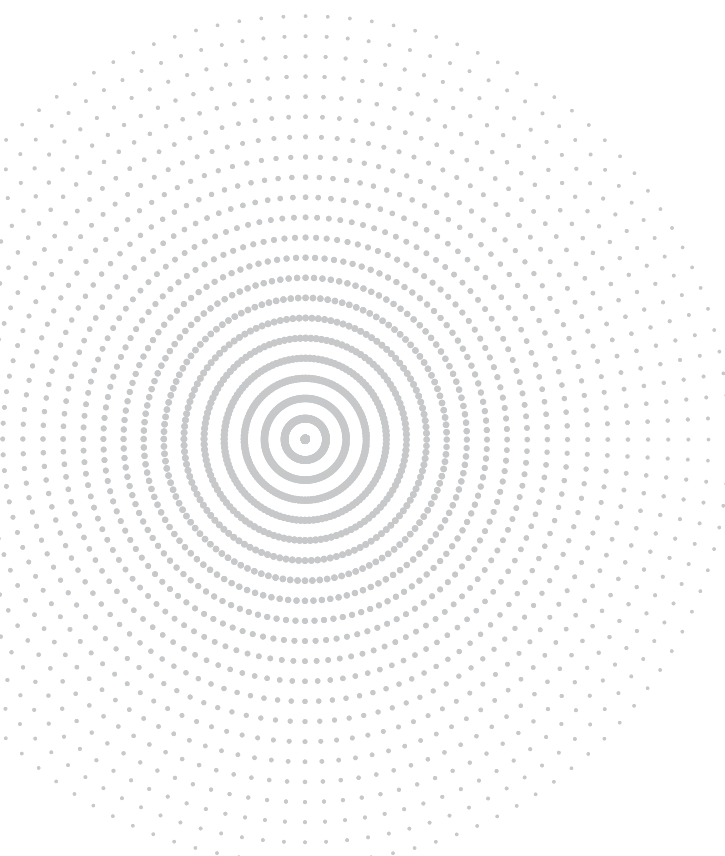


2014 White Paper on ICT in Education Korea

Summary



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Top 10 News Events of 2014

01

'E-childschoolinfo' Site Renovated as a Parent-customizable Information Notification Service

On January 27, 2014, the Ministry of Education (hereinafter referred to as MOE) renovated and improved 'e-childschoolinfo' site to serve as a 'Government 3.0' based information notification service that is customized to meet the needs of parents. 'E-childschoolinfo' allows a parent to easily access information regarding kindergartens based on their interests in 18 different subcategories namely school and after-school curriculums, costs, health and safety maintenance issues, etc. Renovation of the site resulted in significant improvements over its web services and the opening of a smartphone application service. A user can access 'e-childschoolinfo' online and find a list of detailed information on any kindergarten of the user's choosing by using 'Find nearby kindergarten', 'Find Closest-Most popular kindergarten' and 'Summary-Detailed Info' options. The site's search engine allows the user to simultaneously compare and contrast information on four different kindergartens. Kindergartens' locations can be found on an online map. This search option is also available on the smart phone application for users. Furthermore, users may interact with one another using Social Network Services (SNS), sharing and exchanging personal knowledge and experience.



02

Digital Textbook Service Introduced to Schools

MOE, in collaboration with KERIS, began a beta-service phase of digital textbooks to 3rd and 4th year students in elementary schools and 1st year students in secondary schools. As a result, 163 schools' students (81 elementary schools & 82 secondary schools) are currently using digital textbooks for subjects such as Social and Natural Sciences. The digital textbooks were developed based on printed textbooks with various new features incorporated such as multimedia resources and dictionaries, providing the students a more comprehensive and sufficient learning opportunity compared to using digital textbooks alone. They are also easily accessible, capable of deployment on every major Operating System (OS) such as Microsoft Windows, Android, iOS, etc. In addition, 'Wedorang', an online community for digital textbook users, allows the student to have group discussions, collaborate on a group project, submit their assignments and receive teacher feedback. The digital textbooks utilized in elementary schools are national textbooks, having been developed by governmental textbook agencies; the textbooks for secondary schools are government-authorized textbooks, created by 12 different publishing companies (5 for Social Science and 7 for Natural Science) subject to strict government oversight. All digital textbooks were distributed through KERIS. MOE plans to further develop digital textbook policies and roll out improvements based on the final beta-service results and consultations with advisory councils while KERIS seeks to use a number of channels such as EDUNET, SNS, different workshops, etc., to obtain constant feedback from the schools to appropriately respond to the possible need to change operating infrastructure in order to create an enhanced and more efficient digital textbook-friendly environment.



Top 10 News Events of 2014

03

The Information Security and Countermeasure System Reinforced following The Expiration of Official Microsoft Windows XP Security Support

MOE reinforced education and administrative agencies' information security systems following the expiration of Microsoft Window XP technical support on April 8, 2014. From April 8, 2014, MOE's Information Security and Countermeasure Committee (Hereinafter ISCC-MOE) worked closely with the Intelligence Center at the Ministry of Security and Public Aid (Hereinafter IC-MOSPA) to prevent any possible cyber-attacks until the computers were upgraded and/or replaced. ISCC-MOE also encouraged district education offices, agencies and universities to upgrade from the Windows XP OS and replace non-functional computers. In the case of PCs that have not been upgraded from Windows XP, ISCC suggested using a vaccine program from the Korea Internet Security Agency (hereinafter KISA) to prevent cyber-attacks. Moreover, Education Cyber Security Center in KERIS and Personal Data Protection Inspection Team in MOE, increased their surveillance scope and efforts.



04

Over 70 'Infinite Imaginariums' Established in 17 Different Cities and Districts

An 'Infinite Imaginarium' is a space aimed at fostering creativity and imagination. Starting with 17 cities and districts, more 'Infinite Imaginariums' are on the way, and this endeavor shall continue until there are more than one 'Imaginarium' in each of Korea's 227 cities, districts and boroughs. 2014's newly established 'Infinite Imaginariums' are estimated at 70, co-sponsored by MOE, the Ministry of Science, ICT and Future Planning (Hereinafter MSIP), the Ministry of Trade, Industry and Energy (MOTIE) and Korean Intellectual Property Office (KIPO).

In 2014, 'Imaginariums' provided educational programs like DHA and SW Education, etc., and participative programs such as digital device construction workshops and storytelling sessions, plus more. DHA and SW Education using Micro Bit computers were administered in collaboration with MOE's free semester system. 3D printers were distributed to every 'Infinite Imaginarium', allowing the 'Imaginarium' users to experience digital designs and other works. MOE and MSIP established an additional 26 in-school 'Imaginariums' by the end of 2014, including schools in Five West Sea Islands located near the Northern Limit Line (NLL).



Top 10 News Events of 2014

05

'Central Asia Symposium on ICT in Education' Co-hosted with UNESCO

From May 27 to 29, 2014, KERIS and UNESCO co-hosted the 'Central Asia Symposium on ICT in Education' in Tashkent, Uzbekistan.

Education policy makers and administrators from six Central Asia countries (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan and Mongolia) participated in the symposium to discuss the role of ICT in education policies innovation. The symposium is an annual and official meeting sponsored by UNESCO, and this year marked its third iteration since first inception in 2012. UNESCO co-hosted this year's symposium with KERIS, having observed how the Central Asia countries are benchmarking the Republic of Korea's pacesetting ICT in Education policies and unrivaled performance. Through the symposium, KERIS introduced the six nations' education policy makers to NEIS, Smart Education Personnel Training System, and other imperative policy making expertise.



06

KERIS Received the Prime Minister's Award on Information Security Day

On July 9, 2014, the 3rd Annual Information Security Day co-hosted by MSIP, MOSPA and the National Intelligence Service (NIS), KERIS was the honorary recipient of the Prime Minister's Testimonial Award for its contributions in information security advancement. More than 1,500 people attended the ceremony in hope of bringing all citizens together to practice information security and create a safe cyber community. Following the ceremony, the 'Information Security Personnel Recruitment Expo' and 'Information Security R&D Excellence Exhibition' and other commemorative events were held. At the 'International Conference on Information Security', with 'Security First: A Safe Cyber Nation with Security as A Prior' as its theme, many domestic and overseas experts on information security participated in a discussion covering policies concerning cyber physical systems and other significant issues.



Top 10 News Events of 2014

07

Government Reported on Its Plans to Create 'Software-centered Society'

On July 23, 2014, numerous government agencies reported on their 'Strategies to Realize a Software-centered Society'. During the reporting session, MSIP presented a master plan to realize a software-centered society; MOE briefed attendees on plans to vitalize software education in elementary and secondary schools; MOTIE reported on plans to incorporate software in manufacturing businesses; the Ministry of Culture, Sports and Tourism(MCST) announced plans to protect software copyrights and to expand software utilizing infrastructures.

MOE announced that it will proceed to revise software related school curriculums, develop innovative and participative education program software, build support systems to vitalize software education, open institutes for gifted minds in software development and create software-specialized secondary schools. In September, MOE created an integrated curriculum for both liberal arts and natural sciences. The curriculum will throughout incorporate software education and consist of lessons on collecting and analyzing data using computers, developing computational thinking to design and improve problem-solving processes and introductions to software and their various designs. Elementary schools will expand ICT in education contents of Practical Arts classes. Middle schools will remodel its 'Information' class to contain more software-related contents, and change it to become a mandatory course. High schools will revise the contents of its 'Information' class to be more software-centered, and make it a general elective course.



08

MOE Opened Regional Centers of IT Protection Institutes for the Gifted

MOE selected Seoul Women's University, Kongju National University, Daegu University, and Mokpo University as regional centers of IT protection institutes for the gifted. IT protection institutes for the gifted will systematically train secondary school students exhibiting special aptitudes related to information security work; the institute's goal is to raise IT security experts with a strong sense of information ethics and morals (i.e. White Hat Hackers). Each regional center will receive students based on secondary school teachers' recommendations rather than academic scores to identify those students whose natural aptitude and interest lie with IT security. Over 120 hours of free education on IT protection will be provided each year, usually on Saturdays and during vacations. The institute will be divided into three student levels (Novice, Intermediate, Advanced), and each class will consist of no more than fifteen students to guarantee a personalized and intense learning experience. The Republic of Korea's (ROK) leading IT protection agencies such as KISA and AhnLab will provide special assistance to the institute (onsite surveys, special lectures, etc.) while the aforementioned universities' professors will mentor the students, allowing the students to develop their skills and explore their options in the field of information security and protection.



Top 10 News Events of 2014

09

Phase V of the Master Plan for Education Informatization Announced

With the fourth phase of ICT in Education Master Plan having reached its completion, MOE announced the fifth phase of its five-year master plan (2014~2018). Phase V's vision concentrates on 'training creative minds through converging education and ICT', as it aims to lead creative education for the future, support customized education to realize dreams and talents and to provide fair and equal educational opportunities through cooperation and collaboration. As key strategies of Phase V, 'Informatization to catalyze the formation of innovative digital ecosystem through the participation of educational consumers, opening and sharing of public data', 'Customized informatization to process objective and fact-based policy making by utilizing education big data and meet the field's needs', 'Informatization to embrace and care for the marginalized policy areas and/or consumers' and 'Informatization to systematically and efficiently support government, education and IT projects' were set. MOE selected a total of 30 strategic assignments in areas including kindergartens, elementary schools, secondary schools, R&D, lifelong education, welfare, special education, public information infrastructure and the creation of a healthy cyber culture. MOE will lead organized and effective Informatization in Education based on these strategies.



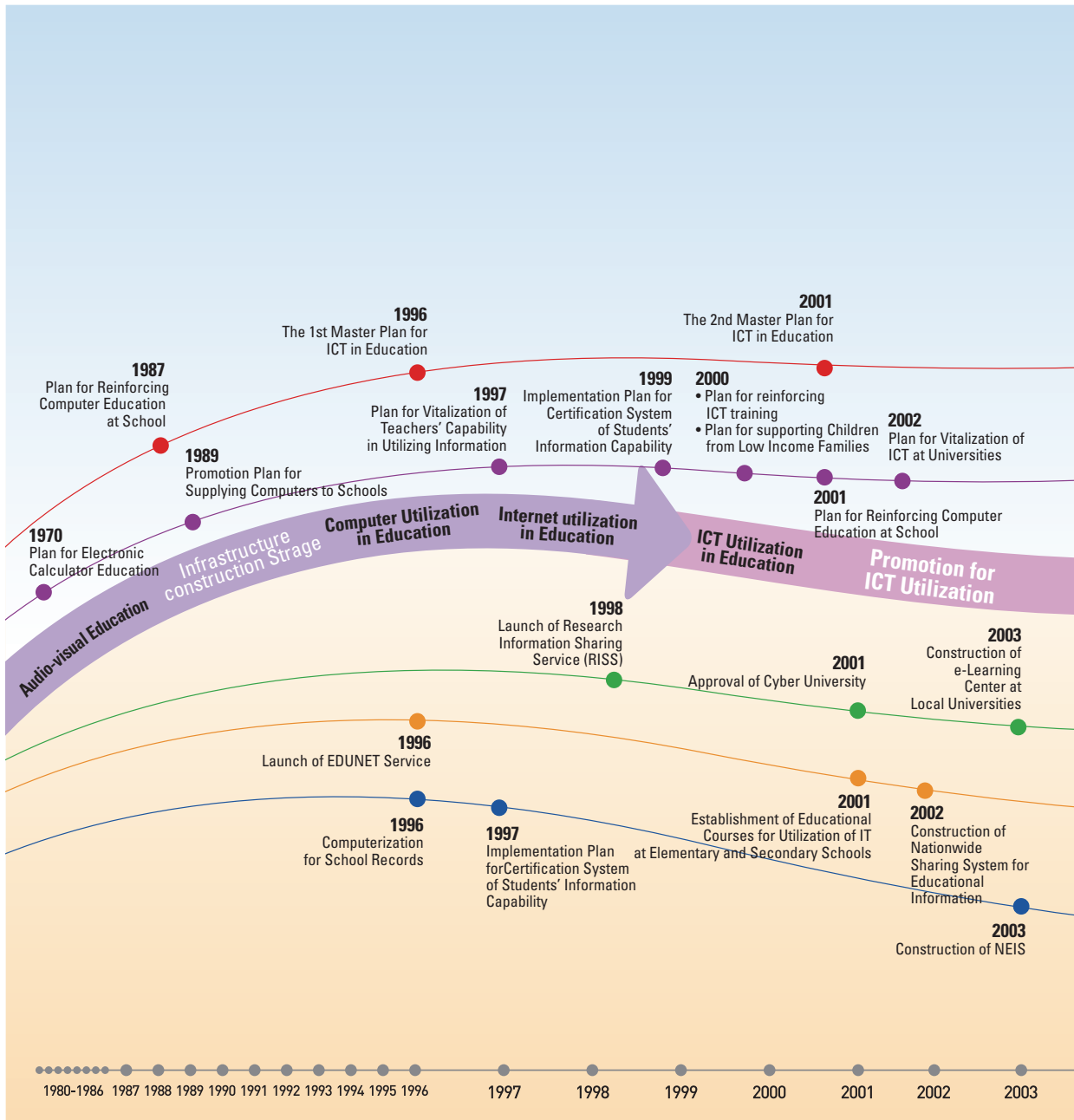
10

An International Symposium on Innovation in Education Co-hosted by KERIS and World Bank

