, Middle and High Schools

#### A. Concept of School Information Disclosure

##### Disclosure

The School Information Disclosure System makes public the overall educational activities in schools through the Internet in an objective and transparent manner, which in turn guarantees people's rights to know and improves the quality of education. The School Information Disclosure System is run by MEST, the overall management institute, the metropolitan, provincial, and district offices of education,

Figure 9. Examples of School Info



and the unit schools. People can find the disclosed school information that has been collected since December 2008 at the website of each school or the portal site of the School Information Disclosure System ([www.schoolinfo.go.kr](http://www.schoolinfo.go.kr)).

### **B. Promotion Organization & Contents of the School Information Disclosure System**

According to the exemption law of the Information Disclosure of Educational Institutes, the primary agency responsible for disclosure are the heads of an elementary or secondary educational institutes, who should disclose education information possessed and managed by the school at least once a year. As of April 2012, about 11,969 primary and secondary schools are subject to the law. The items, institute, and schedule of such disclosures are prescribed in the exemption law of the Education Information Disclosure and its enforcement. The heads of schools have to open information on 15 disclosure items including the school ordinance and regulation on school operating rules and 47 disclosure ranges, on a regular basis more than once every year (Feb, Apr, Mar, Sep, Nov), through the 'School-Info' website([www.schoolinfo.go.kr](http://www.schoolinfo.go.kr)) or the school's website.

## **2. Operation of the University Information Disclosure System**

### **A. Outline**

The university information disclosure system aims to guarantee the public's right to

know, to provide students and parents with useful information for selecting universities, to enhance the transparency and responsibility of universities, and to provide government policy makers with university information for reasonable decision making. Each university has to disclose items including education environment and achievements on its website or the "University-Info" website ([www.academyinfo.go.kr](http://www.academyinfo.go.kr)).

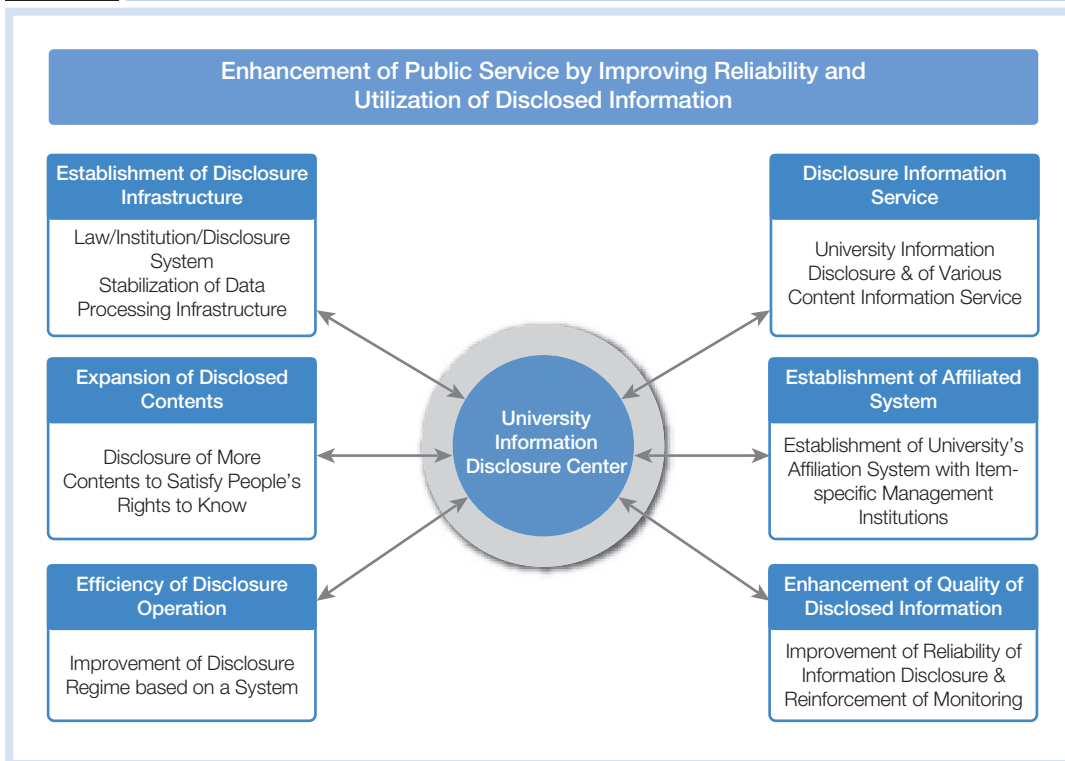
### **B. Enhancement of Reliability of the University Information Disclosure System**

The University Information Disclosure System plans to operate an external monitoring team in the first and second half of the year to ensure the reliability of disclosure within 2012. It will install a notice banner to inform on the status of modifications of incorrect information and encourage actual information consumers to participate in the monitoring activity. It will run banners and pop-ups linked to the false and exaggerated advertisement report center banners and pop-ups to make an announcement.

### **C. University Self-Evaluation, Evaluation Certification, and Information Disclosure Relations and Efficiency**

Universities' in-house assessments and their information submitted for the accreditation of the higher educational institutions are gathered and used as a basis of the evaluation. In 2012, to ensure more stable operation of the university information disclosure, 48 universities were designated as test-run institutes. Meanwhile, to help better understand and

**Figure 10.** 2012 Project Objective of University Information Disclosure



raise the global status of Korean universities, the English version website of 'University Info' was launched on October 5, 2011, while the Chinese website was established on March 7, 2012.

## Establishment and Operation of the EduData System

### 1. Concept of the EduData System

The 'EduData System' serves to mutually link and integrate education-related databases which are collected, controlled, and supplied by the government and educational institutes,

and to supply them to policy makers for reasonable decision making and to administrators and researchers for state affairs or academic research.

The Ministry of Education, Science and Technology (MEST) actively cooperated together with the Korea Education Research Information Service (KERIS), the Korea Education Development Institute (KEDI), the Korea Institute for Curriculum and Evaluation (KICE), and other education-related institutions to collect, link and offer education data.

Table 28. Status of Data provided by EduData System (EDS) (as of October 2012)

Classification		Institution	No. of Types	No. of Items	Date of Data Submission
Elementary and Secondary Education	School Info Disclosure (2008-2011)	Korea Education and Research Information Service	62	847	Apr. 2012
	Elementary and Secondary Education Statistics (2009-2011)	Korean Educational Development Institute	115	3,013	
	NEIS (March 2011~September 2012)	Korea Education and Research Information Service, Metropolitan and Provincial Office of Education	255	4,133	
	EduFine (2009-2011)	Korea Education and Research Information Service, Metropolitan and Provincial Office of Education	72	1,250	
	Special Education Statistics (2011)	Special Education Department under Ministry of Education, Science and Technology	40	400	
	Scholastic Ability Test (2009-2011)	Korea Institute for Curriculum and Evaluation	6	288	
	National-level Academic Achievement (2009~2011)	Korea Institute for Curriculum and Evaluation	10	247	
Total			560	10,178	
Higher Education	Higher Education Statistics (2009-2011)	Korean Educational Development Institute	131	2,055	Oct. 2012
	Employment Education Statistics (2009-2011)	Korean Educational Development Institute	3	106	
	Lifelong Education Statistics (2009-2011)	Korean Educational Development Institute	8	158	
	University Information Disclosure (2009-2011)	Korea Council for University Education	172	1,863	
Sub Total			314	4,155	
Total			874	14,360	

As a result, the MEST opened the EduData System in 16 metropolitan and provincial offices of education on April 2, 2012, which allows users to use education data at one stop. On April 30, 2012, the ministry started the EduData Service, which enables ordinary researchers to use education data for academic and research purposes.

## 2. Progress

### A. Establishment of the Educational Data System (EDS)

The plan for the establishment of the Educational Data System was set up to build and information system which collects, connects and manages education related data and to construct a data warehouse (DW) to help users efficiently use it for policy or decision making.

### B. Operation of EduData Service (EDSS)

One of the major services of the EduData System is to provide academic researchers and policy makers with basic data sets they require. Starting from April 2012, the EDSS allows researchers to use educational statistics, school information, disclosure information, scholastic aptitude test practice questions, special education related statistics, etc. for academic and research purposes.

## Establishment and Operation of Educational Administration System for Metropolitan & Provincial Offices of Education

The Administration Management System for Metropolitan & Provincial Offices of Education is designed to enhance work efficiency by integrating all user transaction functions with an easy exchange of documents between MEST and education offices and between the education offices and schools. It also reduces the workloads of teachers and improves the productivity, convenience, and document management of the educational administration by electronically managing all working processes from production and settlement to circulation (receipt/submission) of documents.

The educational administration system was established in city and provincial offices of

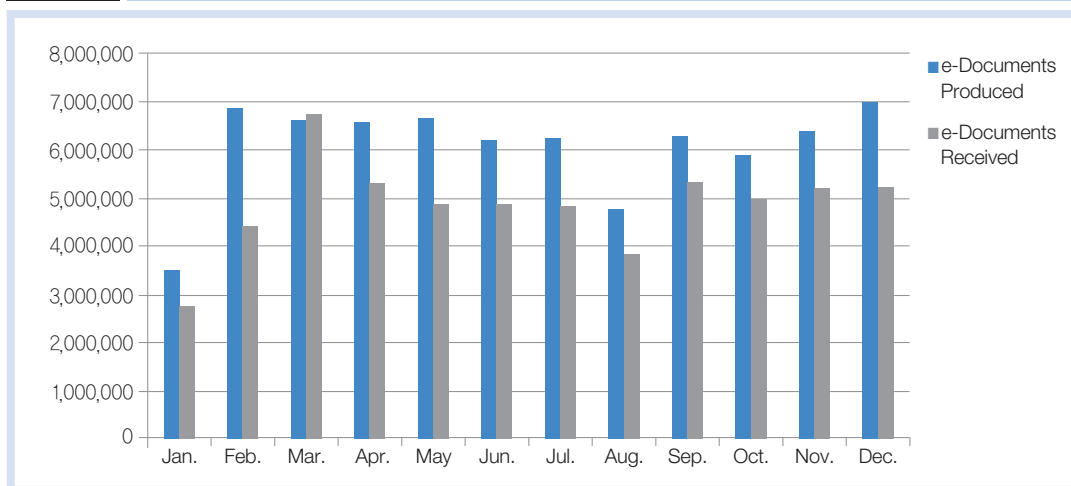
education and its test-run was completed from February to December 2010. It started its nationwide service on January 1, 2011.

An average of 6,032,508 documents were produced and received every month in 2012. The percentage of documents settled in affiliation with EDUFINE reached 53.2% in the metropolitan and provincial offices of education and 73.7% in schools, which show a high settlement rate by EDUFINE.

The steering committee of the educational administration system consists of MEST and the consultative body of the metropolitan and provincial offices of education, both of which are in charge of the overall management. The Korea Education Research Information Service operated the overall management center and the metropolitan and provincial offices of education established their own in-house operation plan and counseling center.

This contributes to relieving inconvenience of an electronic document system, through which teachers could only receive and send documents. All settlement process previously

Figure 11. 2012 Status of Production and Reception of Electronic Documents



done by separate systems including the NEIS and EDUFINE were integrated into a single channel, which makes document effective and relives workloads due to overlapping settlement at the same time. The replacement of a face-to-face settlement with an electronic one contributes to reducing work process time and especially enhancing convenience of teachers who work at branch schools or other special locations.





### III. ICT in Higher Education

01

#### Support for ICT in Universities

##### 1. Establishment and Operation of Infrastructure for ICT in Universities

###### A. Outline

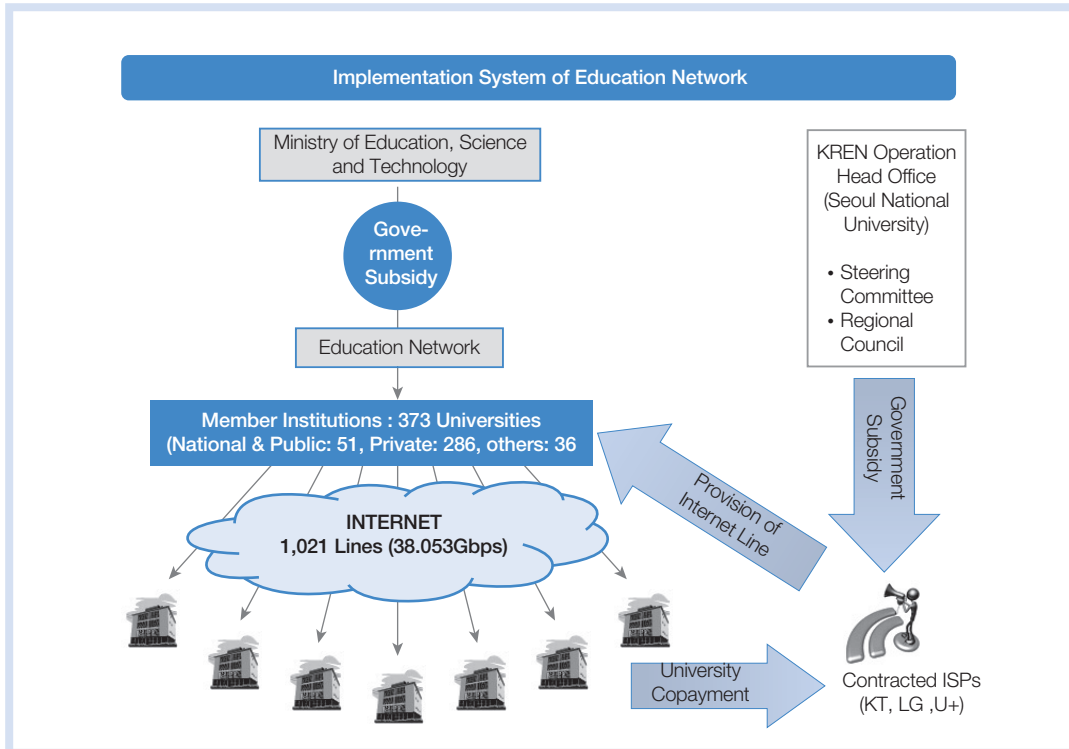
The Ministry of Education, Science and Technology subsidizes education networks to secure the next generation of ICT infrastruc-

ture and quality of educational services at universities for international competitiveness in higher education, supports content development of the National E-Learning Support Center, supports Korea Open Courseware (KOCW), and conducts research for the vitalization of ICT in universities and projects for vitalization of ICT in universities for establishing and spreading a standard model.

###### B. Progress

The physical network of the Korea Edu-

Figure 12. Implementation System of Education Network



cation Network (KREN) was launched and started its service in May 1991. In 2009, the dual (2) contractor selection was replaced with a multi (2-4) one to strengthen the support for consumer-centered services that use a commercially available network for a wider range of selections for universities. As a result, the KREN could save up to KRW 163.3 billion compared to other commercial networks as of 2012. It offers a more affordable Internet service than other domestic communication services thanks to the joint purchase based on the consultative body of large universities and the open bidding system.

In 2012, it enhanced the efficiency of the network traffic, strengthened the security, and started a total of 19 additional services. As of 2012, the Internet services for 373 universities

and educational institutes nationwide are provided via the Korea Education Network.

### C. Support for University's Development of E-Learning Contents

The University E-Learning Support Center was established in ten regions nationwide from 2003 to 2007 to secure e-learning infrastructure and to construct mutual cooperation and a joint utilization system among universities in the region. The regional center is an organization consisting of facilities, equipment, technology, and manpower to secure e-learning infrastructure and technology, and to provide universities in that region with necessary support services for joint planning, production, utilization, and e-learning content. The total subsidy to ten regional centers

Table 29. Status of Regional Center Construction & Content Development(unit: pcs)

Year	Region	Regional Center	No. of those Contents that have been developed with government subsidy									Total
			'03-'04	'05	'06	'07	'08	'09	'10	'11	'12	
2003	Jeju	Jeju University	8	6	10	12	7	7	4	3	3	57
2004	Busan, Ulsan & Gyeongnam	Gyeongsang University	10	7	23	15	0	6	4	2	3	67
2005	Gangwon	Gangwon University		6	9	7	4	7	5	3	2	41
	Gwangju & Jeonnam	Jeonnam University		27	5	6	6	4	3	3	4	54
	Daegu & Gyeongbuk	Yeungnam University		8	13	15	12	11	12	6	7	77
2006	Jeonbuk	Jeonbuk University			21	16	4	3	3	2	1	49
	Chungbuk	Cheongju University			23	6	5	5	4	5	2	48
2007	Daejeon & Chungnam	Chungnam University				2	5	4	10	10	7	31
	Seoul	Hanyang University				5	2	4	3	2	1	16
	Incheon & Gyeonggi	Inha University				5	4	4	5	4	2	22
Total			18	54	104	89	49	55	53	40	32	494

nationwide from 2003 to 2011 was 13 billion won, which was used to develop and use 494 contents. As of the first semester of 2012, it has 997 lectures with 131,682 attendees, 46 lifelong education lectures for local residents with 1,230 users, and 3,019 lectures for those in military service, which used by 9,299 people. In addition, it is mounted with the state-funded Korea Open CourseWare (KOCE), which ordinary citizens can use for free. In 2012, it is developing about 32 contents. After operating them in 2013, it will improve or supplement the contents before being service in the KOCW.

## 2. Establishment of the Joint Utilization System of University' Teaching-Learning Resources

### A. Background & Progress

With the aim to realize an open campus with the world's best digital environment that fosters globalized human resources, it undertook the research for the second stage of comprehensive measures for ICT in universities called, 'U-Campus Vision 2013' in 2008. The ICT in universities is classified into 4 categories such as infrastructure, contents, service, and culture. Its five core tasks are to establish

the world's most advanced model for ICT in university, to establish and operate a 'national e-learning center,' to manage learning history through a lifelong e-portfolio, to establish a Korean style of EDUCAUSE, and to build a university IT joint service center. The e-learning in higher education has been suggested as a core strategy to reinforce the nation's knowledge information capacity.

### B. Current Status and Contents

The Korea Education and Research Information Service has constructed and is operating Korea Open Course Ware (KOCW: <http://www.kocw.net>) with open courses and reference services at universities. They're expanding opportunities for higher education on a national level and improving the educational competitiveness of universities by making valuable university courses available on the Internet. In June 2010, the KOCW access application for all kinds of smart-phones was developed. In 2011, it developed its application for Tablet PCs and other digital media as part of its effort to respond to the rapidly changing knowledge acquisition behavior of the digital era.

Meanwhile, as of August 2012, it has jointly utilized about 1,200 lecture contents provided by 28 universities including Seoul

Table 30. Outcome of University Information Disclosure & University Open Lecture

Year	No. of Institutions	Video Lectures	Lecture on Teaching Materials	Total Number of Open Instructions
2011	83	535	220	12,094
2012	101	722	357	16,586

※ Source: Korea Education and Research Information Service. 2012

※ 3) Connexions: This is a platform developed and distributed by the U.S.' Rice University to disclose education materials for public use.  
 ※ 4) <http://www.academyinfo.go.kr/introAction.do>

National University and Yonsei University, and the number of contents are gradually increasing.

The KOCW's progress by year consists of three stages. First, the establishment stage (until 2009) created the KOCW website to enable the joint utilization of universities' lecture contents. Second, the implementation stage (2010) enhanced universities' participation, secured more quality lecture contents, and diversified public service channels. Finally, the stabilization stage (2011 to the present) of the joint utilization system will diversity themes and depths of contents with not only universities' lecture contents but with premium lectures related to higher education and establish a consultative body to settle a voluntary open lecture culture in universities.

During the stabilization stage, KOCW started its video streaming service in November 2011 for a premium lecture program titled the 'World Humanities Forum 2011' to jointly utilize higher education contents with a variety of themes and depths. The automatic collection system of metadata about universities' lectures was also established.

## Status of Distance Universities

### 1. Cyber University and its Special Graduate School

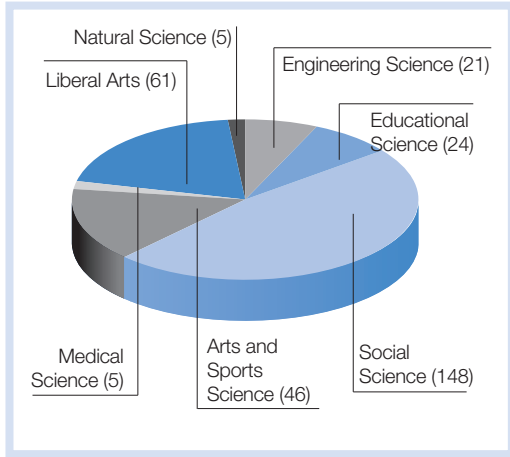
#### A. Outline of Cyber University

As of February 2012, there exist three kinds of distance universities in Korea : National Open Universities, cyber universities, and lifelong education institutes. Since its foundation in 2001, Korea’s distance universities have maintained an affordable level of tuition with 60,000 to 80,000 won per credit, which is about 1/3 of that of a private university. As of June 2012, there are 19 licensed and operational cyber universities authorized under the higher education law and two lifelong education facilities in the form of distance universities under the Lifelong Education Law. Among 21 distance universities, 18 universities offer 4 year bachelor’s degree courses and seven of them have 13 special graduate schools. The other 3 distance universities have 2-year junior bachelor’s degree courses.