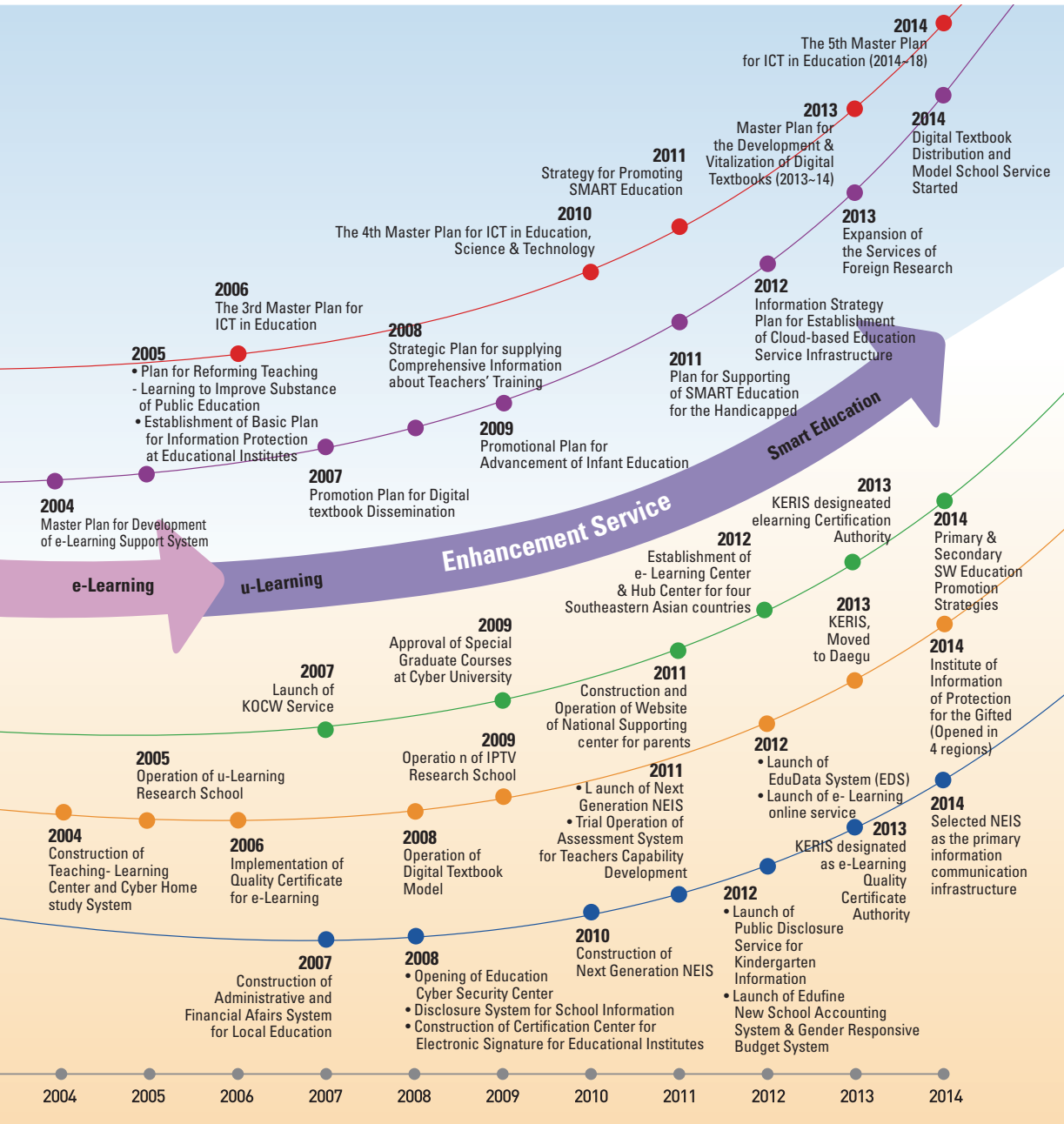
KERIS and World Bank co-hosted a symposium on innovation in education, sponsored by MOE and participated in by Korea Development Institute (KDI), Korea Institute for Curriculum and Evaluation (KICE), Korea Research Institute for Vocational Education & Training (KRIVET), Korea Education and Research Information Service (KERIS) and National Institute for Lifelong Education (NILE) as the symposium's research organizations. The theme of the symposium was 'Achieving HOPE - Happiness of People through Education: Innovation in Korean Education for a Creative Economy'; the symposium was held at the Intercontinental COEX Harmony Ballroom, Seoul, on November 4, 2014; over 300 education researchers, experts and scholars from Korea, the United States, Hong Kong and Singapore gathered to participate in the symposium. During the 'Innovations in Elementary & Secondary Education to Develop Creative Minds' session, various issues in education such as creating a participative learning culture, creating a digital-learning environment converging with ICT, improving the qualities of teaching faculty and designing innovative curriculums were discussed based on research data and forecasts on future trends and prospects. The symposium especially focused on various and alternative ways to raise future leaders with innovative minds and solid morals who would unlock ways to new knowledge and sets of values.



History of ICT in Education at a Glance



2014 White Paper on ICT in Education Korea

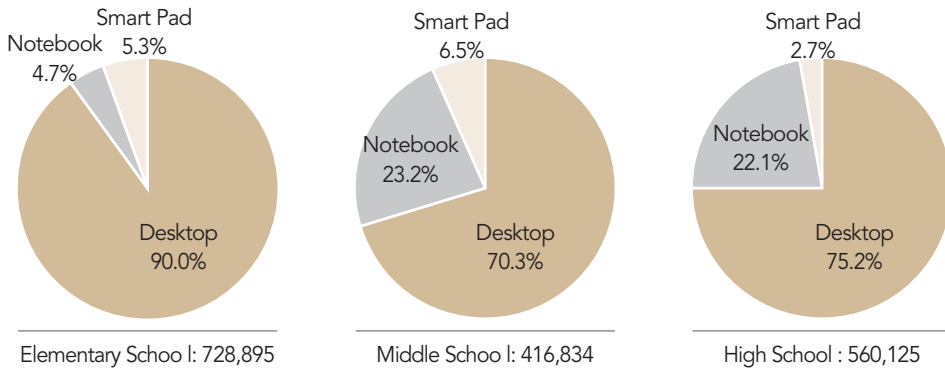


Key Figures of 2014

*KERIS 2014 ICT in Education Survey
- participants: 9,840 schools from 2014.10.1.~ 10.17

1 ICT Infrastructure per School

1. Number of Computers per School

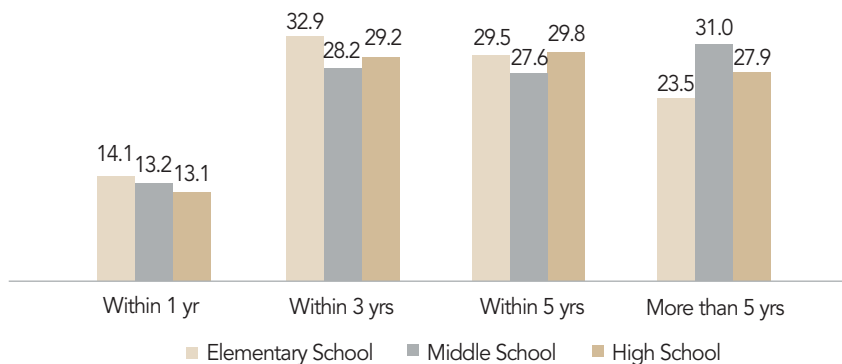


※ Source: KERIS 2014 Education Statistics

2. Desktop Distribution per School Class

(Unit: %)

Classification	Within 1 yr	Within 3 yrs	Within 5 yrs	More than 5 yrs
Total	13.6	30.8	29.2	26.4
Elementary School	14.1	32.9	29.5	23.5
Middle School	13.2	28.2	27.6	31.0
High School	13.1	29.2	29.8	27.9



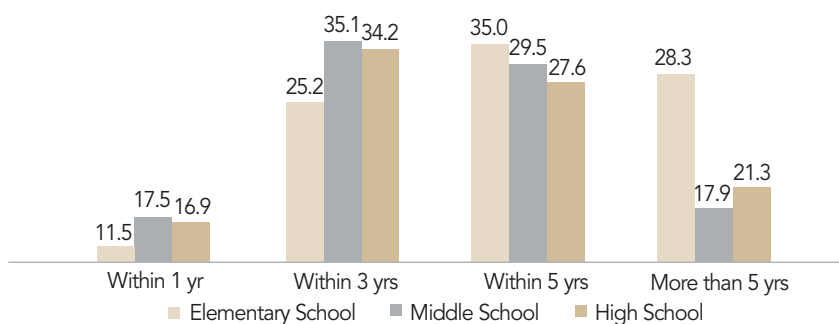
※ Total includes special schools and other schools

※ Source: KERIS 2014 ICT in Education Survey

3. Distribution of Notebook Computers per School Class

(Unit: %)

Classification	Within 1 yr	Within 3 yrs	Within 5 yrs	More than 5 yrs
Total	16.4	33.3	29.3	20.9
Elementary School	11.5	25.2	35.0	28.3
Middle School	17.5	35.1	29.5	17.9
High School	16.9	34.2	27.6	21.3

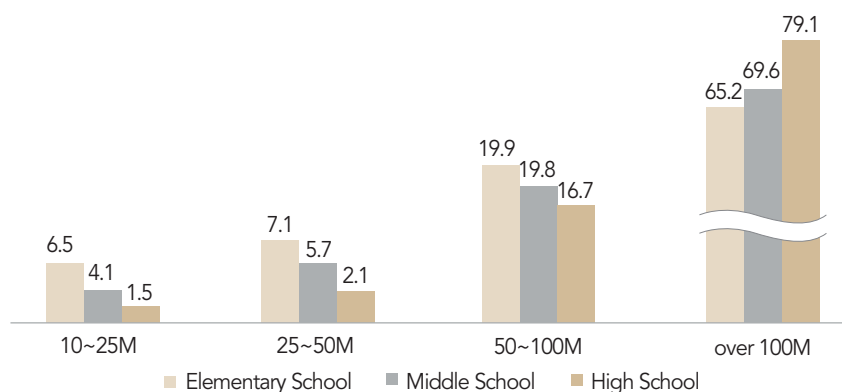


※ Total includes special schools and other schools
 ※ Source: KERIS 2014 ICT in Education Survey

4. Internet Line Speed per School

(Unit: %)

Classification	10~25M	25~50M	50~100M	over 100M
Total	4.8	5.7	19.2	69.2
Elementary School	6.5	7.1	19.9	65.2
Middle School	4.1	5.7	19.8	69.6
High School	1.5	2.1	16.7	79.1



※ Total includes special schools and other schools
 ※ Source: KERIS 2014 ICT in Education Survey

5. Number of Students per Computer

1) Ratio of Students per computer (School Class) (Unit: person)

(Unit : persons)

Classification	Elementary School	Middle School	High School
Number of Students per computer	3.7	4.1	3.3

※ Calculation: (Number of students) divided by (Total number of computers in school)

※ Source: KERIS 2014 Education Statistics

2) Ratio of Students per Computer (Region)

(Unit : persons)

Classification	Elementary School	Middle School	High School
Seoul	4.7	5.0	3.6
Busan	3.3	3.5	2.9
Daegu	3.5	3.8	3.0
Incheon	3.9	4.4	2.8
Gwangju	4.0	4.8	4.2
Daejeon	4.3	4.6	3.5
Ulsan	3.7	4.5	3.6
Sejong	1.2	0.9	1.0
Gyeonggi	4.8	5.9	4.3
Gangwon	2.7	3.2	2.5
Chungbuk	3.0	3.4	2.8
Chungnam	3.2	3.4	3.0
Jeonbuk	2.9	3.3	2.8
Jeolla	2.8	2.6	2.5
Gyeongbuk	2.6	2.9	2.3
Gyeongnam	3.4	3.5	3.3
Jeju	2.6	2.5	3.0

※ Calculation: (Number of students) divided by (Total number of computers in school)

※ Source: KERIS 2014 Education Statistics

3) Number of Students per Computer (School Type)

(Unit : numbers)

Classification	Elementary School	Middle School	High School
national School	3.8	3.1	1.8
public School	3.7	4.1	3.1
private School	4.2	4.3	3.6

※ Calculation: (Number of students) divided by (Total Number of Computers)

※ Source: KERIS 2014 Education Statistics

6. Number of Computer per Faculty

1) Number of Computer per Faculty (School Class)

(Unit : numbers)

Classification	Elementary School	Middle School	High School
Number of Computer per Faculty	1.4	1.4	1.4

※ Calculation: (Number of Faculty Computers) divided by (Number of Faculty Members)

※ Source: KERIS 2014 Education Statistics

2) Number of Computer per Faculty (Region)

(Unit : numbers)

Classification	Elementary School	Middle School	High School
Seoul	1.3	1.4	1.3
Busan	1.5	1.7	1.6
Daegu	1.4	1.8	1.6
Incheon	1.5	1.4	1.4
Gwangju	1.4	1.6	1.5
Daejeon	1.3	1.4	1.5
Ulsan	1.5	1.4	1.3
Sejong	2.3	1.9	2.6
Gyeonggi	1.1	1.0	1.0
Gangwon	1.6	1.6	1.5
Chungbuk	1.6	1.7	1.4
Chungnam	1.6	1.7	1.4
Jeonbuk	1.6	1.7	1.4
Jeolla	1.4	1.6	1.4
Gyeongbuk	1.8	1.7	1.7
Gyeongnam	1.4	1.4	1.4
Jeju	1.8	2.2	2.1

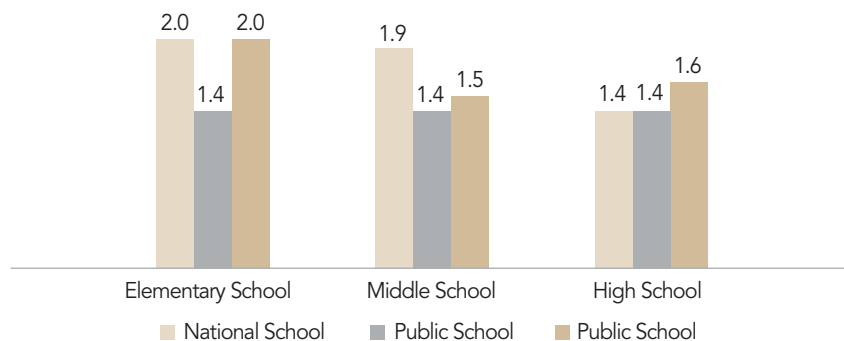
※ Calculation: (Number of Faculty Computers) divided by (Number of Faculty Members)

※ Source: KERIS 2014 Education Statistics

3) Number of Computers per Faculty (School Type)

(Unit : numbers)

Classification	Elementary School	Middle School	High School
national School	2.0	1.9	1.6
public School	1.4	1.4	1.4
private School	2.0	1.5	1.4



※ Calculation: (Number of Faculty Computers) divided by (Number of Faculty Members)
 ※ Source: KERIS 2014 Education Statistics

2 ICT Personnel & Finance per School Class

1) Appointment Rate of ICT Supervisor per School Class

(Unit: %)

Classification	Elementary School	Middle School	High School
Appointment Rate	59.8	78.1	86.4
ICT related major Rate	10.9	18.8	34.4

※ Source: KERIS 2014 ICT in Education Survey

2) ICT in Education Budget

Classification	Elementary School	Middle School	High School
Average Operation Cost per School (in thousand KRW)	793,045	789,965	1,585,322
Average ICT Budget per School (in thousand KRW)	26,922	47,035	42,825
ICT Budget Ratio (%)	3.3	5.9	2.7

※ Calculation: (Average ICT budget per school) divided by (Average operational cost per school)
 ※ Source: KERIS 2014 ICT in Education Survey

3 ICT in Education Statistics

1. Average ICT Training Hours per Teacher

(Unit: Hours)

Classification	Elementary School	Middle School	High School
ICT Knowledge and Application	5.8	5.5	5.3
ICT Ethics and Copyright	1.8	1.8	1.8
Total	7.6	7.2	7.0