Table 31. Status of Cyber University & Students by Year

Year classification	2010	2011	2012
No. of Cyber Universities	19	20	21
No. of Admissions	29,690	31,723	33,572
No. of Newly Enrolled Students (Registration Rate)	24,235 (81.6%)	26,250 (82.7%)	25,448 (75.8%)

Figure 13. Number of Majors per College of Cyber University (as of 2012)



#### B. Status of Operation

As of 2012, there are 10 distance universities in Seoul, 2 in Busan and Gyeonggi, 1 in Daegu, Daejeon, Gyeongbuk, Chungnam and Jeonbuk, and more than 50% of them are concentrated in the Seoul metropolitan area. There were 310 departments at 21 cyber universities. There are 148 departments in social science, ranked at the top of the list, 61 in liberal arts, 46 in arts and athletics, 24 in education, 21 in engineering, 5 in medicine and 4 in science. Meanwhile, Korea’s advanced IT and outstanding cyber university system has strived to enter overseas markets. In September 2012, it established e-learning centers in Cambodia, Laos, Myanmar, and Vietnam (CLMV) and a hub center in Vietnam. The nation has test-run a credit exchange program with the CLMV through systematic interoperation between centers and a credit exchange integrating management system.

Since Hanyang Cyber University won the approval for the establishment of a special

**Table 32.** Status of Multimedia-based Lectures(as of September 2012) (unit: subjects)

Year	e-Learning Lectures		TV Lecture	Radio Lecture	Audio Lecture	Total
	Multimedia	Web				
2011	456	150	128	-	86	820
2012	528	107	121		31	787

\* As of February 2008, the audio lectures were out of service.

※ Source: Korea Open University(2012), 2012 Statistical Year Book

graduate school in October 2009 for the first time in Korea, a total of 9 cyber universities are planning to establish and operate a total 16 special graduate schools from March 2013.

## 2. Status of Korea Open University

### A. Major Status

Korea National Open University (KNOU) was the first distance university established in 1972, with an educational objective to contribute to cultivating human resources. As of 2012, the KNOU has 13 regional campuses across the country and three learning centers in Seoul and 32 learning halls in major cities and provinces. Each regional campus carries out all student affairs from entrance to graduation in the same manner. A total of 160,600 students are currently enrolled in KNOU as of April, 2012. If broken down by age, those in their 30s account for an overwhelming majority 73.2%, which well measures up to the KNOU's foundation objective.

Korea National Open University's Undergraduate Course has 22 departments and 4 colleges : the College of Liberal Arts, the College of Social Science, the College of Natural Science, and the College of Educational Science. In 2001, the KNOU established 4

graduate course departments with a total enrollment of 200 students; the Department, of Administration, the Department, of Business Management, the Department, of Information Science, and the Department, of Lifelong Education. Since then, the number has increased to 800 in 2012.

### B. Status of Lecture Contents

All courses at Korea National Open University are provided via various forms of information and communications media. Depending on the features of subjects, lectures are developed and delivered by using a form of media such as TV, audio, or e-learning (multimedia or, web). Out of a total of 787 subjects currently offered by the KNOU in 2012, or 635 subjects are delivered through e-learning formats, while 121(15.37%) are TV lectures, and 31(3.94%) use audio lectures.

In addition, the Korea National Open University started its learning-on demand service and is planning to develop and promote courses for those learners in their 40s and 50s to help adult learners design their second life.

## IV. ICT in Academic Research

01

### Status of ICT in Academic Research

#### 1. ICT in Academic Research in Universities

The quality academic information service is often said to be the prerequisite for securing the competitiveness of the universities. University libraries play the most important role in the ICT in academic research. Private universities' book collection, which is the primary function of a university library, showed a relatively lower number of books than those of national and public universities. The average book collections of national and public universities is estimated to be 1.02 million

Table 33.

Status of Collection of Books and Non-Books by Types of University Establishment (as of March 2012)

Type		Books	Non-Books
Universities	National & Public	1,025,288	38,856
	Private	573,298	27,615
Junior Colleges	National & Public	44,625	2,737
	Private	87,265	3,915
Education University		271,872	7,096
Industrial University		376,412	11,230
Others		67,845	3,359

※ Source: Ministry of Education, Science and Technology, Research Information Statistics System

books, while private universities possess an average of about 570,000 books.

Recently, all universities have established a bibliography database and the number of those universities which use KERIS' union catalog increased to about 700. This shows that the catalogs of books recently purchased by universities have been digitalized. Given that the number of rare old books registered on the academic resource statistics system run by the MEST is about 302,000, the digitalization rate still remains at a low level. Only 19.5% of the bibliography digitalization means that the ratio of the digitalized full texts may be even lower.

However, the subscription rate of overseas electronic academic research information, including academic databases and electronic journals, has been steadily growing. The average number of subscribed academic information types is also on the rise. In 2012, the expense for electronic data remained at 14.6% of the total resource acquisition budget, and increased substantially to 44.7% in 2012. KERIS has secured licenses on overseas academic research databases for universities and makes available the resources to researchers in all universities. Those universities who participated in the state's purchase of licenses on overseas academic databases can use the concerned databases at a discounted rate.



## 2. ICT Infrastructure for ICT in Academic Research in Korea

In today's highly advanced information society, the establishment of a system for collection, organization, analysis, processing and circulation, a system of domestic and overseas academic research information can boost the national competitiveness, which in turn will surely contribute to improving the development of academic research, the quality of education, and ensuring a quality of life for all people.

The roles of major institutions in charge of ICT in academic research are as follows.

### A. National Information Society Agency (NIA)

The NIA is implementing the knowledge information resources management project which digitalizes national knowledge information of high value in areas such science and technology, education and academy, culture, history, and information and communication for national circulation of ICT in academic research. The National Knowledge Portal, which started its service in November 2001, was linked to 1,389 public institutions in 2011 and, offered a total 3.11 million knowledge information resources. In December 2009, it became stabilized and has operated the knowledge information resource circulation system called 'Knowledge Market' ([www.knaru.kr](http://www.knaru.kr)), which links the state's database with private-sector portal sites to offer its service to the public.

### B. National Institute of Korean History (NIKH)

The NIKH established and has operated the Korean history database through its website since 1997. The 'Korean History Online' ([www.koreanhistory.or.kr](http://www.koreanhistory.or.kr)) offers an integrated search service for metadata of websites related to Korean history (Koreanology). There is an urgent need to digitalize the history records to prevent loss and damage of ancient texts in relation to Koreanology. Before the precious ancient records get damaged, these records need to be digitalized for permanent storage.

### C. National Library of Korea

The National Library of Korea, the nation's most representative library, is responsible for collecting and maintaining the cultural heritages of the current generation and passing them down to the future generation. It established and has operated the Internet website ([www.oasis.go.kr](http://www.oasis.go.kr)) from February 2006 to collect data, offer users' services on its preserved documents, and promote its service at home and abroad. The "Library Portal" ([www.library.net](http://www.library.net)), is an online service space of the National Digital Library of the National Library of Korea, and was opened on May 25, 2009. It has offered its service to allow anyone to use quality digital contents. Also, it established the National Information Bibliography Database, the National Information Table-of-Contents Database, the Important Information Full Text Database, and the Article Index and Abstract Database.

#### **D. Korea Institute of Science and Technology Information (KISTI)**

The Korea Institute of Science and Technology Information (NDSL) promotes ICT in science and technology by pursuing the informatization project in the National Discovery for Science Leaders and other academic associations. In particular, the NDSL is designed to promote the innovation of science and technology by offering high quality information to the nations' researchers in academic, research and industry fields, and it currently has more than 96 million theses, patents, and research papers in science and technology.

## Sharing and Circulation of Research Information

### 1. Establishment and Operation of ICT in Academic Research

#### A. Outline

The Research Information Service System (RISS) offers an integrated search service for various research resources and is based on the nationwide university academic information sharing system. It offers services to consumers such as professors, doctoral and master's degree holders, graduate students, researchers, etc. through its integrated portal site ([www.riss.kr](http://www.riss.kr), [m.riss.kr](http://m.riss.kr)).

#### B. Progress

##### 1) RISS

As of September 2012, RISS provides 2.3 million members including professors, graduate students, and undergraduate students with the academic research information service. A total of 61.28 million searches and 26.25 mil-

lion digital full text downloads are recorded per year. The RISS offers an intergrade search service on 9.5 million single-volume books possessed by major universities through the 'Union Catalog' and allows users to know what university owns the book they need with its database of 4,669 resources. For academic journal articles, it allows users to search for these linked to 38.2 million cases of metadata stored a database which was constructed in a contract with the British Library and to know which university has the academic journal magazine with the edition they need.

Meanwhile, the RISS provides a search service for digital texts of domestic doctors' and master's degree theses that have been collected through 'dCollection' from universities across the country. In terms of overseas academic journal articles, it operates 9 foreign research information centers (FRIC; [www.fric.kr](http://www.fric.kr)) together with the MEST to share academic research information and reduce budget costs.

##### 2) Union Catalog Service

The union catalog service promotes efficiency of bibliography compilation by jointly

Table 34. Status of Major Content Production by Year according to RISS (accumulated)

Classification		2009	2010	2011	2012
Thesis	Domestic (Full Text)	794,497	887,910	959,594	1,059,962
	Overseas (Full Text)	106,073	115,297	119,165	135,021
Academic Journal Article	Meta Data	34,967,383	37,391,874	39,937,613	41,014,091
	(Full Text)	2,392,849	2,737,208	2,828,727	3,112,244
Academic Journal	Domestic (types)	44,949	43,902	43,661	43,544
	Domestic (issues)	818,726	835,235	850,430	871,989
	Overseas (types)	102,265	102,597	117,492	123,442
	Overseas (issues)	4,459,544	4,613,722	4,747,935	4,887,098

writing and maintaining a catalog of books purchased by university libraries, and allows users to locate which university owns the book they need and to get the information they want from the library. As of September 2012, the union catalog service possesses 9.6 million bibliography data and 47.33 million pieces. In addition, the establishment of a bibliography of the U.S. Library of Congress contributes to facilitating a catalog compilation about foreign books and papers.

### 3) Inter Library Loan Service

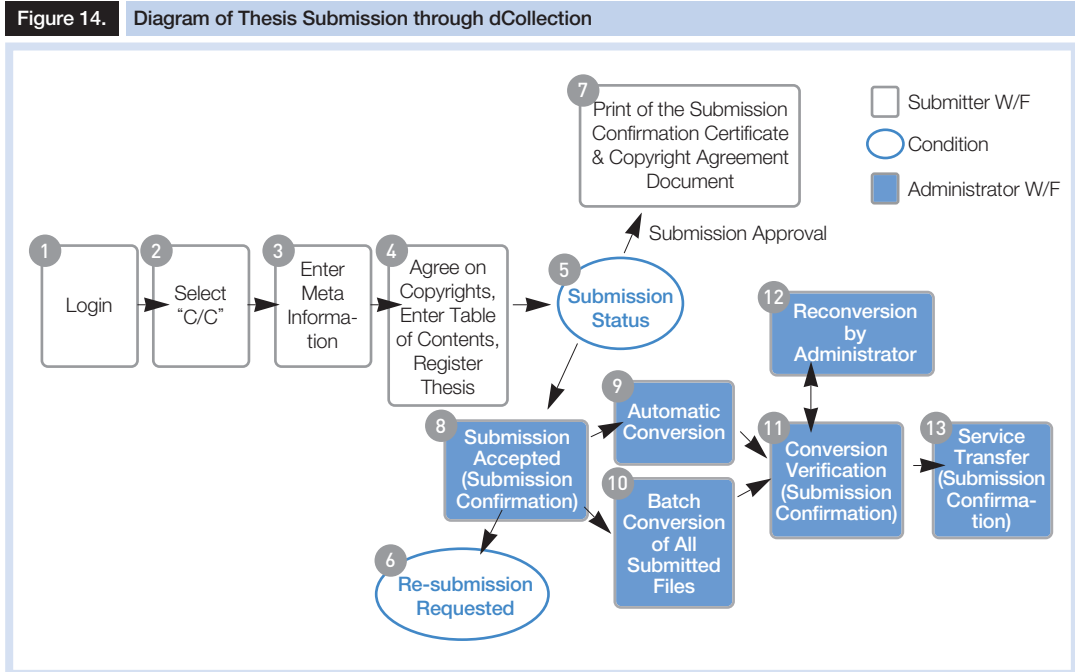
The WILL service of KERIS is affiliated with similar services such as Japan’s NII and, China’s CALIS, for an interlibrary loan service with overseas universities. WILL has expanded from 29 institutes in 1999 to 561 institutes as of September 2012. This shows that the sharing of academic research infor-

mation among universities is being actively done through the interlibrary loan service of RISS.

## 2. Establishment and Operation of Digital Academic Information Circulation System

### A. Integrated Operation of Digital Academic Information Circulation System (dCollection)

Thanks to the widespread use of computers and web services, the circulation of user created content is gathering speed. The Korea Education Research Information Service established and operates a systematic digital collection and management system called ‘dCollection.’ ‘It’ serves as a data warehouse designed for universities to collect, maintain,



manage and circulate digital information resources they possess.

### **B. Operation of full text service of theses and academic journal articles**

As of the first half of 2012, about 2.96 million academic journal articles and about 0.99 million theses have been provided, totaling about 3.95 million full texts. As it has realized an academic journal integrated service in partnership with private sector companies which offer paid academic thesis services, RISS allows users to locate and use academic research information at the same time.

## V. ICT in Lifelong Education

01

### Lifelong Education Information Network Service

#### 1. Outline

The government has steadily secured lifelong education support systems in various fields, while some metropolitan and provincial governments endeavor to establish ICT in lifelong education at a metropolitan level as part of an effort to lay the foundation of offering more learning opportunities for local residents. To utilize lifelong education information as a civil service, there is a need to come up with a guideline on the storage and distribution of information within the lifelong education information system. The classification system of lifelong education institutions and

the metadata standard on lifelong education information also need to be established to collect and link data at a metropolitan level. The project for constructing the 'Da-moa Lifelong Education Information Network' is to create a civil service system using lifelong education data including lifelong education institution and program information. Another key role is, for compatibility between systems, to create technical standards on storage and circulation of lifelong education data including lifelong education institution and program information. The project was initiated to build a relay system to build, link and release a future information system.

#### 2. Status of Operation

The construction of 'the Da-moa Lifelong Education Information Network' was one of

Table 35. Status of Metropolitan Cities and Provinces' ICT in Lifelong Education

Metropolitan City and Province	Service Name	Year of Groundbreaking
Seoul Metropolitan City	Seoul City Lifelong Education Portal ( <a href="http://sll.seoul.go.kr/">http://sll.seoul.go.kr/</a> )	2011 (self-established)
Gyeonggi Province	Gyeonggi Lifelong Education Portal ( <a href="http://gil.gg.go.kr/">http://gil.gg.go.kr/</a> )	2011 (self-established)
Busan	Busan Lifelong Education Portal ( <a href="http://www.ble.or.kr">http://www.ble.or.kr</a> )	2011 (Damao)
Chungnam Province	Chungnam Damao Lifelong Education Information Network ( <a href="http://damao.chungnam.net/">http://damao.chungnam.net/</a> )	2011 (Damao)
Daejeon Metropolitan City	Under Construction	2012
Jeju Special Self-Governing Province	Under Construction	2012
Ulsan Seoul Metropolitan City	Under Construction	2012

the new projects that started in 2011. The MEST held the public bidding competition and the National Institute for Lifelong Education organized the evaluation procedure to select two metropolitan city and province: Busan Metropolitan City and Chuncheong nam-do Province. The selected city and province established a network of basic local governments and lifelong education institutions under their jurisdiction, constructed the 'Da-moa Lifelong Education System' by establishing an integrated system to collect related data and build a DB, and started its service in early 2012. This service informs users on the updated information about 1,100 programs run by the concerned institution, and also offers information about the status of program completers, region-specific status of institutions, educators' information, group club activities, etc.

## Lifelong Education System Support Service

### 1. Outline

The project for ICT in Lifelong Education was initiated to facilitate the lifelong education system and build a required infrastructure. As representative lifelong education programs, the Lifelong Learning Account System helps people manage the learning experiences both comprehensively and intensively, whereas both the Academic Credit Bank System (ACBS) and the Bachelor's Degree Examination for Self-Education offer an opportunity to achieve a bachelor's degree in recognition of their lifelong education achievements.

### 2. Status of Major Projects for ICT in Lifelong Education

The Lifelong Learning Account System ([www.all.go.kr](http://www.all.go.kr)) is an information system which accumulates and maintains the learning results and history of the programs that users

have completed in their whole lifetime, and helps users manage their records of learning experiences for a practical purpose or as a formality. As of June 2012, about 4,000 people have opened lifelong learning accounts.

The Academic Credit Bank System (ACBS) is an educational system which recognizes diverse types of learning experiences acquired not only in school but also outside of schools to allow people to accomplish a bachelor's degree. The ACBS has 6 sources of credits: 'Completion of Accredited Courses through ACBS,' 'Certificate Acquirements,' 'Passing Bachelor's Degree Exam for Self-Education or Courses for Exemption,' 'Possession or inheritance of important intangible cultural Properties,' 'Completion of College Part-time Courses' and 'Acquirements of College Credits.' As of February 2012, 290,346 persons received bachelor's degrees through the Academic Credit Bank System. Some of them took it as an opportunity to get a decent job, and others moved onto the next stage of education and transferred to other universities. As of now, the Bachelor's Degree Examination for Self-Education offers 9 degree courses: Korean Language & Literature, English Language & Literature, Business Administration, Law, Public Administration, Early Childhood

Table 36. Status of Degree Holders through Academic Credit Ban (as of February 2012)

	1999-2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Junior Bachelor's Degree	5,694	5,245	4,666	3,549	4,657	5,493	7,957	13,633	21,912	29,126	23,216
Bachelor's Degree	2,269	2,555	4,091	9,193	12,883	20,708	24,748	31,442	26,051	19,478	11,780



Education, Home Economics, Computer Science and Nursing. As of April 2012, 94,051 persons had school registers and 13,434 people received degrees since the inception of the program.

## VI. ICT in Career and Vocational Education

01

### ICT in Career and Vocational Education

#### 1. Outline

Korea has constructed and operated the information network of career paths and vocations for human resources development, which enables education and training for life-long development of vocational capability and creation of manpower demand and employment in the labor market. When it comes to ICT in career and vocation, Korea operates services such as ‘Careernet,’ a career and vocation information network, ‘NHRD-Net,’ a comprehensive information network for the national human resource development designed especially for HR policy coordinators and researchers, and

‘PQINet’ an information network to support the ‘Meister system’ and foster technicians that industrial worksites require, and also offer information on qualifications and licenses they need to carry out jobs. ‘Careernet’ offers users from elementary school students to college students and the general public a wide range of services such as career paths including information on vocation, schools and academic departments, psychological tests such as vocational aptitude and interest tests, self-directed career exploration programs, career counseling, etc. In addition, as the boundary of information search is not limited only to PCs or laptops thanks to the ubiquity of smartphones, career apps for smart devices have been developed and distributed to help users search for information about their future career paths. In particular, the government has developed and distributed a smartphone app called ‘Green Jobs’ in consideration of today’s paradigm shift to ward green growth to give information about the

Table 37. Accumulated Number of Career Net Members (unit: persons)

Year	New Members	Average Daily Subscriptions	Accumulated
2005	367,863	1,008	998,899
2006	504,876	1,383	1,498,117
2007	606,981	1,663	2,088,748
2008	784,582	2,149	2,859,662
2009	861,141	2,359	3,710,871
2010	990,847	2,706	4,696,069
2011	967,040	2,641	5,663,109
2012(6.30)	598,010	3,268	6,261,119

meaning of green jobs, features of various vocations, and the influence of green jobs on the world of vocation.

## 2. Progress

Since its inception in 2002, 'Careernet' has witnessed its accumulated number of subscribers steadily rise, and as of June 2012, the membership was estimated at 6.26 million persons. The number of those who used psychological tests offered by 'Careernet' dramatically increased in 2010 and 2011 compared to 2009.

## Human Resource Information Service

### 1. Outline

At a critical juncture of shifting to the 21st century knowledge-based society, the development of human resources plays a pivotal role in strengthening the national competitiveness and enhancing quality of life. To foster human talents at a national front, an information infrastructure has to be established in advance to lay the foundation for ICT policy-making. To this end, the Korea Research Institute for Vocational Education & Training has established and operated the national human resource development network NHRD.net since 2001.

### 2. Progress

#### A. Major Details

NHRD.net is the national human resource development network that offers comprehensive information such as HR related research trends, statistics and policy information, and integrates information services about education & training, job employment and industry, all of which used to be scattered around different ministries. Except for major services, supplementary information is provided as links in order to improve the operation efficiency of the website and prevent overlapping problems.

NHRD.net not only provides information services about the latest trends in HRD policy trends, research trends, overseas trends, and trends by indicators, etc. but also produces and offers analytical issue papers.