※ Source: KERIS 2014 ICT in Education Survey

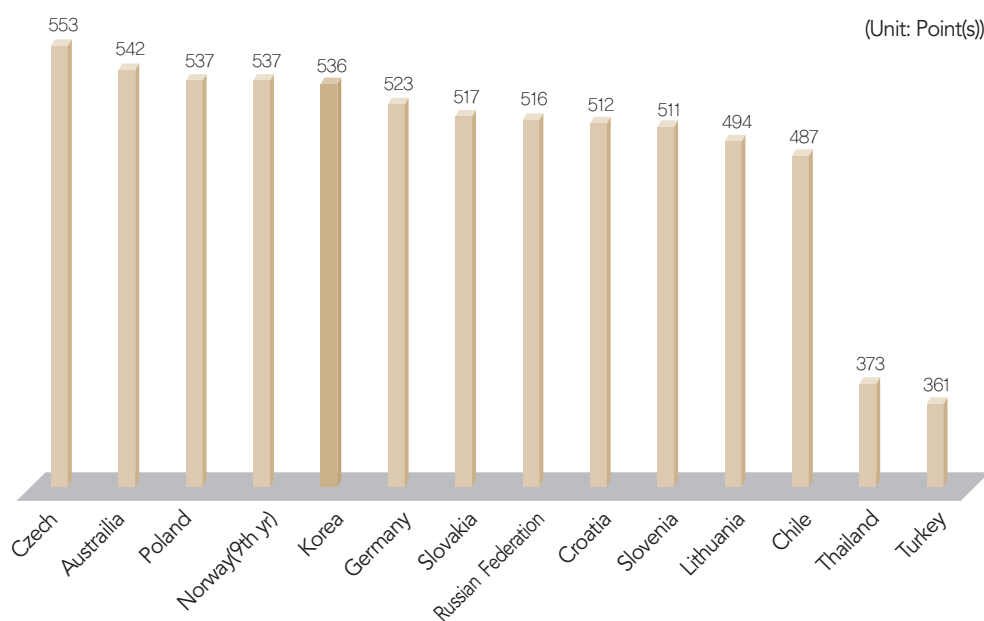
2. Ratio of Students Receiving ICT Education in School

(Unit: %)

Classification	Elementary School	Middle School	High School
Student Ratio	77.0	21.5	35.4

※ Source: KERIS 2014 ICT in Education Survey

4 ICILS 2013 Computer Information Literacy Scores



※ ICILS : International Computer and Information Literacy Study

※ Source: KICE Press Document (2014.11.20)



Feature

Overview

- Chapter 1** ICT in Elementary and Secondary Education
- Chapter 2** ICT in Educational Administration and Finance
- Chapter 3** ICT in Higher Education
- Chapter 4** ICT in Academic Research
- Chapter 5** ICT in Lifelong Education
- Chapter 6** ICT in Career and Vocational Education
- Chapter 7** Bridging the Educational Gap
- Chapter 8** Creation of Healthy Cyber Culture and Privacy Protection
- Chapter 9** International Cooperation and ICT in Private Sector

Master Plan for Education Informatization: Phase V

As Phase IV (2010~2014) of the Master Plan for Education Informatization came to a close, a need for the next generation master plan for education informatization emerged. In response, MOE established new plans that would fulfill the government project of training creative personnel and contribute to education advancement.

The new phase, Master Plan V, for education informatization has two purposes. Firstly, it aims to create an outline in education informatization and develop medium and long-term projects to deal with the rapidly changing economic, social, technological and education environment in ROK and abroad. Secondly, it fosters the global competitiveness of education in Korea.

MOE set ‘Training creative minds through converging education and ICT’ as its vision for education informatization. The ministry also set up three goals to fulfill its vision by creating a student-centered digital education ecosystem; it designed blueprints for future policies, faculty, school culture and services alike.

To complete the vision and purposes of education informatization, 30 strategic subjects and 89 tasks were drawn up into five categories of ① Customized education support system for kindergarten, elementary and secondary schools ② Higher education and academic research to realize a competent-oriented society ③ Lifelong and vocational education connecting education and work ④ Embracing and caring for education welfare and special education ⑤ Building infrastructure to converge education and ICT (administration, finance, laws and other infrastructures). The categorized strategic assignments are shown in [Table 1]

[Table 1] Phase V Strategic Projects in 5 Categories

Number	Categories	Strategic Subject
1	Customized education support system for kindergarten, elementary & secondary schools	1-1 Establish a Curriculum Based Education Information Infrastructure via a Virtuous Cycle
2		1-2 Build a Creative Teaching Support System
3		1-3 Plan and Develop online classes as official curricula
4		1-4 Develop a Customized Career Info Distribution Service
5		1-5 Support an Innovative Teaching & Learning System
6		1-6 Provide an all-access, ubiquitous school environment
7		1-7 Reinforce IT education to foster the gifted in ICT education
8	Higher education & academic research to realize a Competent-oriented Society	2-1 Establish an Advanced Academic Information Distribution System & Global Network
9		2-2 Consolidate Universities' Research & Education
10		2-3 Promote Public Lectures at Universities
11		2-4 Expand sharing & exchanging of university information
12		2-5 Develop 'Study-in-Korea Information System'
13	Lifelong & vocational education connecting education & work	3-1 Disclose Academic Credit Bank Information
14		3-2 Develop an Administrative System to monitor Lifelong Educators
15		3-3 Establish Online Lifelong Education Class Support System
16		3-4 Create a National Competency Standard (NCS) Learning Module Platform
17	Embracing & caring for education welfare & special education	4-1 Establish an Education Welfare System for Students with Disabilities via Improved Special Education Informatization
18		4-2 Strengthen Infrastructure to bridge the information gap for Students with Disabilities
19		4-3 Provide Equal Education Opportunities to Disadvantaged Students
20	Building infrastructure to converge education & ICT (Administration, finance, laws & other infrastructures)	5-1 Improve Information-based Education Administration Work
21		5-2 Expand Customer-centered Public Education Welfare Service
22		5-3 Upgrade an Education Finance & Administration Management System
23		5-4 Improve Education Finance & Administration Infrastructure Management
24		5-5 Develop a Preschool Education Information System
25		5-6 Manage a Higher Education Information Support System
26	Other infrastructure, laws, & systems	5-7 Operate Big Data via EduData System & EduData Statistics System (EDS, EDSS)
27		5-8 Establish Standardization & Quality Management Foundation
28		5-9 Promote Healthy & Safe Cyber Culture
29		5-10 Globalize Korean Model of Education Informatization
30		5-11 Strengthen R&D in Education & Performance Management

1. Customized Education Support System for Kindergarten, Elementary and Secondary schools

The Kindergarten, Elementary and Secondary schools section set its main goal as 'Creation of Happy School via innovative ecosystem by converging education and ICT' and developed the following strategic subjects: ①Creating an education information virtuous cycle system founded on curricula ②Developing an innovative Teaching and Learning Support System ③Planning and activating online classes ④Building a customized career information distribution service ⑤Enhancing

Teachers' teaching and learning competence training ⑥Providing an all-access, ubiquitous school environment ⑦Reinforcing ICT education to foster gifted students.

2. Higher Education and Academic Research to Realize a Competent-oriented Society

The Higher education and academic research section set its main goal as 'Formation of a virtuous cycle system of knowledge via establishing higher education, academic research, sharing and distribution infrastructure' and developed the following strategic subjects: ①Establishing an Advanced Academic Information Distribution System and a Global Network ②Consolidating Universities' Research and Education ③Promoting Public Lectures at Universities ④Expanding sharing and exchanging of university information ⑤Develop 'Study-in-Korea Information System' (<http://www.studyinkorea.go.kr>)

3. Lifelong and Vocational Education connecting Education and Work

The Lifelong and vocational education section set its main goal as 'Realize Happy Lifelong Learning via Online Lifelong Study: Connecting Education and Work, and Bridging the Educational Gap' and developed the following strategic subjects: ①Disclose Academic Credit Bank System (ACBS) Information ②Develop an Administrative System to monitor Lifelong Educators ③Establish Online Lifelong Education Class Support System ④Create a National Competency Standard (NCS) Learning Module Platform.

4. Embracing and Caring for Education Welfare and Special Education

The Education welfare and special education section set its main goal as 'Manifest Happy Education to Disadvantaged Students and Students with Disabilities by Developing a Customized Education Welfare Support System' and developed the following strategic subjects: ①Establish an Education Welfare System for Students with Disabilities via Improved Special Education Informatization ②Strengthen Infrastructure to bridge the information gap for Students with Disabilities ③Provide Equal Education Opportunities to Disadvantaged Students.

5. Building infrastructure to Converge Education and ICT (Administration, finance, laws and other infrastructure)

The ‘Building a System to Converge Education and ICT’ section configures and designs plans based on the pertinent environment to facilitate and support ICT in education. Its goal is to ‘Alleviate Teachers’ Work via an Expedient and Useful e-Learning and Finance Service’; it also developed strategic subjects, which are concentrated on areas of education administration, finance, laws and other infrastructure. The following are the strategic subjects in the areas of education administration and finance: ①Improve Information-based Education Administration Work ②Expand Customer-centered Public Education Welfare Service ③Upgrade an Education Finance and Administration Management System ④Improve Education Finance and Administration Infrastructure Management ⑤Create and Run a Preschool Education Information System ⑥Manage a Higher Education Information Support System

The strategic subjects in the areas of education laws and other infrastructure include: ⑦Operate Big Data via the EduData System and EduData Statistics System (EDS & EDSS) ⑧Establish Standardization and Quality Management Foundation ⑨Promote Healthy and Safe Cyber Culture ⑩Globalize the Korean Model of Education Informatization ⑪Strengthen R&D in Education and Performance Management.

6. Future Prospects

For the next five years, the Phase V Master Plan is expected to act as a compass for decision-makers by offering a vision for education informatization and the best pathways leading into the future for elementary and secondary schools, higher education and academic research fields, lifelong and special educations, etc. In addition, Phase V will be the basis for policy making and direction planning related to ICT in education. It is also expected to promote the acceleration and systematization in ICT in education by working in conjunction with central government, local and district offices of education and other related agencies. Moreover, Phase V could be used for basic data and as an evaluation tool to reveal future projects for 17 city and district offices of education, ICT in central government, ICT in universities and ICT in lifelong and special education.

Overview

Section 1. ICT in Education: Policies and Outcomes

1. ICT in Education: Policies

ICT in education in Korea can be categorized into four phases of development: Phase I, Foundation Establishment (1996~2000); Phase II, Dissemination and Settlement (2001~2005); Phase III, Advancement (2006~2010); Phase IV, Education Converged with Technologies (2010~2014). Each phase's main outcomes are shown in [Table 2].

[Table 2] Master Plan: Phase I to IV

Classification	Areas	Main Outcomes	Characteristics
Phase I Foundation Establishment (1996~2000)	<ul style="list-style-type: none"> · Building Infrastructure · Develop & Distribute Education Information Resources · Enhance IT Education · Digitalize Education Administration Information · Enrich R&D Information Foundation 	<ul style="list-style-type: none"> · Developed Stable Foundation for Implementing ICT Education Infrastructure (KERIS, EDUNET, RISS) · Built World-class ICT Infrastructure & Reinforced Information Accessibility 	<ul style="list-style-type: none"> · First Long-term Comprehensive Plan of ICT in Education · Linked to Informatization Advancement Master Plan
Phase II Dissemination and Settlement (2001~2005)	<ul style="list-style-type: none"> · Adapting to Information-Based Society · Create innovate workforce · Promote Partnering Information Culture · Develop Comprehensive Performance Management System 	<ul style="list-style-type: none"> · Successful Implementation of ICT Education · Universalization of e-Learning · Advancements in NEIS e.g. Improved Education Administration · Scholastic Information Distribution Service Enhanced 	<ul style="list-style-type: none"> · Lifelong Education & Healthy Information Culture included · Informatization Indicators Developed

[Table 2] Master Plan: Phase I to IV

Classification	Areas	Main Outcomes	Characteristics
Phase III Advancement (2006~2010)	<ul style="list-style-type: none"> · Develop Innovative e-Learning&Lifelong Learning Systems · Founded e-Education Safety Net & Knowledge Management System · Globalization of e-Learning&Learning Infrastructure · Establish e-Education Administrative Support System · Manage Performance & Quality of ICT in Education 	<ul style="list-style-type: none"> · Every School Supplied with Planned ICT Infrastructure · ICT Education Reinvigorated · NEIS Service Opened · Every Aspect of Education now Connected to ICT 	<ul style="list-style-type: none"> · Globalization of e-Learning&Performance Management of e-learning · Transition of Informatization Projects to Regional & Local Agencies (90%)
Phase IV Education Converging with Technology (2010~2014)	<ul style="list-style-type: none"> · Foster the Innovative& Digitally Gifted · Reinforce Advanced R&D Capabilities · Informatization of Communication& Convergence · Establish Information Infrastructure of Education Science & Technologies 	<ul style="list-style-type: none"> · Smart Education Introduced& Applied · Future Education Research & Trial Operation · EduFine & EDS Services · Informatization of Preschool Education 	<ul style="list-style-type: none"> · Readjusting & re-evaluating Master Plans' Time & Scope upon integration of MOE · Instituted Comprehensive Master Plan in Education & Science Sectors
	(Smart Education Strategic Subjects) <ul style="list-style-type: none"> · Digital Textbooks Developed · Strengthen Online Class Performance & Evaluation · Create Accessible & Free Education Content Environment · Enhance Teachers' Smart Education Competencies · Developed Cloud Education Service System 	<ul style="list-style-type: none"> · Digital Textbook Infrastructure Management & Pilot Development · Online Classes Activated · Resolving Copyright Issues with Educational Content · Enhance Teachers' Competencies · Establish Cloud-based Education Service 	<ul style="list-style-type: none"> · Domain Enlarged: Education Systems Transformation · Limited to Primary & Secondary Education

Phase I, Foundation Establishment (1996~2000), laid the foundation for education informatization in which the hardware and software infrastructure required for its implementation as well as the various governmental organizations and agencies to carry out the informatization in education were created.

Phase II, Dissemination and Settlement (2001~2005), contributed to the enhancement of hardware infrastructure of education informatization completed in Phase I and ultimately the remarkable amelioration of the quality of public education by means of ICT such as EBS classes and Cyber family learning. It established NEIS and other systems to maximize education administration's effectiveness. MOE also made significant advancements in the circulation of scholastic information to secure quality academic and research information; MOE also pursued various projects to bridge the educational gap in information.

Phase III, Advancement (2006~2010), during which the Internet environment shifted to wireless, education informatization policies also shifted from e- to

u-learning, as the e-learning system was enhanced and adjusted to field-based informatization. The scope and content outgrew existing goals focusing on quality improvements of public education by aiming towards education informatization that would help lead to educational innovation such as ubiquitous learning environments, model projects and international cooperation and informatization support for disadvantaged students and students with disabilities. Also, to refine ICT in education policies and services, EDUNET, RISS, and u-Learning model Schools were operated; digital textbooks became commercialized; e-Learning standardization and quality management services were reinforced; improvements in advanced R&D activities were made; globalization of Korea ICT in Education contents (e-learning exports) underwent experimentation.

Phase IV, Education Converging with Technology (2010~2014), introduced the concept of ‘Digitalized Learning and Research Ecosystem’, a systematic and technical platform where numerous agents can organically participate in projects and collaborate with one another. Based on the Master Plan of ICT in Education, Phase IV made adjustments to policies to better accommodate government’s focus on fostering ‘Soft Power’ rather than the pre-existing infrastructure. Creating a Digitalized Ecosystem marks the conversion from central government-led policies to compartmentalized governance; it also provides an instrument for Data Based Informatization policies.