Table 38. Major Contents of NHRD.net

Content Menu		Details	Frequency
Human Resources Development Trend	HRD Issue	Provided in Affiliation with HRD Trend Analysis Project	Every two weeks
	Statistics Brief	Provision of Statistical Information of Panel Data and HR related Statistics	Every two days
	Policy Trend	Quantitative Reinforcement in affiliation with HRD Daily ※ Integration of Regional and Policy Trends	Frequently Updated
	Research Trend	Provision of Information on Research Trends of Domestic R&D Institutions	Frequently Updated
	Overseas Trend	Provision of Information on Overseas R&D Institutions' HRD Research Data and Statistics as well as Foreign Governments' Publications	Frequently Updated
	Trend by Indicators	Provision of Major Statistical Trends produced by Major Statistics Institutions about Education, Society, Labor, etc.	Frequently Updated
	HRD Daily	Collected in Affiliation with Policy Trends	Everyday
Data Center	Teaching-Learning Resources	Possession and Provision of High Quality Contents by Transferring Cylearn's Major Content 'Teaching-Learning Resources'	-
HR Policy Project	Best HRD	Provision of Information related to Public Sector HRD Certification System (Best HRD)	Frequently Updated
	Future HR Forum	Provision of Information related to Future HR Forum	

Figure 15. Diagram of Contents of NHRD.net

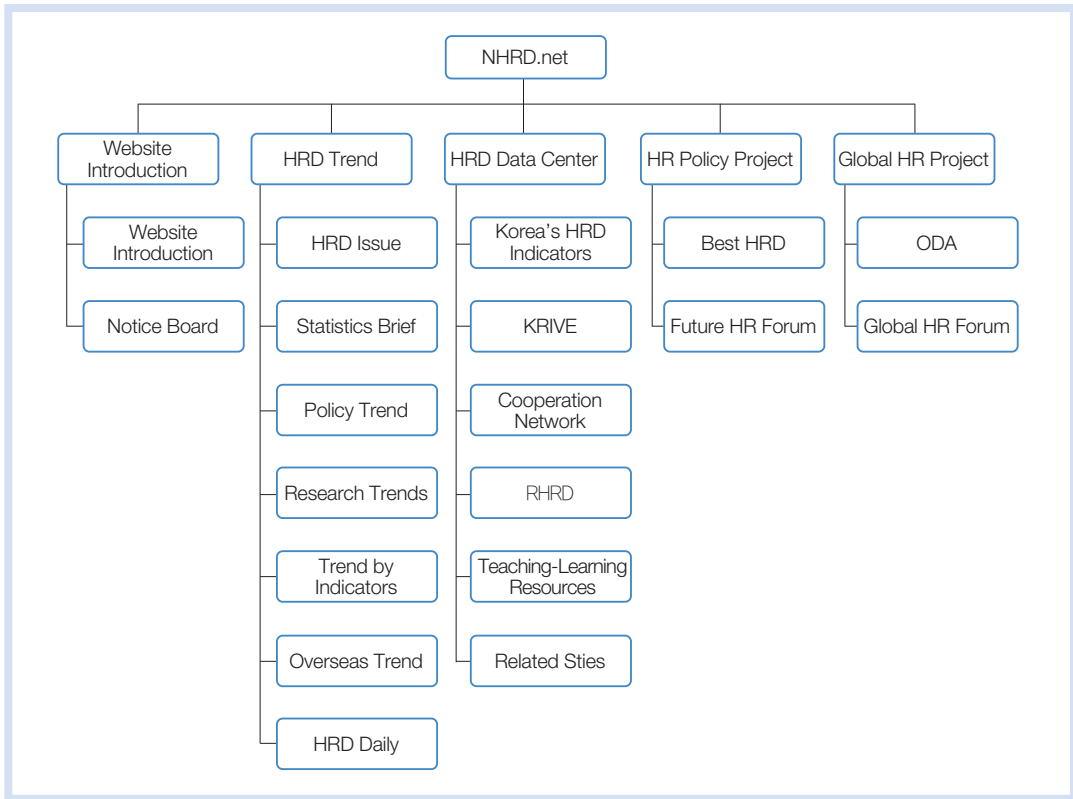


Table 39. Status of Mailing Service Recipients(as of June 2012) (unit: persons)

Members	Policy Coordinator	Researchers	Consultants	Korean Expatriates	others	Total
3,873	131	233	81	84	8	4,410

## B. Mailing Service and Production & Offering of Trend Information

NHRD.net collects issue analysis papers and offers them in mail services. It produces a human resource trend journal called HRD Review that addresses topics related 'Issue Analysis,' 'Policy Trends,' 'Global Report,' 'Panel Brief,' etc. and the KRIVET Issue Brief to offer them in mail services.

In addition, NHRD.net provides an analysis on the latest trends and statistics about nation-

al human resource development. It also shares and promotes information on HR policy businesses such as 'Best HRD' and 'Future HR Forum'. As of June 30, 2012, the membership of NHRD.net is estimated at 5,737 persons.

## Private Qualifications Information Service

### 1. Outline

Korea introduced the private qualifications registration system in earnest in 2008 in order to assess the status of private qualifications that had been autonomously managed and operated by private institutions. Private Qualifications Information ([www.pqi.or.kr](http://www.pqi.or.kr)) was established in 2009 to provide information on registered private qualifications and manage the registration system.

### 2. Progress and Achievements

#### A. Contents of Information and Status on Qualifications Registration & Certification

The Private Qualifications Information Service consists of two major sections: an information service section where ordinary users can find information about the currently operated private qualifications, and a registration section where private qualification supervisors can register their licenses. As of August 2012, the total number of registered

private qualifications was at 3,131, consisting of 87 private qualifications approved by the nation and 3,044 genuine private qualifications.

#### B. Progress

As of now, the total number of members is estimated to be 3,914. Out of them, 1,932 are institutional members and 1,982 are ordinary users.

Further information is provided through the private qualifications information service including 3,132 private qualifications information, 47 announcements, 33 news articles related to qualifications, six related laws, 11 forms, and 71 qualifications research publications, all of which can be downloaded as attached files.

As of August 2012, if one looks at the status of online civil service, and questions and answer, the registration procedure is ranked at the top with 52 cases out of a total of 70 cases of civil services that have been offered. A total of 142 comments were posted at the question and answer section about the registered private qualifications.

Table 41. Status of Private License Information Service Subscription (unit: persons)

Institutional Members	Individual Users	Total Number of Members
1,932	1,982	3,914

Table 40. Status of Registration and Certification of Private Qualifications (unit: pcs)

Classification	Dec. 2009	Oct. 2010	Oct. 2011	Aug. 2012
State Certified Private Qualifications	87	87	84	87
Genuine Private Qualifications	1,035	1,268	2,173	3,044
Total	1,122	1,355	2,257	3,131



## VII. Reducing the Educational Gap

01

### Addressing the Education Gap for Low Income Families

#### 1. Outline and Status

With the advent of e-learning driven by the remarkable development of information and communication technology, the teaching and learning process is no longer subject to time and space limits and has laid the foundation to input various information into teaching and learning resources. The Ministry of Education, Science and Technology is trying to ensure that students from low income families equally benefit from ICT in education. MEST has provided about 15,000 students with PCs and Internet fees.

It is estimated that a total of 211 billion won has been spent from 2000 to 2012 to donate PCs. To ensure that students from low income families enjoy more informatization benefits, MEST concluded MOUs with KT, SK Broadband and LG U+ to allow the metropolitan and provincial offices of education or low income families to use a harmful site blocking

service at 50 percent discounted rates if they want the additional service.

#### 2. Progress

In 2012, MEST supported low income families through agreements with Internet service providers. It renewed agreements on Internet access fees with ISPs every three years and provided Internet fee discounts and education services in accordance with the price agreements. Moreover, the Ministry is seeking to development measures through information sharing to make sure that children from low income families do not feel marginalized in an era of informatization and overcome their challenging environments, and to reduce financial burdens on households.

#### 3. Future Tasks

In 2012, an annual budget of 70.7 billion won was allocated for the PC and Internet fee subsidies and about 68.8 billion won is expected to be assigned for the budget in 2013 in accordance with the Enforcement Regulation of the Local Education Subsidy Act.

Table 42.

Achievement of ICT in Education Support Project for Children from Low Income Families  
(unit: thousand persons, KRW million)

Classification	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	Total	
Recipients (thousand persons)	PC	50	0	0	0	20	26	27	16	11	13	12	21	19	215
	Internet Fees	50	47	46	49	69	87	123	145	148	152	168	204	230	1,518
	Total	100	47	46	49	89	113	150	161	159	165	180	225	249	1,733



## ICT in Education for the Handicapped

### 1. ICT in Education for the Handicapped

The Korea National Institute for Special Education under MEST is carrying out a project titled the 'Establishment of Infrastructure for 'Education Welfare for the Handicapped' to support ICT in education for the handicapped. The key objective of ICT in education for people with disabilities is to reduce the educational divide and guarantee handicapped students' right for learning with teaching and learning support.

### 2. Project Promotion

#### A. Operation of Portal Site for Special Education Information

Eduable.net is Korea's biggest portal site for special education information which supports the teaching and learning activities of the handicapped and possesses contents for the handicapped to use depending on the type and severity of their handicap and customized services for their students' school or grade curriculums. Starting from 2012, the support for ICT for special education, which was provided only through the Internet, has now shifted to smart technology and started a social network service (SNS) which enables close interaction between informa-

tion users and producers.

#### B. National Contest for ICT in Special Education

The 10th National Contest for ICT in Special Education was held in 2012 to bridge the education gap by enhancing the IT capacity of handicapped students, to raise the awareness of special education teachers about ICT in special education, and to improve the quality of special education by identifying and distributing outstanding examples. About 2,000 persons participated in the contest.



#### C. Establishment and Operation of SNS for Special Education

There was a need to diversity the distribution method of special education information by utilizing mobile applications. As a result, a mobile-based SNS was established. An app to locate special education institutions based on GPS technology was developed to help users find where special schools (grades) or special education support centers are located in their neighborhood.

#### **D. Case Study of Classes utilizing Smart-Learning**

A case study was conducted to explore the possibility of utilizing smart devices in schools for educational purposes and to develop smart learning models which promote interaction between handicapped learners and educators by introducing a smartphone-based teaching design strategy to special education students. Moreover, a language training game for handicapped students has been developed and distributed in order to help handicapped students improve their language skills and give them an opportunity for socialization in the virtual space to help them develop social skills.

## ICT in Hospital School

### 1. Outline

Hospital schools are run for those special education students with health impediments (herein after referred to as ‘students with health impediments’) who have to be hospitalized for more than three months and are designed to help them avoid flunking out of school and maintain psychological stability. Since the original hospital school launch in Seoul National University Hospital in 1999, 5 more hospital schools were set up in 2005 and another 15 were added to the list for 3 years from 2006 to 2008. As of June 2012, there are 31 hospital schools across the nation that provide educational support to students with health impediments. To register at a hospital school, a candidate has to submit an application form with a proof of health impediment, and the hospital school is responsible for offering a curriculum and managing the students’ attendance and absence.

### 2. Progress

As students with health impediments have difficulty attending classes like regular healthy students, primary students have to attend more than one hour of class while their middle and high school counterparts have to participate in more than two hours of classes. Meanwhile, the nationwide hospital website (<http://hoschool.ice.go.kr>) was launched and operated in 2007. The main contents of the website include the nation’s hospital school’ contact statuses, education programs, entrance procedures, and learning references. The website also has opened a corner where teachers, students and parents can exchange their opinions.

Moreover, the Ministry of Education, Science and Technology has held an annual workshop for students with health impediments, parents, special education teachers, general teachers, hospital officials and volunteer workers since 2006, to offer a place to enhance hospital personnel’s professionalism and to establish a network for close cooperation.

Table 43. Table 43. Progress of Number of Newly Opened Hospital Schools (unit: schools)

Year	2008	2009	2010	2011	2012
No. of New Hospital Schools	29	30	31	32	31

※ Source: Annual Special Education Report (Ministry of Education, Science and Technology, 2008, 2009, 2010, 2011, 2012)

Table 44. Progress of Number of Hospital School Applicants (unit: persons)

Year	2008	2009	2010	2011	2012	the whole
No. of Applicants	1,317	699	1,005	1,190	1,058	5,269

※ Source: Ministry of Education, Science and Technology (2008, 2009, 2010, 2011, 2012), Annual Special Education Report

## VIII. Creation of Healthy Cyber Culture and Privacy Protection

01

### Creation of Healthy Cyber Culture

#### 1. Campaign for Healthy Cyber Culture

##### A. Project Outline

Devices and services operating on the Internet require smooth connection of services at anytime and anywhere. However, another new challenge to overcome is preventing ICT-related side effects. The government, private enterprises and private sector organizations have so far carried out a variety of activities to reduce adverse functions and create a healthy cyber culture through sound information activities.

##### B. Status

###### 1) Revision of Law

The Ministry of Gender Equality and

Family introduced the nighttime “shutdown” policy to protect young adolescents from Internet addiction and guarantee them a right to sleep and study in accordance with the amendment to the Juvenile Protection Act. The nighttime shutdown policy blocks young gamers under the age of 16 from playing games between midnight and six a.m. of the following morning, effective on May 19, 2011. After the education period starting from November 20, 2011, the enforcement came into force in 2012. The selective shutdown, which can choose certain hours, is also available for those under 18, if their parent or legal guardian wants the shutdown.

###### 2) Month of Information Culture

The 25th Month of Information Culture was held in 2012 under the theme of a ‘Safe and Warm Smart World.’ A variety of exhibitions, performances and contests took place across the country, and the ‘IT Hope Sharing Volunteer Corps’ was established to donate their time for ICT ethics education, music and

Table 45. Chart for Comparison of Game Use Regulations

Classification	Forced Shutdown	Selective Shutdown
Concerned Ministry	Ministry of Gender Equality and Family	Ministry of Culture, Sports and Tourism
Target	Juveniles aged under 16	Juveniles aged under 18
Applicant	None (Forced),	Applicants or their parent or legal representative
Regulated Hours	Shutdown from 00 A.M. to 06 A.M.	Applicants cannot play a game during the regulated hours they selected.
others		Provision of Monthly Game Use History List

※ Source: Juvenile Protection Act & the Promotion Act on Game Industry

**Table 46. Types of Cyber Crime by Year (as of August 2012) (unit: cases)**

Classification	Total	Hacking Virus	Online Fraud	Cyber Bullying	Operation of Illegal Website	Sale of Illegal Replica	others
2004	63,384	10,993	30,288	5,816	2,410	1,244	12,633
2005	72,421	15,874	33,112	9,227	1,850	1,233	11,125
2006	70,545	15,979	26,711	9,436	7,322	2,284	8,813
2007	78,890	14,037	28,081	12,905	5,505	8,167	10,195
2008	122,227	16,953	29,290	13,819	8,056	32,084	22,025
2009	147,069	13,152	31,814	10,936	31,101	34,575	25,491
2010	103,809	14,874	35,104	8,638	8,611	17,885	18,697
2011	91,496	10,299	32,803	10,354	6,678	15,087	16,275

※ Source: Cyber Police ([http://www.police.go.kr/infodata/pds\\_07\\_totalpds\\_03\\_01.jsp#none](http://www.police.go.kr/infodata/pds_07_totalpds_03_01.jsp#none))

arts, and sports activities with marginalized children at regional children’s centers.

### 3) Cyber Crime

When information producers do not have a proper sense of ethics, it is likely that they can do harm on others with illegal and indecent content or that the Internet can be flooded with defaming comments. According to cyber police, the types of cyber crimes include hacking, viruses, Internet fraud, cyber bully-

ing, operation of illegal websites, and sale of illegal reproductions.

### 4) Internet Addiction

The number of Internet addicts, who build tolerance after excessive Internet use and, lose control due to withdrawal symptoms, and cannot cope in their daily lives, is constantly on the rise. According to the 2011 survey on internet addicts announced by the Ministry of Security and Public Administration and the

**Table 47. Projects for 2011 Warm Digital World Campaign Network**

Classification	Issue	Organization
Cyber Security	Safe Internet Culture Education for Children from Low Income Families	Korean National Mothers’ Association National Solidarity for Children’s Health
	Positive Comment Campaign for Establishment of Healthy Information Culture	‘Sunfull’ National Movement Headquarter
Sharing Donation	Production and Distribution of Documentary titled ‘Support for Hope of Handicapped Persons’	Korean Society of Rehabilitation of Persons with Disabilities
	Digital Knowledge Sharing Festival	Creative Commons Korea
	Multicultural Families; ‘Send Daughter of Korea to Mother Country’ Contest	KT Culture Foundation, etc.
Information Culture Propagation	Publication of Internet News ‘New Shoots of e-World’	The Ethics Council on Internet
	Newly Coined Witty Word Contest	Hangul Culture Solidarity
	Production and Propagation of Warm Clean Content through SNS	Clean Contents Movement

※ Source: National Information Society Agency (2012), 2011 Fact-finding Research Report on Internet Addiction

National Informatization Society Agency on March 2012, the Internet addition rate accounted for 7.7%, or 2.34 million people, which is slightly down 0.3% from the previous year. However, those in the high risk group have increased to by 0.3% to 1.7%.

### 5) Reinforcement of ICT Ethics Education

To promote healthy Internet ethics, it is very important to develop a sense of discriminative ethics as a responsible member of ICT society. The ICT ethics education for adolescents is carried out in three stages-knowledge, attitude and practice.

### 6) Expansion of Private Sector's Healthy Information Culture Movement

In 2010, the government launched the "Warm Digital World Action Network" consisting of 24 ICT related civil organizations to carry out a campaign to promote cyber security, sharing and donation and ICT culture. In 2011, 'a campaign jointly hosted by the Korea Communications Commission and Korrea Internet and Security Agency called, Ainsel' - Creating a Beautiful Internet World in English- a nationwide campaign of promoting a sound and safe Internet environment both online and offline in order to spread the 2011 cyberspace security and sharing and donation ICT culture.

## 2. Status of ICT Ethics Education in Elementary and Secondary Education

### A. Background

According to the 2012 second school violence status survey by the Ministry of Education, Science and Technology, 7.3% of those respondents who had experienced school violence said that they had been bullied in cyber space. To actively respond to cyber crimes, a cyber violence counseling center will be set up through consultation with the Korea Communications Commission, Prosecutor's Office, Ministry of Education, Science and Technology, Ministry of Gender Equality and Family, and other related government departments. Teaching plans for hands-on experience activities for adolescents and teacher training programs to prevent cyber crimes will be developed and implemented in earnest from 2013.

### B. ICT Ethics Education through Regular Curriculum

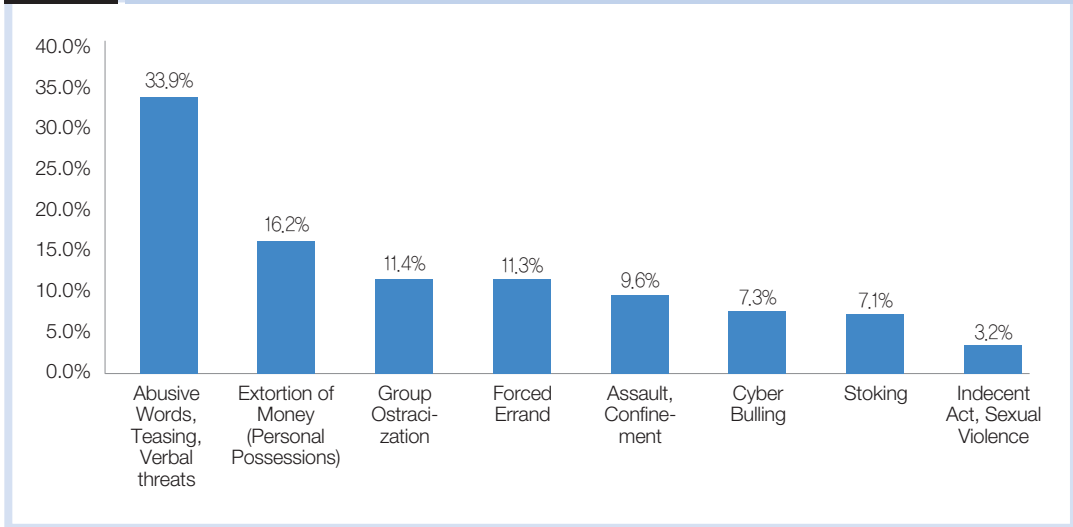
#### 1) Reinforcement of ICT Ethics Education in the Curriculum

The content of the ICT ethics education unit that had been reflected in the 15 subjects of the 7th revised curriculum was expanded to 24 subjects in the 2007 revised curriculum, which was to be gradually adopted from 2009. The curriculum was revised with the aim to ensure that students are exposed to various ICT ethics lessons of multiple subjects during regular classes and that they are able learn them naturally.

#### 2) Development and Distribution of ICT ethics learning contents

As part of an effort to develop and distribute learning contents which can be utilized in

**Figure 16.** Types of Victims according to the Results of the 2012 Second School Violence Survey



※ Source: EduData Service's Statistics on Elementary and Secondary Education

1) 5.14 million Korean students from the fourth grade of primary schools to the third grade of high schools participated in the survey, which was run by the Korean Educational Development Institute (from August 27 to October 12, 2012; about 210,000 students in Jeonbuk were excluded).

teaching subjects or creative hands-on experiences based on the lessons of ICT ethics education lessons, 65 teaching subjects and 20 creative hands-on experiences were developed in 2011 and 2012.

### **C. Government Ministries' ICT Ethics Education for Students**

The Ministry of Security and Public Administration, which is responsible for national ICT, is helping students benefit from various ethics projects through close partnership or cooperation with 7 other government departments. The projects include prevention and reduction of Internet addiction, harmful website blocking, content distribution, program operation, contests and campaigns.

## Prevention of ICT-related Side Effects

### 1. Educational Institutions' Private Information Protection Policy

#### A. Outline

The Private Information Protection Law was enacted in 2011, and after a 6month education period, came into force on March 30, 2012. The importance of personal information protection is more important than ever. The Ministry of Education, Science and Technology has focused not only on education and promotion of personal information protection but also establishment of security servers and an I-PIN (Internet Personal Identification Number) system. The MEST

also carried out a fact-finding survey on private information protection, offered consulting, and conducted monitoring to prevent exposure or theft of private information.

#### B. Progress and Major Achievements

##### 1) Personal Information Protection Education

The Ministry of Education, Science and Technology and its affiliate institutions held cyber trainings 10 times from February to November 2011 for 7,901 persons through the National Training Institute of Education, Science and Technology website to raise public awareness about the importance of precious personal data, principles on personal information protection and how to apply them to their work.

Table 48.