The Ministry of Education and Science Technology (MEST) presented 4 major categories, 21 strategic subjects and 60 detailed tasks to specifically execute the Master Plan (Kindly refer to [Table 3] below).

[Table 3] Master Plan’s Strategic Subjects in 4 Categories

Categories	21 Strategic Subjects
Foster Innovative Minds based on ICT in Education	<ul style="list-style-type: none"> · Develop advanced U-Learning System · Establish Safe School Environment & instill mature civic awareness · Bolster soft power · Introduce leading education support system · Support teachers’ competency advancement · Fulfill Happy Society via ICT in Education · Connect School-Work-Life · Enhance R&D for Future Education · Reinforce e-Learning Global Partnerships
Enhance Advanced R&D Capabilities	<ul style="list-style-type: none"> · Upgrade National Science & Technology Information Service (NTIS) · Develop sustainable R&D information utilization system · Build National & International Science&Technology Information Networks · Creation of Value Added Research & Service Development · Encourage & promote IT Culture to citizens
Informatization of Communication & Convergence	<ul style="list-style-type: none"> · Provide next-generation IT converged education & research service (EDISON) · Establish open Access-based R&D cooperation platform
Establish Education & Science Technology Informatization Infrastructure	<ul style="list-style-type: none"> · Restructure clean & green IT based school infrastructure · Enhance education administration information service · Build next-generation cyber R&D infrastructure · Establish information protection system to bolster ICT in education · Enact & amend information laws&construct informatization infrastructure

2. Implementation Plan

As part of government's restructuring on March 23, 2013, the education sector was separated from the Ministry of Education, Science and Technology (hereinafter MEST) and hence became the Ministry of Education (MOE). In processing education informatization, MOE is organically collaborating with affiliated institutions, universities, city and provincial offices of education and other related organizations.

MOE will develop general policies of ICT in education, oversee and regulate the entire project; city and provincial offices of education will lead informatization projects in kindergarten, elementary and secondary education; universities will run the informatization projects in higher education; affiliated organizations, according to each organization's tasks and functions, will support informatization services in various areas such as kindergarten, elementary and secondary education, higher education, special and lifelong education, vocational education, international cooperation, faculty training and more.

[Table 4] MOE Informatization Implementation Plan

Classification	Main Roles
Ministry of Science, ICT & Future Planning (MISP)	· Oversee National Informatization Policies
Ministry of Education (MOE)	· Oversee Education Informatization Master Plan
Universities	· Plan & Execute Informatization Projects in Higher Education
City & Provincial Offices of Education	· Plan & Execute Informatization Projects in Kindergarten, Elementary & Secondary Education
Affiliated Organizations	· Support MOE, Universities, City & Provincial Offices of Education · Plan & Execute informatization projects assigned to each organization

Section 2. ICT in Education: Laws and Institutions

Based on Government 3.0 policies, there has been an increase in the type and amount of public information that education institutions collect and manage. The implementation of the Privacy Act in August of 2014 means that education institutions must find alternative resources for the already collected social security numbers that are unwarranted by the Privacy Act. The Korean government established an ICT Promotion and Convergence Master Plan based on the Special Act for ICT Promotion and Convergence (hereinafter 'ICT Promotion Act'), enacted in 2013. Also, as part of promoting the domestic software industry, software education will

be further reinforced in school curricula.

Basic legislation in the field of education and research-informatization is rooted in the Basic Act on Education, Scientific Research Promotion Act, Basic Act on National Informatization and the like, while detailed legislation incorporated in conjunction is independently provided as required based on the aforementioned three acts. The reason behind changes in the legal system of ICT in Education can be attributed to legal and governing infrastructures that are constantly affected by changing trends in ICT fields and culture.

2014 Education Informatization Law trends can be summarized into three categories namely:

1. Reinforcing Information Offerings based on Government 3.0

There are three main strategies to propel the Government 3.0 project namely: transparent government to increase quantity and improve quality of public information, and to find and assess more data for public disclosure; able government to enhance inter-agency cooperation and communication, and construct Big Data based administration; government servicing to seek the customization of every governmental policy, various projects and services to better accommodate Korean citizens' needs. Working in liaison with Government 3.0 plans, MOE will increase the number of education institutions that disclose information according to the Special Act on Education Institutions Information Disclosure, and refine the list of disclosed information, methods and procedures, etc. Moreover, MOE will also accelerate the disclosure of education and scholastic information via EDSS and RISS; accumulate life cycle customized information; provide for the collection of education Big Data via NEIS and customized services to its users.

2. Responding to Privacy Acts Amendments

Recent amendments to Privacy Acts, with regard to collecting social security numbers (SSN) are lawfully forbidden unless the collecting agency is able to provide a special legal provision. Henceforth, unnecessary collection, managing and dealings in SSN's are strictly prohibited; in the event of any violation, a fine of KRW 30 million or less may be handed down if found guilty. Also the amendments decreed the compulsory termination of all collected SSN data void of the required lawful provision by August 6, 2016. As a result, MOE, city and provincial offices of education, schools, educational institutions, and education-affiliated businesses will all have to securely terminate their SSN data by 2016. In order for registration on the parties' websites, the collection agency must use alternative methods of personal

identification such as I-PIN (Internet Personal Identification Number) or My-PIN.

3. Fostering a Professional Workforce by Invigorating Elementary & Secondary Software Education

ICT Promotion Special Act Amendments 11 and 12 require the implementation of a school-approved internship program to foster a professional workforce for the IT industry. In response, MOE initiated 'Primary and Secondary School Software Education Project'. Accordingly, primary schools' information-related learning will be reorganized as an introductory class on software; in middle school, the current 'Information' course will be transformed to a 'Software' course; in high school, the 'Information' course, at present a secondary elective, will be substituted to 'Information' as a general elective course instead.

Furthermore, the 2015 curriculum development of converging liberal arts and natural sciences will reflect diverse opinions from the education sector; curriculum software education will be systematized to meet the demands of local schools. Also, an information protection institute for the gifted will be established and run in order to systematically train promising middle and high school students to develop into able information protection specialists (i.e. White Hat Hackers) with irreproachable information ethics and morals.

Section 3. ICT in Education: International Trends

1. North America

The United States of America is preparing a project to install the next generation broadband and wireless Internet in schools. The project will allow every student to have Internet access, and it will help train the students to excel in the Digital Age as individuals. Corresponding to the project's theme, digital resources and teacher training programs are additionally being developed. Moreover, other projects such as BYOD (Bring Your Own Device), One-on-One computing (1:1 Computing) and Flipped Learning are being experimented with and expanded throughout the USA. Meanwhile, Canada is continuing a project that supplies computers to schools in relation to a current youth employment program.

2. Europe

ICT Education is shifting in focus to programming education that cultivate logic and understanding of interaction between humans and computers; and is resulting

in an increase of coding education. The UK, Estonia, France and others have introduced Coding Education as a regular and/or optional subject; various ongoing efforts to digitalize schools have taken place, including the 'Opening up Education' project, which concentrates on utilizing Open Educational Resources. Meanwhile, the 'iTEC' project, which has been promoted over the past four years, has acquired a positive evaluation as it offered a new educational tool and resources to students, teachers and class.

3. Asia

In Asia, Singapore, Korea and Japan are leading countries in the computer per student ratio; Taiwan, Hong Kong, Singapore, Japan and Korea are leaders in knowledge-based economic development. Japan is concentrating on digitalizing textbooks while China is running model digital book tests and research in and around Beijing, Shanghai and other major cities. Japan, the Philippines, Hong Kong and Taiwan are trying to establish education systems that better utilize ICT.

4. Oceania - Latin America

Australia is supporting ICT applications in schools via online evaluations, NBN programs and a national school interoperability program. In particular, the state of Queensland achieved notable results using a one-on-one program called BYOx (Bring Your Own 'x'), a modernized version of BYOD. New Zealand is continuously developing 'Network for Learning' managed networks and the 'School Network Upgrade Project' and there has been a rapid expansion of the e-Learning market in Latin America.

5. Middle East - Africa

The United Arab Emirates is running the Mohammed Bin Rashid Smart Learning Program, a comprehensive smart learning program. The government of Kenya is pushing for a laptop computer distribution project.

6. International Organizations

UNESCO announced in resolution 37C/4 2014-2021 Medium-Term Strategy to work to expand learning opportunities using mobile devices and ICT. As part of its strategy, UNESCO is working on the 'Youth Mobile Initiative', a program encouraging youths to acquire programming skills; UNESCO is also supplying mobile devices to developed countries to augment mobile learning. World Bank, according to its 'World Bank Education Strategy 2020', is supporting various

programs such as the mobilization of ICT equipment and facilities, teacher training, competency development, educational contents development, distance learning systems, digital literacy programs, policy making, monitoring and evaluation, media outreach and more. Meanwhile, the African Development Bank (AFDB) has selected ‘Human Capital Strategy’ to accelerate regional competitiveness and job creation via technological development and the effective application of ICT.

[Table 5] International Trends in ICT in Education

Region	Main Projects
North America	<ul style="list-style-type: none"> USA: installation of the next generation broadband and wireless Internet in schools. Other projects such as BYOD, 1:1 Computing and Flipped Learning are undergoing experimentation and expansion Canada: continuation of supplying computers to schools in relation to youth employment program
Europe	<ul style="list-style-type: none"> The UK, Estonia and others have introduced coding education Ongoing efforts to digitalize schools have taken place in numerous countries The EU executive committee started ‘Opening Up Education’, a new project emphasizing the expansion of OER applications European School Net evaluated the ‘ITEC’ project and released an online specialized development course platform for teachers
Asia	<ul style="list-style-type: none"> Singapore, Korea and Japan lead the computer per student ratio; Taiwan, Hong Kong, Singapore, Japan and Korea lead knowledge-based economic development Japan: developing its own digital textbook project China: model digital book tests and research being carried out in and around Beijing, Shanghai and other major cities Japan, the Philippines, Hong Kong and Thailand are working to establish educational systems to better utilize ICT
Oceania · Latin America	<ul style="list-style-type: none"> Australia: supporting ICT activities in schools through various programs; assessed performance of the ‘BYOx’ project New Zealand: working on N4L Managed Network and School Network Upgrade project Latin America: Costa Rica is pushing to provide Internet access to every public school; overall, Latin America’s e-learning market is rapidly expanding
Middle East · Africa	<ul style="list-style-type: none"> The UAE: developing comprehensive smart learning Kenya: laptop supply and distribution project
International Organizations	<ul style="list-style-type: none"> UNESCO: committed to mobile education and educational use of ICT in its new long-term strategies; developing ‘Youth Mobile Initiative’ to improve coding techniques and other mobile learning projects World Bank: the 2020 WB education strategy set ‘Learning for All’ as its main goal; focuses on improving quality in education, providing education opportunities and increasing graduation rates; pursuing universal primary education and gender equality in the education sector; and is also supporting various educational activities involving ICT AFDB: developing its ‘Human Capital Strategy’ to accelerate regional competitiveness and job creation via technological development and effective application of ICT

ICT in Elementary and Secondary Education

Section 1. Policies of ICT in Education

1. Status of Informatics Curriculum

A. Status of Informatics Curriculum in Elementary and Secondary Education

1) Curriculum Change in Informatics and Other Related Subjects

ICT education in Korea commenced with the introduction of computer education, as part of the 3rd National Curriculum, to the subject of Technology for general high schools back in 1974. Subsequent to that, it had extended its scope from 1981, as part of the 4th National Curriculum, when the contents of electronic calculators and computer algorithms were introduced to the subject of Industrial Technology and Mathematics respectively, then further spread out in effect over all the grades of elementary, middle and high schools in 1987 when the 5th National Curriculum was introduced. Throughout the 6th National Curriculum that commenced in 1992, computer-related content was systemically factored into Practical Arts, Technology, Industry and Technology for elementary, middle and high schools respectively, once the 7th National Curriculum commenced in 1997, the curricula were reorganized for students to adequately make use individual skills in ICT through all subjects including but not limited to the aforementioned Practical Arts, Technology and Industry and Computers etc. With the 2007 Revised National Curriculum introduction, information-related subjects changed in terms of names and contents.

2) Information-related Curriculum for Elementary, Middle and High Schools(Subsequent to the 2009 Revised National Curriculum)

The 2009 Revised National Curriculum has, inter alia, amended the existing National Common Curriculum, which at the time was targeted towards the 10th grade and below, to the Common Curriculum that is aimed at the 9th grade, introduced the Grades Cluster and Subjects Cluster system and the newly adopted Intensive Course-Taking system as well as Creative Experimental Activities.

For the purpose of a subject, information-related content could be taught in Practical Arts in elementary schools, Technology and Home Economics and Information in middle schools, and Information in high schools. In addition, both informatization and information ethics education were selected as themes for Cross Curricular Learning with the purpose of integrated education throughout overall educational activities including any relevant subject and Creative Experimental Activities.

[Table 6] Curricula for Elementary, Middle and High Schools

Classification	Subject	Domain	Contents
Elementary School	Practical Course (Grades 5~6)	Life & information	<ul style="list-style-type: none"> IT devices & cyber space Production & use of multimedia materials
Middle School	Technology & Home-keeping (Grade 1~3)	Information & communication technology	<ul style="list-style-type: none"> The world of ICT Computer & Communication technology Information & Communication technology experience & Problem solving activities
		Information science & Information communication ethics	<ul style="list-style-type: none"> Information science & Information society Ethical use of information The side effect of information society & preparation plans
	Information (Optional courses)	Configuration & Operation of information device	<ul style="list-style-type: none"> Composition & Operation of a computer Understanding of the operating system Understanding of the network
		Representation & Managements of information	<ul style="list-style-type: none"> Data & Information The binary representation of the information Structuralization of information
		Problem solving methods & procedures	<ul style="list-style-type: none"> Problem Solving Trouble shooting procedures The basis of the programming
High School	Information (Optional courses)	Information science & Information communication ethics	<ul style="list-style-type: none"> Information science & Information society Ethical utilization of information The side effect of information society & preparation plans
		Configuration & Operation of information device	<ul style="list-style-type: none"> Composition & Operation of a computer Understanding of the operating system Understanding of the network
		Representation & management of information	<ul style="list-style-type: none"> Efficient representation of information Structure of data & Information Information management
		Problem solving methods & procedures	<ul style="list-style-type: none"> Problem solving strategies Programming The application of the algorithm

3) 2015 Converged Liberal and Natural Science Curriculum

In the 21st century, there has been an increasing demand for Computational

Thinking due to rapid advancements in informatization; MOE has made ‘Software Education’ (Hereinafter SE) a compulsory class from 2015 via the Converged Liberal & Natural Science Curricula. SE’s curriculum will comprise instruction on cyber copyright protection, personal information protection, information ethics, basic understanding of software and coding language, primary ICT principles and their applications.

Primary schools will include software related contents in the information section of Practical Arts classes. Middle schools will reorganize ‘Science and Technology’ subjects into ‘Science, Technology and Family’ subjects; ‘Information’, an elective course, will be revised around software learning and convert to a compulsory course. Lastly, high schools will reorganize ‘Information’, a secondary elective, as a general elective and also restructure its curriculum to center on software learning.

B. ICT in Education: International Trends

Currently, computer science is being used in nearly every aspect of human life; such is the profound impact that IT science has on today’s society. Many IT leading countries have recognized the significance of computer science, and have adjusted computer education to focus more on academia, shifting from general ICT education.

1) IT & Computer Education in the USA

The City of Chicago (USA) recently announced that ‘computer science’ will be a compulsory course as per High School Curricula; Massachusetts State included computer science in its 8th grade curriculum and also incorporated a ‘Technology and Engineering’ category in statewide evaluations in its school education system.