Details of Amendments to Laws on Private Information Protection by Ministry of Education, Science and Technology

legislation	Details of Personal Information Concerned
Enforcement Decree of the Act on the Higher Education	Academic Affairs Management System Including Compilation and Management of School Register, Entrance Exam, Execution of Residents' Registration Number Processing
Act on the Establishment of the Korea Scholarship Foundation	Residents' Registration Number, Family Relations, etc.
Enforcement Decree of the Act on the Establishment of the Korea Scholarship Foundation and Others	Student Loan related Business Support including checking the Earned and Financial Residents' Registration Number, Family Relations, etc.
Enforcement Decree of the Act on Repayment of Student Loan after Employment	Management of Loan Repayment after Employment
Enforcement Decree of the Act on Early Childhood Education	Operation of Information System in relation to Background Checkup & Preschoolers' School Expense Support Application
Enforcement Decree of the Act on Professional Engineers	Identity Checkup against False Report, Registration Prevention, Imposed Penalty Fees
Enforcement Decree of the Act on Lifelong Education	Identity Checkup for Social Acceptance of Learning Account Certificate
Enforcement Decree of the Act on Credit Recognition	Checkup of the Academic Achievement Approval for Diploma through Unique identification Number



## 2) Private Information Protection Diagnosis and On-site Inspection

The personal information protection assessment of education and research institutions was held from August to September 2011 by conducting an objective security level test on compliances specified in the personal information protection law and guidelines to find security breaches and improve the security level by remedying shortcomings. The security level test is conducted in a form of self-diagnosis and on-site inspection. The on-site inspection was carried out on 4 metropolitan and provincial offices of education, 11 universities, 3 affiliated institutions, and 2 research groups. A total of 10,182 institutions participated in the self-diagnosis, and the average test score was 96.8.

## 2. Establishment and Operation of Cyber Safety Center

### A. General Status

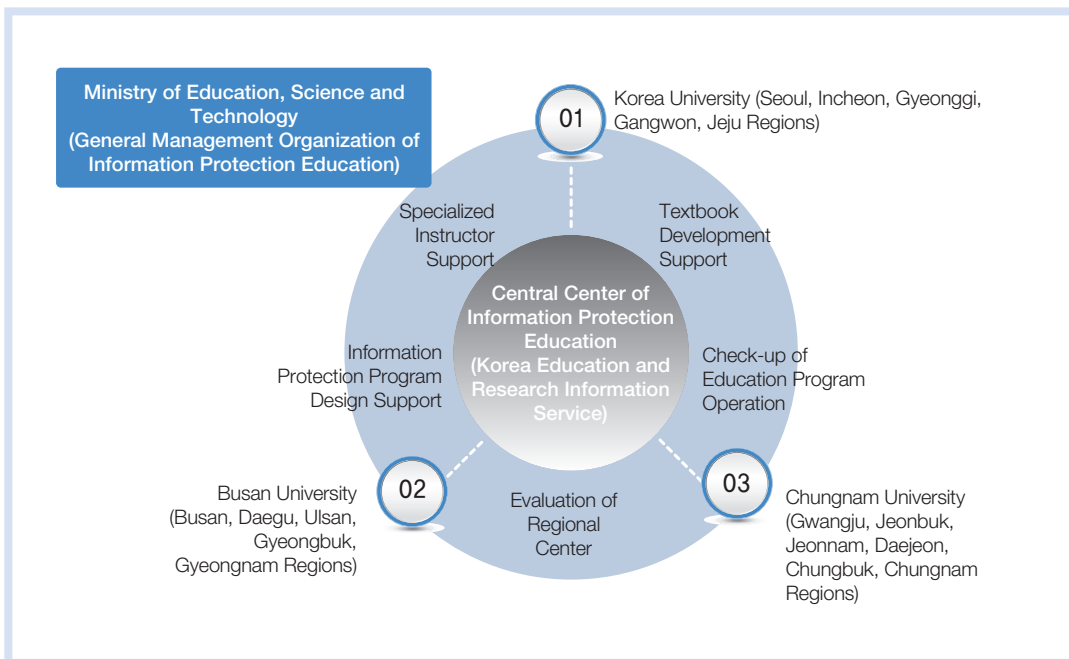
MEST established the Education Cyber Security Center (ECSC) in February 2008 and has been operating the center to protect important educational information resources and to minimize damage from cyber attacks which have become more elusive and sophisticated (phishing, worms, viruses, etc).

### B. Major Roles

#### 1) 24-hour Security Control against Cyber Attacks

The Cyber Security Center focuses on cyber security activities and collects and analyses cyber threats against educational institutions by operating its intrusion response system to

Figure 17. Central and Regional Centers of Information Protection Education



monitor cyber attacks on educational institutions' information resources for 24 hours and 365 days a year. It minimizes the proliferation of damage with quick responses upon detecting any intrusion.

### 2) Preventive Activities for Cyber Security

The Cyber Security Center conducts an intensive inspection on educational institutions such as universities and education offices to check their information security, check and analyze vulnerability to cyber attacks, and improve the information security upon detecting any security breach.

### 3) Quick Response and Restoration in case of Cyber Attacks

The Cyber Security Center is dedicated to analyzing the cause of accidents in case of cyber attacks on educational institutions, restoring damages and minimizing their proliferation

### c. 2012 Major Activities

The 2012 cyber crisis response trainings were carried out on institutions including metropolitan and city offices of education, affiliated institutions, and public institutions. The table top exercises were conducted on a total of 60 educational institutions, while the mock-intrusion training and DDoS mock training were carried out on 12 and 6 institutions.

## 3. Construction and Operation of Digital Certification Center

### A. Outline

MEST materializes a safe cyber space for educational administration by integrating all certification systems with the National Public Key Infrastructure (NPKI) and revitalizing the electronic signature certification system. About 830,000 old certificates were replaced with new ones from February to November 2012.

### B. Projects by Stage

The construction of the certifying system was done in three stages: introduction, expansion, and advancement. The first stage (Construction of the Digital Certification Center under MEST; January 2007-December 2008) finalized the certification practice statement and established the certification and certificate issuance systems. The second stage (Expansion of the MEST Education Certification System ; January - December, 2009) introduced and established the Online Certificates Status Protocol (OCSP) and reinforced the safety and security of the service by dualizing the network and security equipment of the certification center. Finally, the third stage (Securing Stability of the MEST Electronic Signature Certification System : January 2010 - December 2012) established the integrated certification gateway and backup center for the education certification system.

### C. Detailed Tasks

The detailed tasks include the construction of registration authority (RA/LRA) of metropolitan and provincial offices of education, universities and research institutions. As the electronic signature certification center was

**Table 49.** Status of Certification Issuance of GPKT by Ministry of Education, Science and Technology(as of June 2012)

Classification	Individual	Institution	Business	Server	SSL	Total
Ministry of Education, Science and Technology (Affiliated Institutions)	3,433	24	106	37	39	3,639
Metropolitan and Provincial Office of Education	762,433	29,944	15,541	1,890	6,808	816,616
Universities	32,888	160	1,235	725	1,927	36,935
Research funded Institutions	1,963	19	481	123	238	2,824
Total	800,717	30,147	17,363	2,775	9,012	860,014

established, efforts have to be made to maintain stable operation, set up an organization, pool human resources, secure a budget allocation, and revise laws and systems.

In the third advancement (construction of the integrated certification gateway and back-up center), the establishment of an RA/LRA was completed to secure the education certification management system and continuous investments were made to enhance the certification system's stability, survivability and utility. Metropolitan and city offices of education serve as registration authorities (RA), and education support offices play the role of local registration authorities (LRA), both of which support the GPKI certification system. Universities and state-funded institutions are also designated and run as local registration authorities.

# IX. International Cooperation in ICT in Education

01

## International Cooperation in ICT in Education

### 1. Background of International Cooperation

Thanks to the country's rapid e-learning development and outstanding outcomes, many countries from Asia, Africa and Latin

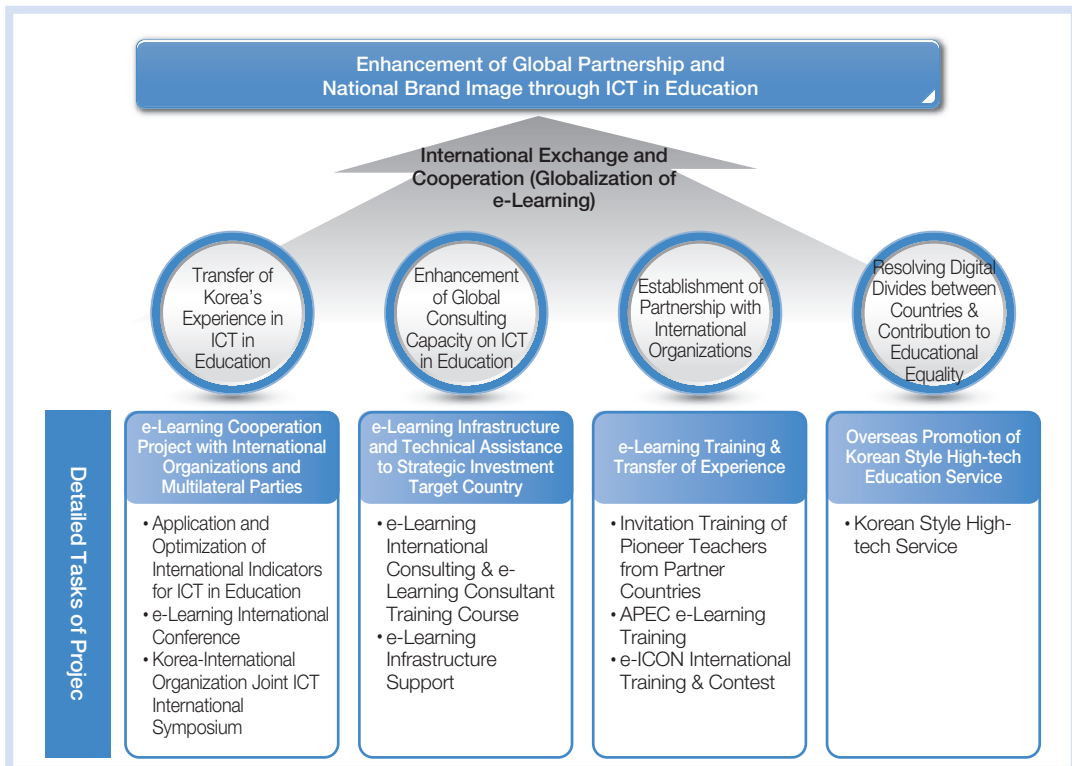
America have been asking for global partnership with Korea. To this end, efforts need to be at a national level for the globalization of Korean e-learning.

### 2. Project Details

#### A. Development of International Indicators for ICT in Education and Preparation Analysis Project

As part of the globalization project of e-

Figure 18. Diagram of Mid-term Vision of e-Learning Globalization Project



Learning, the MEST and KERIS have been developing international standard indicators for ICT in education since 2006 to measure the level of ICT in education by nation and analyze the preparation level of ICT4ED (ICT for Education Development) and to reflect the results in the concerned country's policy for ICT in education.

### **B. E-Learning Korea**

Korea's e-learning endeavors to establish an international HR network required to formulate e-learning policies and promote the global status of Korea's academic capacity of e-learning capacity in cooperation with related government departments and experts at home and abroad. Korea has held e-learning international conferences and international exhibitions seven times from 2006 and 2012.

### **C. Joint ICT Global Symposium with the World Bank**

KERIS was commissioned by MEST to jointly hold the 2012 Korea-International Organization Joint ICT Global Symposium at the Seoul Shilla Hotel from December 11 to 14, 2012. The event was coorganized with the World Bank, UNESCO's Bangkok headquarter office, and Intel, under the theme of 'Quality Content for 'Quality Education in the Digital Age.'

### **D. E-Learning International Consultant Training Program**

The e-learning International Consultant Training Program operates to foster international consultants who can identify business opportunities to strategic investment support

countries (21,466 PCs from 2005 to 2012) in relation to the overseas expansion of Korea's successful models of ICT in education, execute and manage a project, carry out the overall evaluation, and support ICT infrastructure like PCs.

## **3. E-Learning Training and Transfer of Experience**

### **A. Invitation Training of Pioneer Teachers from Partner Countries**

The Invitation Training of Pioneer Teachers from Partner Countries, which is organized by the 16 metropolitan and provincial offices of education, is conducted for education administration officials, policy makers, and pioneer teachers recommended by the ministries of education or offices of education of partner countries. In 2012, the program invited 348 teachers from 16 countries from Southeast Asia, Central Asia, Africa, and Latin America to enhance their capacity for ICT in education and offer them a chance for to experience Korean culture.

### **B. APEC E-Learning Training**

APEC E-Learning Training is carried out to share Korea's e-learning experiences and best practice cases with educational members and pioneer teachers of 12 APEC member countries and bridge the educational gap with the APEC region. 589 trainees have so far completed the course from 2005 to 2012.

**Table 50. Status of Infrastructure Support by Metropolitan and Provincial Office of Education**

Metropolitan and Provincial Office of Education	Target Country	'05	'06	'07	'08	'09	'10	'11	'12	Total
Busan	Cambodia	140	150	150	150	150	210	15 (Laptop)	18 (Laptop)	983
Chungbuk	Indonesia	100	300	-	-	-	-	18	-	418
	Philippines	-	-	-	150	150	-	50	-	350
	Paraguay	-	-	-	-	-	-	-	18 (Laptop)	18
Chungnam	Laos	125	220	420	170	15 (Laptop)	15 (Laptop)	15 (Laptop)	18 (Laptop)	998
Jeonbuk	Philippines	100	150	170	150	150	300	134	158 (Construction Materials for IT Center)	1,312
Jeonnam	Malaysia	100	157	150	150	150	150	15 (Laptop)	100	972
Gyeonam	Vietnam	100	150	-	-	-	31 (Construction Materials for IT Center)	33 (Construction Materials for IT Center)	111 (Construction Materials for IT Center)	425
Daegu	Bangladesh	100	-	-	-	15 (Laptop)	15 (Laptop)	25 (Laptop)	20 (Laptop)	175
Incheon	Pakistan	100	150	150	-	-	-	-	-	400
	Colombia	-	-	-	-	-	14 (Laptop)	15 (Laptop)	18 (Laptop)	47
Gwangju	Sri Lanka	100	150	150	150	-	50 (New PC)	161	70	831
	Kyrgyzstan	-	-	-	-	150	-	-	-	150
	China	-	-	-	-	-	-	25	-	25
Ulsan	Yemen	-	150	150	150	165	165	129	18	927
	East Timor	-	-	-	-	-	165	-	-	165
Seoul	Uzbekistan	100	300	300	300	300	250	250	250	2,050
	Mongolia	-	-	-	-	-	-	250	250	500
Gyeonggi	Kazakhstan	100	170	340	500	340	122 (New PC)	83 (New PC)	300 (New PC)	1,955
Daejeon	Mongolia	2,200	1,000	500	-	18 (Laptop)	268	18 (Laptop)	36 (Laptop)	4,040
Jeju	Dominica	190	350	150	150	-	-	150	150	1,140
Gyeongbuk	Guatemala	-	170	250	250	250	150 (New PC)	100	100	1,270
Gangwon	Kenya	200	300	240	320	300	300	335	320	2,315
	Total	3,755	3,867	3,120	2,590	2,153	2,205	1,821	1,955	21,466

### **C. E-ICON International Training and Contest**

The E-ICON International Training and Contest is an e-learning games competition where outstanding teachers and students in the ICT field from home and abroad make up global teams to compete on international cooperation and where the international community get together to create the best e-learning contents. It showcased and demonstrated contents developed in affiliation with 2012 e-learning Korea to about 1,800 distinguished domestic and international guests.

In addition, the overseas expansion of Korean high-tech education services is expected to pave the way for domestic private enterprises to make inroads into foreign markets. In 2012, the government selected Vietnam, Mongolia, the Philippines, Paraguay and the Republic of South Africa as the five preferred partner countries, and then chose the Philippines and Mongolia as priority countries and established innovative ICT-based classrooms. Moreover, it held an international forum for ICT in education in the Philippines. In 2013, it is planning to localize excellent domestic contents, supply additional teaching materials and offer a training course on utilization of educational contents to the two countries where the innovative ICT-based classrooms were set up.

## International Consulting on e-Learning

### 1. Background and Progress

International consulting on e-learning was carried out with an aim to share Korea's experiences and knowhow on its successful cases of applying ICT in education, which was initiated at a national level in close cooperation between the government, research centers, industries and academic institutions to formulate a policy for ICT in education on a national front and develop a strategy to implement the ICT policy based on the mid-and long-term master plans. It started in 2006 to support partner countries to establish ICT in education nationwide. The major business sectors of international consulting on ICT in education consist of eight major fields.

After it established a measure to reinforce a web based education information service called School Net, in 2007, the Sri Lankan government carried out intensive international consulting in 2011. In 2012, the nation's efforts came to fruition as Sri Lanka's education Ministry applied for paid assistance through the Export and Import Bank of Korea under the Ministry of Strategy and Finance. In regard to e-learning, the government has exchanged letters with the partner countries' ministries of education in the first half of 2012 to give intensive consulting at the request of partner countries due to a need for follow-up measures after a policy and technology con-

Table 51.

Progress of ICT Technical Counseling (International Consulting) by Ministry of Education, Science and Technology

Year	Target Country
2006	Uzbekistan
2007	Laos
	Sri Lanka
	Mongolia
	Cambodia
2008	Vietnam
	Thailand
	Uzbekistan
2009	Colombia
	Thailand
2010	Colombia
2011	Sri Lanka

sulting for the Republic of Dominica and Cambodia.

### 2. Major Project Details

In 2012, the government completed the survey on demand for ICT in education by nation for MEST's project for international consulting on ICT in education. Now it has prepared for a measure to enhance teachers' capacity to utilize ICT contents. The project focused on a policy and technical consulting on master plans for the Republic of Dominica and Bangladesh's ICT in education, and reported them to the E-Learning Policy Consulting Committee to win approval.





## X. ICT in Education in the Private Sector

01

### ICT in Education by Private-sector Councils

#### 1. Background and Progress

For the globalization of e-learning, the government is working with 16 metropolitan and provincial offices of education, the Korea Education Research Information Service, the non-profit Korea Education Frontier Association, and other related institutions. Korea took 2011 as the original year to promote Korea's high-tech education service overseas through a private sector council. The country will choose five preferred partner countries among the countries preferred by the Ministry of Education, Science and Technology as exchange partner countries, member countries of Korea Asia Cyber University, and the candidate countries of the infrastructure and pioneer teacher invitation training programs(MOUs with 16 countries) pursued by 16 metropolitan and city offices of education, Then, it will choose two or three priority partner countries among them every year and designate them as high-tech classroom countries every year to build Korea's innovative ICT-based classroom.

#### 2. Major Projects

In 2011, Korea selected Indonesia, Brunei, Colombia, Chile and Kazakhstan as five preferred partner countries. After those countries were chosen, the nation established an innovative ICT-based classroom. In 2012, Vietnam, Mongolia, the Philippines, Paraguay and South Africa were selected as five preferred partner countries as well. Korea plans to build innovative classrooms for the selected priority partner countries.

#### 3. Project Details

After constructing the classrooms, Korea offered lectures on how to utilize high-tech teaching materials utilizing classes and ICT content to help education policy makers, teachers and students of the partner countries maximize the utility of innovative classrooms. In particular, the basic education about ICT learning programs includes the concept of classes using ICT, the status of ICT in education, teaching and learning methods for elementary and secondary education. It conducted education on how to utilize mathematics smart e-learning programs, and educational solutions of science digital supplementary study content and educational software in classrooms.

By offering through the propagation of

Korea's ICT contents and ICT utilization training programs made up of outstanding education ICT contents and enhancing the capacity of policy makers and teachers of partner countries for ICT in education, it is expected that the nation can boost partner countries' demand for Korea's innovative classrooms at a national level.

## Status of E-Learning Industry

### 1. Outline of e-Learning Industry

Thanks to a remarkable development of information technology and infrastructure, e-learning is quickly spreading its presence in the industry, lifelong education and public education. Given this, the national need and industrial importance of e-learning is becoming ever greater. Now, e-learning is moving beyond the early introduction stage to the industrialization stage. In the midst of a rapid change in IT devices driven by the latest smartphones, tablet PCs and smart TVs, and in a great shift in IT media due to the advent of wireless internet IPTV and digital broadcasting, the e-learning industry is quickly evolving into a killer content industry based on smart technology and is expected to establish itself as a knowledge industry.

### 2. Status of E-Learning Market

The market size of e-learning, which is the total expense spent by regular educational institutions, governments, public institutions,

businesses and individuals for e-Learning, was estimated at KRW 2,461.5 billion in 2011, an increase of 10.7% from KRW 2,244 billion won in 2010.

In terms of the ratio of individual consumers by age, teenagers aged between 8 and 19 account for 37.6%, or KRW 410.9 billion, followed by those in their twenties (30.9% or KRW 337.7 billion), 30s (19.5% or KRW 213.1 billion) and 40s (9.2% or KRW 100.5 billion).

The number of those e-learning service providers who ever recorded sales in relation to e-learning contents is a total of 1,656 companies, which is up 6.9% and increased by 107 companies but still slipped down from the previous year's growth rate of 13.2%.

Meanwhile, in relation to the proportion of enterprises by business sector, service providers account for 67.3%, or 1,114 businesses, followed by content producers (22.2%, or 368) and solution providers (10.5%, or 174). In regard to the distribution ratio of businesses by sales volume, the number of those which produced more than KRW 10 billion in sales is 49 businesses, or 3.0% out of the total, followed by those with sales of KRW 5-10 billion (58 or 3.5%).

Table 52. 2011 e-Learning Market Volume (unit: KRW millions, %)

Classification	Total	Individual	Business	Educational Institution	Government and Public Organization
Amount	2,461,516	1,093,016	1,075,645	127,540	165,315
Ratio	100	44.0	43.7	5.2	6.7

### 3. Status of E-Learning in Public Education

Those regular educational institutions which have introduced and operated e-learning as of 2011 account for 82.3%, which is up 0.9 points from the previous year's 81.4%. The spending volume of regular educational institutions is KRW 127.5 billion, which is up 19.5% from the previous year's 106.7 billion.

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