The American Association for Computing Machinery (ACM) and Computer Science Teachers Association (CSTA) offer IT curricula that incorporate computational thinking, collaboration, computing practices and programming, computer and communications devices; the curricula for these subjects are structured to best fit student ages and knowledge.

2) IT & Computer Education in the UK

Since September 2014, the UK started teaching a computing class in place of the prior ICT class to every student aged 5 to 14 years old. Computing will be a part of the national curricula, and will impart computer programming. Students will learn coding mechanisms and practical computer problem-solving skills, moving beyond merely using computers for working and studying.

The main contents of this computing class include algorithms, programs, programming, debugging, logical reasoning, the creation of digital contents, understanding IT, designing and revising coding, computer networks, choosing software, abstraction, computational thinking, Boolean Algebra, hardware, software, online privacy and protection, etc.

3) IT & Computer Education in India

The Indian government started including computer education more than a decade ago, but is still struggling to provide a comprehensive and uniform curriculum. Computer Master Curriculum (CMC) acts as a national guideline that addresses the aforementioned problem of computer education in India, and it has been presented three times leading up to June 2013. CMC was founded on the philosophical principles of developing students' computer literacy, enhancing problem-solving skills and emphasizing interdisciplinary relations and their relevance.

India's revised curricula can be characterized by the emphasis on thinking processing skills, computer literacy integrated with fundamental concept and thinking skills, thematic integration, and spiral curriculum and scalability.

2. Teacher Informatization Training

A. Teacher Competence Development Support Project

The MOE has, rendering teachers the opportunity to improve their competencies, pushed ahead with a variety of projects including the advancement of teachers' skills in information utilization; education of ICT knowledge and pertinent utilization; extension of customized training programs; and reinforcement of international cooperation with regard to teachers' competence development. The projects' history and outcomes are as follows.

1) Project Progress: 2009~2013

Since 2012, with the advent of Web 2.0, the MOE has also materialized, via its Smart Education Project, an intelligent, customized teaching and learning system that integrates ICT with education. In 2013, it established the 'Plan for Digital Textbook Development' and its Activation connected to the National Agenda, Building the Textbook-Completion Learning System void of Reference Books with the deliberate intention to, via the development and distribution of digital textbooks, materialize textbook centered learning circumstances that allows ubiquitous self-directed learning.

In addition, 'ICT Symposiums' have been held annually since 2007 to reinforce Teacher informatization competency; Teacher Training Information Service (TTIS) was opened in 2009; and in 2012, Smart Education Teacher Training Accreditation System was created. In June 2011, 'Smart Education Implementation Strategies' were developed to run digital textbook and smart education policies more efficiently. In May 2013, the Teacher Informatization Competence Development Project was developed to focus on the reinforcement of teachers' competence for the sake of the application and dissemination of digital textbook-aided teaching and learning.

2) 2014 Project Overview

The 2014 Teacher Competence Development Support Project, subsequent to the previous year's program, emphasized the bolstering teachers' competence using digital textbooks. Firstly, the 2014 project carried out digital textbook and smart education training for existing teacher trainers and newly recommended teachers. Secondly, it supported 14 national curriculum research committees and 34 regional curriculum research committees to develop and distribute class protocols utilizing digital textbooks and smart education. Thirdly, it developed an online and a mobile diagnostic tool via EDUNET to allow teachers to do self-evaluations in terms of smart education competence and receive teacher feedback. Fourthly, it began to develop an advanced integrated study and learning center site to improve preliminary teachers' informatization competence. The project also continued with its research and training program involving 144 research schools in 2013 and 163 in 2014 with the hope of improving the quality of digital textbooks and to substantiate research school management. Lastly, the project sponsored an informatization research competition in 2013, with a total of 387 finalists and 153 winners.

B. Operation of Distance Learning Training Center

Distance Training programs already include 42% of all teachers training programs. High satisfaction scores (87/100) and preference percentile (69%) from the attendees indicate increasing popularity of the e-Learning program.

1) Operational Status of the Distance Learning Training Program

Registration Approval for new distance learning training centers consistently increased until 2010, when it began to level off and eventually drops; in 2013 and 2014, there were no registrations at all. The cause for this phenomenon has been attributed to the strict standards for approval, rigid evaluations on educational contents and the successful customization and successful management of existing distance teacher training centers.

[Table 7] Status of Distance Teacher Training Centers: Openings and Closures

Classification	~2008	2009	2010	2011	2012	2013	2014
Opened	4	5	3	2	2	0	-
Closed	-	-	7	3	3	4	2
Total Number of Distance Learning Training Centers	68	73	69	45	44	40	38

※Since 2011, 23 city and provincial distance learning training centers have been under the supervision of the National Institute for Educational Research and Training

2) Operational Assessment of Distance Learning Training Centers

Distance learning training centers are assessed annually to improve quality control of training operation and customer service satisfaction. Assessment results are to be disclosed in some parsed information format to improve teacher expertise and act as fundamental data to enhance the operational quality and internal integrity of such training centers.

[Table 8] Distance Learning Training Center Operation Approval Status on Educational Content (as of October 2014)

Classification		2011	2012	2013	2014
No. of training centers		43	42	40	38
Qualification Rating	Excellent	26	29	6	5
	Average	-	-	23	22
Unqualified		17	13	11	11

※Since 2013 three evaluation grades have been utilized namely excellent, average and unqualified

3) Distance Learning Training Support Centers

The Distance Learning Training Support Center (Hereinafter DLT Support Center) was designed to facilitate and assist in the long-term management of distant learning training centers. The support center incorporated IT education experts various recommendations and input and reorganized the management system accordingly; it also developed copyright guidelines to avoid possible copyright infringements of the contents in use. Furthermore, the support center conducted an online survey of trainee and customer satisfaction to gauge the training program's effectiveness and trainees' satisfaction.

4) Distance Learning Training Centers Information Security and Protection

The DLT Support Center distributed guidelines and checklists to inspect and

further evaluate any web vulnerabilities of any distant learning training center; it also conducted field inspections at 37 private distant learning training centers to double check for possible security vulnerabilities on their online homepages.

3. Online Learning and its Assessment

Online learning is a form of over-the-air i.e. correspondence education and ought to be either in real or delayed time as a learning system provided by teachers in order to guarantee students' learning rights and subject selection rights, based on the precondition that face-to-face teaching or physical attendance for learning is all but impossible.

A. Online Learning System

MOE, KEDI and the regional offices of education drew up an online learning project to configure a sustainable system to support online learning according to different school needs. The project has been funded by a special MOE budget since the second half of 2012. [Table 9] displays the roles and responsibilities of the participating organizations and agencies related to the online learning project.

[Table 9] Participating Government Agencies Online Learning Project Roles & Responsibilities

Role-players	Roles & Responsibilities
Ministry of Education	Policy-making
	Service related laws, infrastructure, support administration & financing
City & Provincial Offices of Education	Design regional management plans & guidelines
	Administrative & financial support & management
	Evaluation & assessment
Korea Education Development Institute	Developing management plans & execution
	Contents support & development
	Cyber education system development & management
Local Schools	Course information & course registration
	Selection of teacher managers & guidance provision
	Evaluation & completion verification

Source: KEDI, '2014 Managing Council of Substantiating Online Learning Project Manual'

B. Direction and Content

1) Online Learning Council Structure and Management

The Online Learning Council is a collective, consultative body of the MOE, city and provincial offices of education and KEDI, which has been designated to manage and support online class systems. Notable achievements of the Online Learning Council include amongst others, an amendment of the 'Enforcement Decree of the

Elementary and Secondary Education Act' Article 48 (Class Management Methods, etc.), Section 4 on December 30, 2013, to clarify the legal basis for online class management; and distribution of online class manuals to accommodate the city and provincial offices of education, prescribing instructions to manage online classes.

2) Management of Online Learning in Secondary Schools

Primarily, online lessons that target middle school students are managed via cyber learning provided by the regional offices of education. KEDI's oversees and support the general run-through of online learning programs. The online lessons for high school students are in fact conducted by KEDI, which is responsible for the provision of educational contents and supervision system; KEDI is also responsible for student registration for online lessons, opening new lessons and facilitation of each lesson to each requesting school.

3) Online Learning Managers

Online learning managers are tasked to substantiate the quality of online learning, improve learning effectiveness and course completion rates. A total of 50 online learning managers were selected from a list of recommended teachers from regional offices of education; 10 to 15 students per class were assigned to a single online learning manager.

4) Online Learning System in Secondary Schools

The online learning system in secondary schools are based on the cyber learning system of broadcasting correspondence High School; however, a number of functions have been upgraded to better reflect the defining characteristics of the online learning project. The online learning system also has minimum system requirements to manage these programs for Middle School using the contents from broadcasting correspondence High Schools.

C. Outcomes and Performance

The major outcomes of the Online Learning Project are as follows: first, the online learning project clarified the legal basis to promote and conduct online learning, assigning regional superintendents some autonomous power in the policy-making process so as to better meet the specific needs of each region; second, online learning verified the necessity and sustainability of online learning; third, the inception of the online learning council allowed consistent information follow-through and feedback to facilitate the stable management of online learning. In addition, it is

noteworthy that cyber contents and systems from broadcasting correspondence High Schools were utilized to serve the online learning system in secondary schools, as its utilization prompted the possibility of an inter-school online learning system comprising both Middle and High Schools.

4. Development and Application of Digital Textbook

Digital textbooks may play part in complementing the conventional, paper-based textbook by adding various digital contents. Additional advantages are realized when integrated with a variety of digital teaching and learning materials to improve classroom education by supporting self-directed learning in an individually customized manner.

A. Development of a Test Digital Textbook from 2014~2015

Model digital textbooks were developed for testing purposes and demonstrations in 2013 and 2014; after a yearlong assessment, evaluation and revision, some of the textbooks have been distributed to carefully selected schools for field-testing.

[Table 10] Digital Textbook Development Status: 2013-2014 (as of October 2014)

Classification	Subject	Grades	Year Developed	No. of Books	Developers, Publishers & Appraisal Authorities
National Textbook	Social Science	Grades 3~4	2013 (Completed)	4	- Compiled by: Chinju National University of Education State-Published Book Compilation Committee - Developed by: WEDU Communications - Reviewed by: National Social Science Digital Textbook Compilation Committee
		Grade 5	2014 (In development)	4	
	Natural Science	Grades 3~4	2013 (Completed)	4	- Compiled by: Korea Foundation for the Advancement of Science & Creativity State-Published Book Compilation Committee - Developed by: DaouinCube, Sangrok Media - Reviewed by: National Science Digital Textbook Compilation Committee
		Grade 5	2014 (In development)	4	
Qualification	Social Science①	Grade 7 (Middle School)	2013 (Completed)	5	- Published by: Doosan Dong-A, Mirae-n, Chunjae education, Visang education, & Jihak textbooks - Reviewed by: Korea Institute of Curriculum & Evaluation
Approved	Natural Science①	Grade 7 (Middle School)	2013 (Completed)	8	- Published by: Kyohak Books, Doosan Dong-A, Mirae-n, Visang education, Sinsago Books, Jihak textbooks, Chunkae books, & Chunjae textbooks - Reviewed by: Seoul Metropolitan Office of Education

B. Digital Textbook Test Demonstration

1) Digital Textbook Model Schools in 2014

To proceed with digital textbook test trials and demonstrations, MOE selected 144 smart education-based digital textbook model schools in 2013 and 163 in 2014. Selected model schools from 2014 received digital textbooks developed in year 2013; additional study and learning environments were constructed to better utilize digital contents and media.

2) Digital Textbook Platform

The digital textbook platform service was developed as a cloud-based system since the service was initially entrusted to KERIS in 2012. The platform service comprises two parts namely: a viewer program with a textbook reader and other studying tools; and ‘Wedorang’, a communal study site that allows for the sharing of educational information and collaboration between students. Both the digital textbook viewer and digital textbook contents operate on Microsoft Windows, Google Android, and Apple iOS operating systems. ‘Wedorang’, a study community compatible with the digital textbook, was designed for students to offer feedback on the textbooks via study notes then upload and share their notes and other study data with one another.

3) Distribution of Teaching Materials to Improve Digital Textbook Usage

By collaborating with 14 governmental institutions directly associated with MOE and MCST, MOE secured 9,251 educational articles in 9 categories such as culture, arts, history and others. MOE restructured those articles into textbook-based learning contents. In August 2014, MOE provided those learning contents via the EDUNET service. Subsequently additional digitalized education contents were distributed via the EDUNET homepage e.g. a digital textbook leaflet (in Korean and English), digital textbook manual for Middle and High Schools (teacher and student versions were created separately), learning classroom management guidelines, smart education environment guidelines and a list of 100 popular and/or exciting smartphone applications.

4) Efficiency Evaluation and Dysfunction Response

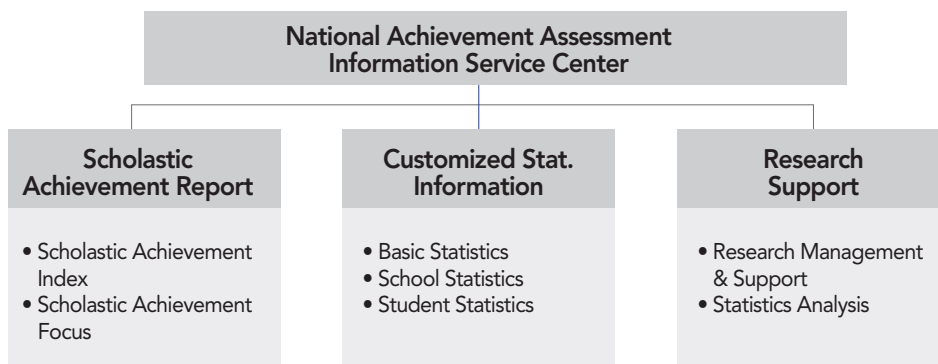
Efficiency evaluations of digital textbook usage in 2014 continue to be done prior to, throughout, and following examinations in 2014. Subsequent tests have created an important framework and element for efficient digital textbook composition. More tests will be conducted in April and November of 2014. Comprehensive research on the effects of Digital Textbooks will be conducted by a team from Gwangju National Education University starting in 2014 and is expected to continue

throughout 2016. During these 3 years, the research will examine a plethora of psychological and visible physical changes in students using these digital textbook programs; primary testing and test subject selection will occur in 2014.

5. National Achievement Assessment Information Service System

With the proclamation of ‘Government 3.0’ presenting a new paradigm in governance and increasing nationwide attention on national projects and their assessment arose with a need to provide citizens with information on governmental projects and evolutions. As a result, the Korea Institute of Curriculum and Evaluation (KICE) began to develop a national achievement assessment information service system, and the system’s main composition is laid out in [Figure 1.]

[Figure 1] National Achievement Assessment Information Service System



Source: KICE, National Achievement Assessment Information Service System Report, 2013

A. Achievement Assessment Report Service

The Achievement Assessment report service comprises of the student assessment of academic achievement, characteristics, interests, and related statistics and standardized data that reflect the aforementioned data. The service is provided online to every consumer of education.

The model academic assessment standards index reflects regional and gender data on achievement levels in Primary, Middle and High Schools. Regional school development data and indexes are also provided; all data can be provided in tables and graphs; also, all data can be downloaded. In 2014, additional data will be provided including achievement rate trends, locally scaled achievement ratio trends,

the regional improvement index of the city and provincial offices of education. A quarterly webzine(online magazine) is published, sharing contemporary and important data and trends.

B. Customized Statistic Information Service

Customized Statistic Information Service is a type of search engine that allows many to access information on achievements, authorized indexes and data of distinct features from Primary, Middle and High School.

Primary statistics are national information displaying characteristics on the level of academic achievements by student and school. In detail, national, regional, district-wide comparisons of achievement rating and index, qualification rates and measurements, improvement rates and other satisfaction ratings are available.

School Characteristics Statistics provide school principals feedback on academic achievement and academic achievement assessment results of their schools. It also provides correlation between the main variables and academic achievement for all students who participated in the survey conducted.

C. Research Support Service

Research Support Service is an online contest related to operating systems developed since 2010, prompting educational researchers to postulate standardized statistical analysis tools for use in various studies.

Since 2010, the service has been pushing for connivance in ongoing research. Academic achievement assessment and annual College Scholastic Ability Test data were provided, as well as to identify high value differentiation by academic research studies. As a result, educational and administrative research were evaluated and obtained excellent results. A symposium to discuss in-depth study and to spread these excellent results was held.

The Statistical Analysis Service has provided services to develop a sampling program in 2013 to support the researchers and data analysts.

Section 2. Support Services for Teaching and Learning

1. National Teaching and Learning Center Service, EDUNET

EDUNET(www.edunet.net) is a national teaching learning center service providing studying and learning information required for primary and secondary education. EDUNET collects all data from MOE, offices of education, and other

related organizations to develop and provide customized information to meet important user needs (teachers and students). In 2014, the digital textbook sharing and exchange service was added to recreate this service to be more based on school textbooks, creating 'a virtuous cycle of distribution and sharing network in education information' to fulfill its functional needs.

A. EDUNET Content Service Status

1) Content Development and Securing

Upon its service reorganization, EDUNET offers curriculum utilization contents and resources for each textbook. Using the contents from curriculum, students can access suitable learning resources that correspond to actual student textbook contents (Regular curriculum flows as follows: Basic learning ⇨ Exercise ⇨ Review ⇨ Examination).

2) Customized and Maximized UI · UX Provision and Search Engine

The reorganized EDUNET service also reclassified its service menu to suit user usage and interests. The menu system has been applied in a non-fixed Metro UI design form, allowing changes upon the user need. In addition to the existing EDUNET service, data reflect the actual data sought after is difficult to find in huge one evaluation. The newly added EDUNET Search drastically improves the application of the type and intended use of data and search filters, search and menu themes related to the main keyword searches, etc.

3) User Feedback Service

Users continue to comment and reflect on the EDUNET service being operated to construct a support group consisting of Elementary and Secondary Teachers and civilian experts made up of 13 people in 2014 to improve the service to reflect the latest trends. In addition, user satisfaction surveys have annually been conducted.

4) National Education Information Sharing System

The National Education Information sharing system is run through EDUNET and KEM(Korea Educational Metadata). In addition to restructuring the service revision in 2009 to modify course curriculum, it has been applied to the taxonomy of KEM, city and even educational services. Newly developed, it also introduces a menu when needed to improve the ease of searching for specific information services throughout the Department of Education and Registration Data.

5) Contents Quality Check

Sharing via EDUNET and analyses of domestic content management practices to enhance the quality of content distribution and sharing, including sharing type and detailed step-by-step instructions and content management standards, procedures and guidelines that were developed with Content Management donations. In addition, content registration and classification, quality assurance, an integrated content management system usage for statistical classifications for content management (CMS) to improve the collection, service delivery, management, etc. required more efficient operation.

6) Connection of Digital textbooks and Expansion

In 2014, elementary and junior high society, the spread of digital textbooks for science began. Digital textbooks can be downloaded via EDUNET with training that will help you take advantage of the digital textbook materials, instructional practices and support stable distribution and application of digital textbooks by allowing you to make and share a variety of information

B. Content and Service Usage Status

According to EDUNET Content Statistics, there has been an increase in visitors and users following EDUNET service renovations, before which, the numbers were gradually declining. Also, it is noteworthy that monthly statistics vary according to the school calendar, reflecting primary and secondary school schedules.

[Table 11] 2010~2014 Number of Visitors using EDUNET

(Unit : number)

Year	2010	2011	2012	2013	2014 (August)
Number of page views	35,497,848	826,258,727	343,651,034	288,547,035	248,253,784

The EDUNET online service, aims to prevent privacy intrusions, and does not disclose membership information since it is not utilized as per the Privacy Act (dormant members are classified as those who have failed to log in for three years); 5,923,930 profiles were erased.

[Table 12] EDUNET Membership Status

(Unit: persons)

Classification	Primary School	Middle School	High School	Teachers	Preliminary Teachers	Professionals	Parents	Others	Total
No. of Memberships	62,552	104,633	71,087	136,721	30,295	11,259	48,569	111,133	576,249

2. Cyber Learning

Cyber-learning started in 2004, allowing private education and training for the purpose of operation to bridge the digital information gap in 16 cities across the country; it is also a free online learning service that allows students to conduct self-learning via the Internet. In particular, in 2013, cyber learning underwent a change in name to become known as ‘Cyber Home Learning’. In 2014, the Cyber Learning Environment continues to increase as the demand for mobile services increases.

[Table 13] National Cyber Learning Status: 2005~2014 (July 2014)

(Unit: Persons)

Year	No. of Student Members	Placement Types		No. of Self-study Students	No. of Daily Log-ins
		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
Aug. 2011	4,166,719	67,356	1,071,836	738,450	228,150
Aug. 2012	4,477,108	48,108	696,934	281,832	135,346
July 2013	4,236,134	48,346	635,724	183,365	104,929
July 2014	2,633,078	36,161	470,183	133,690	73,836

※ Extracted from 2011 data that only includes self-study students

A. Service Status

In order to use the services of cyber-learning coursework, one must first select ‘placement type’, and whether or not to use any form of ‘self-study’ type. Upon selecting the placement type, placement type, cyber teachers become available and manage members of the Cyber Classroom. The cyber teacher is selected and learning

content provided. On the other hand if the self-study type you select was chosen from a variety of content provided by cyber-learning services to meet your needs, and you can learn autonomously at a pace that is set based on your own learning schedule.

B. Content Status

Cyber-learning content and development have ensured a step in the right direction help improve student grades following the trial. Training sources reflecting the characteristics of each level have been in place since 2007. This further supports self-directed learning through supplementary content, detailed-oriented content and organizational-content developed in 2013. The MOE and content developers must apply the 2009 revised curriculum in conjunction with the Korea Institute of Curriculum and Evaluation following consultation with the Department of Education.

C. Service Diversification

Cyber learning and content services have provided a variety of services to support various subjects. In particular, Cyber learning has mitigated the difficulties associated with the lack of face-to-face contact, by making video consultations available to learners encapsulated in the remote lecture system.

To further improve learner academic achievement, a Learning Management System (LMS) was designed and built to focus on specific learning diagnoses and prescription based on user habits and/or proclivities.

The Content Delivery System (CDS), a content management distribution system, was put into operation in 2011 and started pushing for the establishment and use of activation measures from 2014 onwards. Such measures would involve diversification for example mobile services. Furthermore, future preparation for cyber learning include the Learning Management Plan on mobile environments to establish both long-term development plans and information strategies with Information Strategic Planning (ISP).

3. Creative Experimental Activities Support System, EDUPOT

A. Project Overview

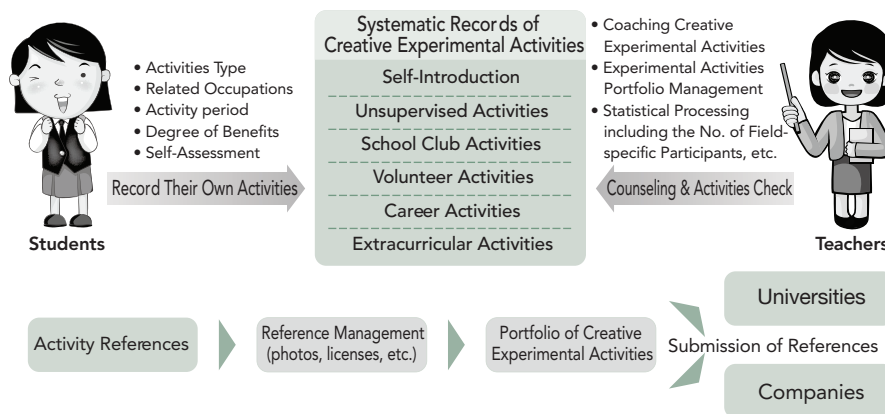
With creative experimental activities that consolidate existing extra-curricular activities, and creative discretionary activities introduced as part of the 2009 Revised National Curriculum, came the requirement to strengthen creative personal

education and career education. This aimed to ensure students enhance their skills autonomously, set up, seek out, and develop personal careers by instilling good planning practices early in their school years. Further, with the admission officer system having been newly instituted and extended, the requirement to procure reliable references with regard to the status of a student's creative experimental activities also developed.

The project to build such a general system for creative experimental activities (EDUPOT) thus commenced to meet these needs and commenced services on August 26, 2013.

EDUPOT is an online system that documents and controls the various creative activities a student engages in for the duration of their school years. It may be better described as a pot containing the procedures the students have experienced and their performance in relation to activities focusing on four areas set forth in the curriculum regarding creative experimental activities. They include accounting for unsupervised activities, school club activities, volunteer activities, career activities, and extracurricular activities such as writing an introduction letter and describing in detail the after-school activities they have diligently participated in.

[Figure 2] Main Service Flow of EDUPOT



B. Project Status

EDUPOT's active status began in earnest with the 2010 physical Edu-based podcast initiated by the Busan Metropolitan City Office of Education (both hardware and software), incorporating sophisticated features, Edu Podcast Information strategy planning, organizational and operational Counseling Center, and Edu Podcast National Service Operations with promotion and training support.

EDUPOT teachers, parents and junior students may use the system upon verification and approval of the aforementioned student centered creative experience activities. Parents are able to review their child's writing history through NEIS. In addition, student self-introductions, other voluntary activities, extracurricular activities, volunteer work, course work that includes activity recording, and after-school activities are managed.

C. Main Outcomes

In 2013, the government connected and enhanced integration of the EDUPOT and NEIS services to minimize operational errors in software development and application. For this, development and verification systems were designed during pre-inspection. In addition, service Q&A center personnel was doubled to more effectively handle any user inquiries. Other inputs and additions were made to improve the maintenance system for effective application and software management.

In 2014 EDUPOT's administration was enhanced. EDUPOT operations focused on realizing the dreams of students with the concept of 'Happy Education'. Centering on school teachers leading a free semester system, the number of EDUPOT managers were effectively increased from 47 people to 66. Numerous programs were used in teaching operations, increasing the participation and understanding of teachers. In an effort to cultivate student creativity and reasoning skills, the EDUPOT Portfolio Competition came to be.

[Table 14] 2013 EDUPOT Membership Status

Classification	Membership Status	
	Number of Students	Percentage (%)
Middle School	1,299,914	72%
High School	1,764,762	93.2%
Total	3,064,676	82.8%

※Middle School totaling 1,804,189; High School totaling 1,893,303(2013 Data)

4. Comprehensive Support System for Reading Education

A. Project Overview

The Comprehensive Support System for Reading Education is standardized and will be put into practice on a regional scale (in every city and provincial office of education). Support for the existing school library services and management of post-reading activities are incorporated into this service.

The reading education system provides comprehensive sustenance to key business support services in school libraries (listings, loan returns, bank book reading etc.). It offers automated, Internet-based reading support, available quantities (information retrieval, reading informational expressive activities, reading guidance and counseling, etc.) and a comprehensive search, content, and link lists of external agencies.

B. 2014 Projects

1) Reading Education Service Center Homepage

The MOE is planning to develop a homepage for a reading education service center to improve information accessibility to reading education contents that can be located throughout various public organization web sites (such as regional offices of education home pages etc.) and allow quick and comprehensive searches by students, teachers and parents. By linking it with EDUNET, the reading education service center shall uniformly present the various e-contents scattered over different sites.

2) Reading Education Service Center Advancement

The MOE is currently working on further development of a statistical system to enhance the aforementioned reading education service support system. The development will proceed in compliance to related laws e.g. Disability Discrimination Act, Human Rights Act, and others. Furthermore, DLS web accessibility will also be altered towards more of a PC-environment customized service. The following projects are being pursued: gaining web accessibility in reading education service centers via qualifying web-standard marks; developing a cyber-reading environment (utilizing cyber reading competitions) and developing school library homepage templates.

3) Infrastructure of Regional Offices of Education

To improve the efficiency of the reading education support system, an operating guidelines are provided. The guidelines analyzes the infrastructure of the 17 city and provincial offices of education to derive and recommend best practices and ensure the best possible security for infrastructure hardware and software. Also, Database (DB) performance and security checks by DB experts ensure increased data protection; DB's operating and managing guidelines are provided supplementary.

C. Project Outcomes

1) Reading Education Service Center Status (2003 to March 2014)

In 2014, DLS-registered Elementary, Middle and High Schools numbered

11,617 indicating a 0.2% increase based on 11,592 registered schools for the year in question. Conversely, the number of registered students decreased from 8,851,384 (2013) to 7,023,650 (2014), indicating a significant decrease of 20.6%. The decrease in the number of registered students has been positively linked to the amendments related to increased personal information security, which eliminated all inactive accounts (dormant for 3 years), and the automatic expiration of student accounts upon graduation.

2) Reading Education Service Center Extracurricular Statistics (2013.3.1~2014.2.28)

As for extracurricular reading activities within the reading education service support system, Elementary School students participated in 5,386,827 reading activities whereas Middle School students participated in 2,790,311 instances and High School students accounted for 2,452,938 instances. On average, any given student participated, on average 1.69 times, in extracurricular reading activities.

5. EBS CSAT Class Internet Service

A. Project Overview

EBS CSAT lectures, started in 1990, are one of EBS's flagship educational services. As part of an MOE announcement made in February 2004, private education mitigation is gauged through public education normalization with 'the linkage of EBS lectures and assignment of enhanced SAT examinations. In June 2007, the MOE and EBS entered into a cooperative agreement, and subsequently signed the tripartite MOE-EBS-Korea Institute of Curriculum and Evaluation' agreement in March.

In February 2011, other reductions in the reliance on private education were linked to the aforementioned collaboration agreements and materials along with SAT-EBS linked policies supplementing public education', river level up, attempts to systematize and enhance expertise in materials development, and so forth. In June 2014, a personal academic standards system was developed for students for use in conjunction with EBS diagnostic coaching to help students better identify and focus on their respective aptitudes related to learning and careers (EDT, also known as the EBS Diagnostic Evaluation & Treatment System) service was undergoing pilot testing.

[Table 15] 2011~2014 EBS CSAT classes

Categories	2011		2012		2013		2014	
	Lectures	Views	Lectures	Views	Lecture	Views	Lecture	Views
CSAT	752	17,896	798	15,235	826	15,726	684	9,709
GPA	377	6,935	607	7,449	145	4,274	86	2,836
Writing	96	2,255	88	1,083	52	1,847	47	1,967
Subtotal	1,225	27,086	1,493	23,767	1,023	21,847	817	14,512

B. 2014 Main Projects

1) EBS CSAT (College Standard Admission Test) Textbooks

A cooperation venture between CSAT test makers KICE (Korea Institute of Curriculum and Evaluation) and CSAT-related reviewers and test book publishers including EBS, Education Broadcasting Service, was reinforced so as to minimize errors and increase the quality of CSAT test review books mainly due to 70% of CSAT questions derived from CSAT reviews and other test books as mandated by existing EBS CSAT policies. To ensure book quality and reliability, the ‘camp review’ was added on top of ‘home review’ and ‘online reviews’. The KICE review process also tested and approved test books quality and accuracy.

2) EBS CSAT Lectures Enhanced

EBS CSAT lectures were comprised in excess of 21,000 TV lectures in 2013 to ensure students take the 2014 CSAT (Test types A & B in Korean, Mathematics and English subjects) and thereby effectively reducing private expenditure on additional CSAT tutorials and education. In 2014, more than 14,000 lectures were produced in aid of student preparation for the 2015 CSAT to avoid the need for additional and costly private education.

3) Numerous Services provided via EBSi

2014 saw EBSi celebrate its tenth anniversary. EBSi provides quality education and admission information to its 4.3 million members. To prevent any theft or loss of personal information from the member database, EBSi successfully attained ISMS/PIMS standard certification from the Korea Internet & Security Agency (KISA). EBS is the first television broadcaster in Korea to have attained KISA standard certification.

4) Contributions to Society

To resolve education inequality and support the realization of disadvantaged

students' pursuit of their dreams, in spite of a plethora of difficulties they constantly encounter, the 'EBS Dream Scholarship' program selects dream scholars and provide them with financial support. Also, braille textbooks for visually impaired individuals, Audio On Demand (AOD) support for Korean textbooks, college orientations and introductions presented in disadvantaged areas, EBS clip-banks and other numerous projects have been develop to positively contribute and give back to society.

C. Project Outcomes

According to a service satisfaction survey conducted by EBS Research & Research (R&R), student-usage-rate of EBS CSAT lectures stood at 91.7% in stark contrast to the teacher-usage-rate of 99.7%, representing a 7.7% difference when compared to students. Furthermore, students used EBS lectures mainly via video clips and textbooks (56.3%) whereas the majority of teachers limited their use to textbooks (84.6%).

According to a research carried out by KEDI, EBS CSAT lecture services have reduced private education expenditure by approximately KRW 950 billion. Also, the economic value in fostering and enhancing education equality for those students unable to afford private tutors and education to take the CSAT has been estimated at KRW 820 billion.

6. Air and Correspondence Middle and High Schools

A. Project Overview

Air and Correspondence High Schools (ACH) had been conceived to fulfill and compensate for the educational hunger and sharing inequalities related to education privileges and personal development. ACH was first established in 1974 to allow 3.85 million people without High School diplomas to further their educational pursuits. By the end of 2014 a total of 42 ACH schools had been established. Following this, Air and Correspondence Middle Schools (ACM) was then initiated and developed. Starting with the initial ACM branches in the cities of Gwangju and Daegu, the current total stands at 6 throughout Korea.

B. Progress and Achievements

The ACH and ACM projects can be categorized into six main areas, namely: ①ACM Support System Development and ACH and ACM Creation ②Teenager Student Support ③Extracurricular Learning Evaluation System Development and Management ④Enhance Teaching Performance ⑤Cyber Education Content

Development ⑥ Cyber Education System Health Management and Advancement. Based on these goals and system contents, ACH and ACM have achieved the following results.

Firstly, the MOE, regional offices of education and KEDI collaborated to develop the 'ACM Executive Committee' to establish policies and effect adjustments to support increased construction of ACM and ACH. Secondly, career and personality exams have been offered to teen students with encouragement to continue their studies and helped to overcome their academic challenges.

Thirdly, extracurricular activities were taken into context and some accredited as actual classes through the 'Experience Accreditation' program. Even though one may not follow the normal outset of school curricula, the importance of studying and learning experiences was emphasized and introduced to all other schools.

Fourthly, in improving teachers' teaching performance, ACH teachers were afforded camp training and distance cyber training courses.

Fifthly, following the cyber education content development annual plan, 11 classes were developed for second-year middle schools; 11 classes for the third-year group are to be developed in 2014.

Lastly, to create a safer and more secure cyber education system, external LMS curriculum opening and management has been made possible. Furthermore, LCMS's content classification utility was enhanced to increase efficiency and management production values. The 'Experience Accreditation' system, online evaluation and additional online search functions were also incorporated.

C. Main Outcomes

ACM and ACH management has accomplished four key results in different categories. In 2013, two additional ACMs were established; and in 2014, 4 more followed to offer more opportunities to 3.85 million people yet to successfully complete middle school education requirements. The 'Experience Accreditation' program has created a new channel of evaluation and student grading method for academic achievement. Additional cyber education contents will be developed, including content for 7 specialized areas to better explore students' career options and guidance. Lastly, the ACM and ACH cyber education systems - cyber educational technology infrastructure - were strengthened to create a more stable study and learning environment and subsequently upgraded to accommodate mobile access and other important service expansions.

Section 3. Quality Certification and Standardization

1. National e-Learning Quality Control Center

A. Project Overview

The National e-learning Quality Control Standardization System ensures superior content quality, considered by most to be the heart of educational learning, assist in ensuring consumer satisfaction and drive providers to develop better educational contents. The system also contributes to product quality consultation as well as workforce training in the quality control and standardization fields.

B. Main Projects

1) e-Learning Contents Quality Certification

Since 1998, the educational contents industry has had a panel of judges for certification to encourage growth in the content industry by tasking them with the discovery of excellent educational contents made by private companies. The certification panel seeks to nurture the e-learning content industry as well as ensure that customer expectations related to learning standards are met.

[Table 16] Contents Quality Qualification Status: 1998~2014 (July 2014)

Year	Applied Contents				Approved Contents				Approval Rates(%)			
	Educational	Distance Learning Center	Distance University	Total	Educational	Distance Learning Center	Distance University	Total	Educational	Distance Learning Center	Distance University	Total
1998	227	-	-	227	130	-	-	130	57.3%	-	-	57.3%
1999	154	-	-	154	87	-	-	87	56.5%	-	-	56.5%
2000	179	-	-	179	138	-	-	138	77.1%	-	-	77.1%
2001	203	-	-	203	118	-	-	118	58.1%	-	-	58.1%
2002	102	-	-	102	87	-	-	87	85.3%	-	-	85.3%
2003	50	13	15	78	45	11	15	71	90.0%	84.6%	100%	91.0%
2004	45	76	10	131	42	68	10	120	93.3%	89.5%	100%	91.6%
2005	69	88	10	167	67	73	10	150	97.1%	83.0%	100%	89.8%
2006	27	172	10	209	27	135	10	172	100.0%	78.5%	100%	82.3%
2007	91	82	14	187	57	59	11	127	62.6%	72.0%	78.6%	67.9%
2008	137	283	8	428	96	197	7	300	70.1%	69.6%	87.5%	70.1%
2009	160	276	41	477	123	232	25	380	76.9%	84.1%	61.0%	79.7%
2010	192	340	35	567	124	232	27	383	64.6%	68.2%	77.1%	67.5%
2011	147	233	10	390	137	168	6	311	93.2%	72.1%	60.0%	79.7%
2012	110	280	19	409	80	231	15	326	72.7%	82.5%	78.9%	79.7%
2013	87	362	8	457	61	282	6	349	70.1%	77.9%	75.0%	76.4%
2014	73	320	1	394	47	199	1	247	64.4%	62.2%	100%	62.7%
Total	2,053	2,525	181	4,759	1,466	1,887	143	3,496	71.4%	74.7%	79.0%	73.5%

2) e-Learning Quality Management Personnel Training

To ensure excellence in e-learning quality management, an expert personnel training system was created and initiated in 2008; expertly trained personnel will manage every aspect of e-learning ranging from introduction, design, development, management, and evaluation.

3) e-Learning Quality Coordinator Qualification Program

In order to systematically establish infrastructure fostering an excellent e-learning workforce, an e-learning quality coordinator qualification program has been initiated to ensure the endowment of standardization and evaluation in e-learning projects.

[Table 17] Quality Coordinator Qualification Subject

Test Categories		Qualification Subject	No. of Questions	Type of Questions	Test Duration
1st	Written Test	e-learning basic and service plans	20	Multiple Choice	120 minutes
		e-learning content development	20		
		e-Learning infrastructure development & management	20		
		e-Learning service management & evaluation	20		
2nd	Practical Test	e-Learning quality check & management - e-Learning basics & service plans - e-Learning content development - e-Learning infrastructure development & management - e-Learning service management & evaluation	4	Short Answer	120 minutes

4) e-Learning Business Excellence Contest

The MOE sponsors and hosts an e-Learning business excellence contest to secure the e-learning industry's competitiveness, balance and promote the highest quality of e-learning production.

2. Education Information Standardization

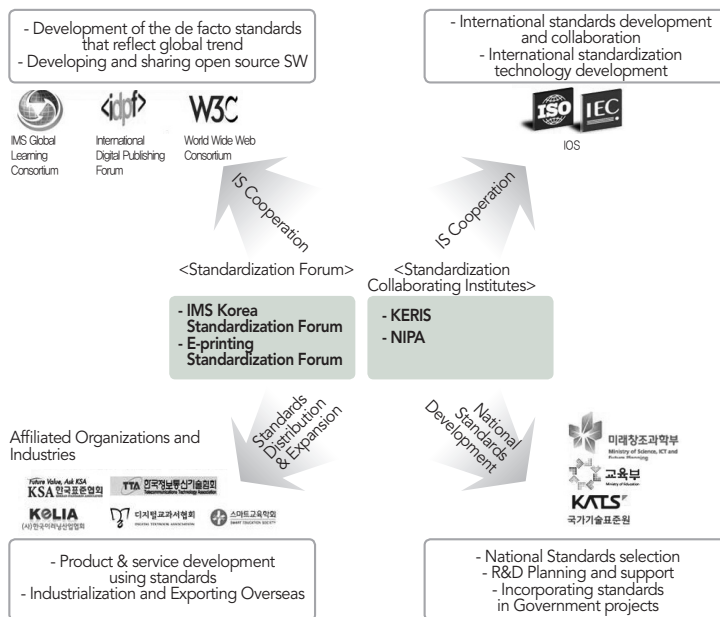
A. Overview

In light of recent technological advancements and the ensuing chaos and confusion associated therewith, there arose a need to create a set of standards to minimize technological and economic inefficiencies. Standardization projects encompass processes creating mutually beneficial or fair contracts and standards for all; standardization development follows numerous discussions and debates between stakeholders through various channels with multiple perspectives.

B. Standardization System

Standardization can be categorized as either de jure or de facto. Official i.e. de jure standards refer to those officially announced and approved by the government. Conversely, de facto standards are those mutually agreed to by the private sector and is generally considered accepted standards. De jure and de facto standards can be separated using criteria based on but not limited to location and classification.

[Figure 3] Education Information and Digital Publication Standardization Strategies



1) De Facto Standardization

De facto standards used in education are readily found in three organizations. IMS Global Learning Consortium (IMS Global) specializing in education technologies; International Digital Publishing Forum (IDPF) specializing in digital publishing; and the World Wide Web Consortium (W3C) specializing in general web related standards and other contents.

2) Public Standardizations

Public Standards are the standards officially posted by governments. In Korea, ‘KS’ is recognized as the national standard whereas ‘ISO’ represents international standards. Amongst the International Organization for Standardization (IOS) branches, the education sector directly associates with the ‘ISO/IEC JTC1 SC36 (Information Technology for Learning, Education and Training)’ Committee. Under JTC1, there exists a subcommittee called ‘SC34’ that deals with subcommittees. SC34 has since 2013 been in charge of electronic printing press and is a public standardization committee.

Chapter 2

ICT in Educational Administration and Finance

Section 1. National Education Information System, NEIS

1. Background

The National Education Information System (NEIS) is the information system developed in 2001 to aid the MOE, 17 regional offices of education and over 10,000 primary and secondary schools to better facilitate education administration. In 2001, NEIS was selected as one of eleven major projects for the government's digital master plan to collect diverse data and administration by NEIS that will prove valuable to education for teachers, parents and students.

[Table 18] History of the NEIS Program

Period	Main Outcomes
Sept. 2000~ March 2001	Nation-wide NEIS development: Business Plan Revision & Information Strategic Plan (BPR & ISP) developed ※Selected as one of 11 major digital plans (May 17, 2001)
Oct. 2001~ Nov. 2002	HR, Payments, Accounting, Resources etc. 27 work categories developed & infrastructure put in place & general management developed (November 22, 2002)
March 2003	Learning and Teaching. 5 additional work categories added
May 2003	NEIS in violation of Human Rights (National Human Rights Commission Report)
March 2004~ March 2006	Learning and Teaching categorized into 3 expanded areas (Education Informatization Committee)
March 2006~ Dec. 2008	Nationwide citizen service initiated ※Document Service (March 2006), Parent Service(Sept. 2006), and School Notification Service (Dec. 2008)
July 2009~ Jan. 2010	Next-gen NEIS Information Strategic Planning (ISP)
2011	Next-gen stabilized NEIS & further development of NEIS & field application
2012	Institute for the gifted& international schools also provided access to NEIS services
2013	Online school surveys, student psychological analyses, behavioral characteristics surveys. Cooperation with Ministry of Health & Welfare to build support systems for academically disadvantaged groups
2014	Government 3.0 NEIS information publication Graduate school records digitalization; Informatization Strategic Plans developed; NEIS nationwide revision Student bodies response functionalities improved; career options offered; provision of online resources for qualified individuals sitting exams; NEIS selected as primary technological information infrastructure

2. 2014 Main Projects

A. Policy Implementation

First of all, the NEIS system enhanced support capabilities to strengthen national education policies; higher education career options and information via the NEIS entrance system was developed; customized services were additionally created to better serve hopeful GED students seeking university entrance; web accessibility in special education and general education were improved and expanded; specialized and personalized education options were created in the studying and learning sector of regular schools. Moreover, suggestions were made to save and manage NEIS graduate students' school records even upon graduation; also, online survey programs aimed at students and parents have been developed. NEIS reflected the Asbestos Safety Protection Act, which made the asbestos management map mandatory, and for construction asbestos management accounts and other documents to be secured and made available for oversight at any time. Ergo, NEIS seeks to save data in all its entirety.

B. Nationwide Service Expansion

In light of Government 3.0, MOE made the NEIS program public and accessible in terms of information for private sectors to utilize completely. NEIS public information services will be modified for an enhanced user experience and environment. Student and parent services will be revised and drastically expanded. Many inter-system links and connections were created within the NEIS system framework. For example, NEIS shares the 'Saeol' system which links private academies and study rooms with the Fire Department and creates an information link to the local tax information system (MOGAHA). The Ministry of Welfare also incorporated an education expense support program named the 'Happiness e-connect System' to support disadvantaged students.

C. Work Optimization and Improvement

The application of NEIS in each working category and various application methods were analyzed to help with design, optimization and improvement. Following that, the regional and local offices of education offered input to create an additional development list. The NEIS field council was formed based on different city and provincial offices of education board member needs or conditioning. In each of the regional offices of education, there exists a regional call center for the NEIS service as well as a central headquarters to systematically support and manage the general and comprehensive online user cumulative support system. Furthermore, to increase the managerial awareness of NEIS use and utilization, a corresponding

training program was added and a suitable managerial course was further expanded to incorporate the necessary curriculum and education to better facilitate NEIS.

D. Providing Infrastructure to Stabilize the System

Upon the selection of primary and important informatization communication institutes, NEIS conducted security checks and reviewed safety plans for system protection. In 2014, the Information Communication Security Master Plan was established to reinforce the overall system management structure. Education administration, finance, and data backups were developed and deployed to prevent any possible data losses and to sustain data continuity. In addition, administrative and structure management standardization and common infrastructure were further enhanced. Server, network, package software, and printed guidelines to effectively run the NEIS system with a Frequently Asked Questions section (FAQ) were designed and subsequently distributed. At the time of writing, NEIS, EDUFINE, and other administrative systems have undergone convergence to be managed under one umbrella system.

Section 2. Local Educational Administration and Finance System, EDUFINE

1. Project Overview

In February 2005, the MOE convened the Digital Regional Education Finance Team to develop a local education administration and finance system now known as EDUFINE. EDUFINE's main objective was to reflect on and incorporate user feedback, reduce redundant work, provide transparency in regional education's finances, and improve the efficiency and safety of the online administration and finance system.

From 2005 to 2013, a total of KRW 124.6 billion was invested in the development of EDUFINE. Software development and upgrades cost KRW 25.1 billion, infrastructure development cost KRW 64.5 billion and management and repair costs totaled KRW 35 billion. Software development was funded using the Digital Government Fund and other special fund allocations. Management and repair costs were covered by government subsidies between 2009 and 2011 and are now being funded with special grants made available from 2012 onwards.

2. 2014 Projects

To obtain viable EDUFINE user feedback, a council comprised of principals,

vice-principals and other administrative staff was established to do so. EDUFINE staff and research teams visited various schools to consider and obtain direct school field feedback. Also, satisfaction surveys are conducted, targeting school users.

In 2010, to improve accounting and finance transparency, a new digital finance exchange service has consistently been expanded for data on 10,930,352 transactions (est. value of KRW 4.904 billion), representing a 73% increase from 6,292,304 transactions in 2012 (KRW 2.187 trillion). In June 2014, transactions valued at KRW 6,960,010,000 (KRW 6.960 trillion) were completed.

To support 550,000 EDUFINE users the central integrated calling center has been in operation since 2012. In 2014 alone, there was an estimated 63 professional counselors working fulltime from 9 am to 6 pm every day to answer whatever questions EDUFINE users may have regarding the program.

Agencies tasked with assisting the operations of EDUFINE are basically the 241 transportation centers, and the 3,081 regional offices of education, totaling 3,322 bodies. To ensure smooth operation, 17 regional bodies and KERIS are collaborating in the upkeep and protection of the systematic structure and program.

[Table 19] EDUFINE Operation Chart

Classification	Main Roles	Main Functions
General Administration by the Ministry of Education	Overview Design & Revision	<ul style="list-style-type: none"> • System Guidelines Design & Revision • System Master Plan & Budgeting • Standardization Issues, Legal & Systematic Preparation • Inter-agency Cooperation & Advertisement • Additional Policies to Facilitate Project
EduFine Center (KERIS)	System Management H/W & S/W repairs, & Counseling	<ul style="list-style-type: none"> • Policy-making Support & Decision-making & Management • S/W Repairs & Advancement • Working Partnerships (KDI & Administration Information Center) • Hardware Repairs & Upgrades • Central Call Center & Personnel Training
Regional Offices of Education	User friendliness, & business dealings	<ul style="list-style-type: none"> • Individual Project Management • MOE H/W Infrastructure Initiation • Establish Working Council • User Education & Work Support

3. Main Outcomes

A. Project Outcomes

One major accomplishment achieved by EDUFINE was the creation of a one-stop system, which allows for budgeting, execution and finalization to be performed all in one. As such, budget and accounting workloads have drastically been reduced for regional offices of education and other pertinent local education institutions.

Also, the transparency of budgeting and accounting have vastly been improved, and EDUFINE's one-stop business transaction capabilities prevent possible corruption and/or backhand dealings.

B. Customer Satisfaction

According to a user satisfaction survey pertaining to the EDUFINE system, satisfaction ratings are on the rise, up from 70.8% in March 2012, to 74.2% in September 2012, and finally 75.9% in October 2013. Also, a user satisfaction survey on the central call center indicated improved ratings. The call center's special accounting sector for education tax scored 95.4 points, a sharp increase from 88.6 points in 2013. The school budget accounting sector scored 95.4 points, increasing from 89.1 points in 2013.

Section 3. Education Information Notification System

1. E-childschoolinfo: Kindergarten Information Notification System

A. Project Overview

Governmental expenses increased due to preschool children education expense support attributable to programs such as 'Nuri-curriculum implementation' (kindergarten). At present, national attention is firmly focused on the kindergarten education sector. As a result, popular societal demand for access to information about preschools and kindergartens skyrocketed. In response to this demand for accurate and timely information, 'E-childschoolinfo', the kindergarten information notification system (hereinafter referred to as E-childinfo) came to be. The E-childinfo system provides parents and stakeholders with comprehensive information on the overall composition and environment of domestic Korean kindergartens. With the provision of current status information regarding the education system using public notifications, the MOE and government agencies anticipate enhanced transparency in preschools and kindergartens. They furthermore expect to secure the public's right to know and allow parents their preferential rights to carefully consider and choose.

B. Main Outcomes

1) E-childschoolinfo Domain (e-childschoolinfo.mest.go.kr)

For nationwide service coverage of e-childinfo to be effective, notification and publicity of the domain and the web site was done prior to actual creation and initiation. The main menu of the web site contains an introduction to the

e-childinfo service, kindergarten information and a notification forum. Under the heading of kindergarten information, there are subcategories to navigate and review kindergartens by name and/or area, a search function to find specific disclosures and other important directories and indicators.

2) Customer Support Center

The Customer Support Center was opened on 21 August 2012, just a few weeks preceding the notification of the e-childinfo service. The customer service phone number is '1544-0079'. The last four digits, 0079, is wordplay that translates into Korean vernacular as 'public companion' or 'eternal friend'.

3) Domain Names and Addresses of Regional Offices of Education

The Domain names and addresses of regional offices of education are set as follows:

[Table 20] Domain Names and Web Addresses of Regional Offices of Education

City & Provincial Offices of Education	Domain Address	City & Provincial Offices of Education	Domain Address
Seoul	e-csinfo.sen.go.kr	Gyeonggi	e-csinfo.goe.go.kr
Busan	e-csinfo.pen.go.kr	Gangwon	e-csinfo.gwe.go.kr
Daegu	e-csinfo.dge.go.kr	Chungbuk	e-csinfo.cbe.go.kr
Incheon	e-csinfo.ice.go.kr	Chungnam	e-csinfo.cne.go.kr
Gwangju	e-csinfo.gen.go.kr	Jeonbuk	e-csinfo.jbe.go.kr
Daejeon	e-csinfo.dje.go.kr	Jeolla	e-csinfo.jne.go.kr
Ulsan	e-csinfo.use.go.kr	Gyeongbuk	e-csinfo.gbe.kr
Sejong	e-csinfo.sje.go.kr	Gyeongnam	e-csinfo.gne.go.kr
		Jeju	e-csinfo.jje.go.kr

4) E-childschoolinfo Site Status

[Table 21] below statistically indicates visitor/user numbers for the E-childschoolinfo site.

[Table 21] Monthly Visitors to E-childschoolinfo

(Unit : Persons)

Period	2013						2014							
	7	8	9	10	11	12	1	2	3	4	5	6	7	8
Visitors	16,649	18,428	36,199	82,865	128,021	84,742	105,856	511,415	591,629	337,259	275,054	316,688	473,201	414,045

2. School Information Notification Service (School-Alami System)

The School Information Notification Service readily and publically announces pertinent and related school and other educational institution information so as to

ensure all citizens' right to be informed, encourage public participation in education, increase administration and management education transparency and to promote data-based policy-making as well as enhance academic research.

A. Project Overview

In November 2008, the 'Enforcement of the Special Act on Information Disclosure of Educational Organizations' was announced to establish the legal foundation required for the school information notification system. KERIS was designated as the consigned agency for the School Information Notification Service (hereinafter referred to as 'School-Alami'). 'School-Alami' was developed in September 2008 and first commenced nationwide information notification services in December of that same year.

B. Main Outcomes

1) Notification Subject

Special Act Clause 5 states that 'The head of primary and middle school schools must annually disclose via public notification, information regarding school administration, curriculum, management and school constitutions, etc. The school information notification service's subject and/or main agent is tasked by law with its responsibilities and caretaking, and in this case the head or principal of primary and secondary schools in Korea. Clause 5 of the Act, additionally states that regional school superintendents' and the secretary of the Ministry of Education may, with discretion, also release information pursuant to the specific condition that disclosed data would positively serve their academic research foundation of the national agenda.

2) Notification Content

The Special Act on educational information disclosure states the 15 categories of information that primary and middle schools are obliged to disclose and inform the public about. The details of categories are listed in Figure.

3) Notification Agency

The roles and responsibilities of the School Information Notification Agency has been consigned to MOE, monitoring agencies, regional offices of education, the KERIS management team and individual schools.

[Table 22] School Information Notification Operation

Agency or Organization	Main Roles & Responsibilities
Ministry of Education (Education Statistics Team)	<ul style="list-style-type: none"> · School notification policies · Meeting the requests of the disclosure participants · Standardization of notification forms & manuals
Information Notification Business	<ul style="list-style-type: none"> · Counseling & Advice regarding the notification process · Analyses & Research of notification process
Management Team (KERIS Management Statistics Team)	<ul style="list-style-type: none"> · Develop school notification system · Collect & secure, monitor & evaluate disclosures · Administer user support & call center · Notification development · Process applications for disclosures
KEDI	<ul style="list-style-type: none"> · Provide informative statistics & resources · Verifying resources' authenticity
Regional Offices of Education	<ul style="list-style-type: none"> · District school support · Collecting & evaluating school information · Quality checks & field evaluations
Local Schools	<ul style="list-style-type: none"> · Detailed Operation of information notification · Printing & posting or mailing the notification · Keep initial sources of disclosed information documents

3. School Information Notification Service (University-Alami System)

The university information notification system, 'University-Alami' (www.academyinfo.go.kr), provides consumers such as students, parents, businesses, governments and more with information on the current educational environment, performance and other relevant university data. This information is widely utilized during the selection of which university and/or faculty to join, recruiting, advanced education policies etc. Universities' information are collected by the Korean Council for University Education. After categorical data is collected and properly categorized, it is then distributed or made available to the public through 'University-Alami'.

A. 2014 Project Overview

In 2014, the university information notification system (University-Alami) ran various projects including project management operations, notification areas and application expansion and the customization and reinforcement of information services. Also, notification quality and reliability underwent actual in-field evaluation and re-examination to identify areas for adjustments and improvements. Moreover, an advertisement UCC was created to advertise the university information notification system while the Open API system was in development

Another series of field evaluations were organized to identify and correct erroneous notifications and disclosures. The list of evaluated schools increased annually from 50 in 2012 to 120 universities in 2014.

As the administrative and procedural importance of the university information notification service became more prominent, an issue paper dealing with the notification service was published to provide more thorough and multi-layered analyses to its readers. The issue paper was published quarterly and distributed, corresponding with the public disclosure dates for April, June, August, and October.

B. 2014 Main Outcomes

1) Information Notification and Management

In order to optimize management and managerial efficiency, amendments to the ‘Enforcement of the Special Act on Information Disclosure of Educational Organizations’ were made. To better facilitate notification services, overall and sectional managing committees met on a monthly basis. Through various data categorizations, overall information linking efficiency was hence improved. Standardization of the categorizing system and compilation of an instruction manual allowed for the systematic administration and management of information collection and relevant statistics.

2) Customized Information Notification

To increase accessibility to information search capacity, ‘University-Alami’s’ comprehensive and comparative search function was enhanced. Also, disclosure areas were expanded to better represent different universities’ information. In order to ensure accuracy of public notifications, editing and evaluation procedures underwent expansion to improve printed information reliability.

3) Expanded Notification Contents

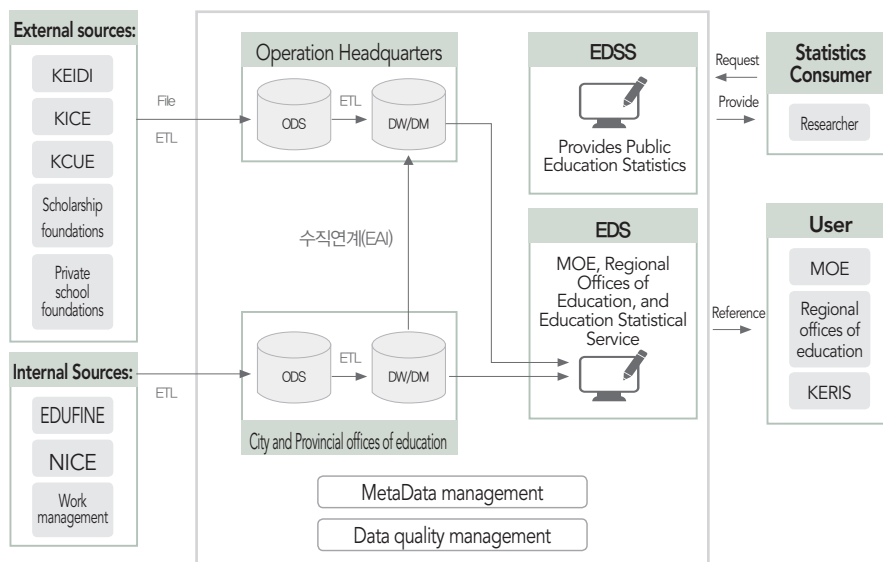
Critical and imperative university information are accessible via Open API, allowing citizens to use and share the disclosed information at liberty. Also, the Open API is used in conjunction with University Admission Site(univ.kcue.or.kr) to better inform parents and prospective students about universities relevant to their unique interests.

Section 4. Education Information Statistics System

1. Project Overview

The education information statistics system (hereinafter EDS), provides users with one-stop statistics populated with analyses, data, information and numerous other services. EDS also provides access to the complete collection of information collected from organizations linked to EDS. The accumulated data contributes to making proper data-based educational policies.

[Figure 4] Education Information Statistic Understanding



2. Main Projects

A. Information Link System

Information accessible via the EduData DB can be categorized into 1,264 categories and 27,297 subcategories. Resources from primary and secondary schools are linked to others via the school information notification service, NEIS, EDUFINE, primary and secondary education statistics, special education statistics, CSAT, national standard satisfaction survey results and more. Higher education includes statistics of higher education, career statistics, lifelong education data, financial data, university loans and tuition, university libraries and other statistics.

B. Standard Report Developed

Accepting an MOE and regional offices of education proposal, a standard report

containing valid and applicable referenced data was developed. The MOE supplied 109 reports whereas education offices submitted 125 reports to calculate labor statistics more efficiently and for use in internal governmental investigations and cases when deemed necessary.

C. Research Development through EDSS

While the EDS system is largely used by policy makers and administrators from the MOE and KERIS. EDSS targets researchers to promote academic research. EDSS collects, links, process and parse the data found in MOE DBs, offices of education, educational organizations and educational institutes so that upon research requests, such information can readily be provided subject to the required procedural certification process.

3. Main Outcomes

Based on April 2014 statistics, EDS usage by regional offices of education has increased 2.4 times when compared to the year prior. This dramatic increase indicates that EDS in fact prevents the unnecessary reproduction of statistical documents and effectively reduces the amount of paperwork each teacher is normally subject to. Furthermore, it is ultimately promising to see that EDS can serve as a data-based policy making management system. The provision of education related research data via the EduDatSERVICE system has in turn strengthened the academic research support system. Since 2013, the MOE has hosted academic paper competitions and symposiums to encourage and promote the academic and research endeavors of researchers.

Section 5. Business Management System for City and Provincial Offices of Education

1. Project Overview

MOE development of the 'Digital Document System per School' originated as one of seven strategies to encourage school faculties in 2006. To facilitate effective communication and partnerships amongst the MOE, regional offices of education, educational institutes and local schools, the users' work and functions are to be uniformly organized; also the entire document production process - production, execution, and distribution - will be digitalized under the MOE's management mobilization.

2. Main Projects

A. Regional Education Classification System

The Regional Education Classification System (RECS) is a model program designed to systematically organize and utilize information and work from regional education administrative bodies and local schools. RECS is categorized as either a 'Function Category' or 'Purpose Category'. The function category separates regular work performed by each school into the following areas namely: policy, policy details, long-term performance, medium-term performance, and short-term performance and unit assignments.

B. Managing System

The RECS managing system comprises 10 categories and 163 specific underlying systems. To support the RECS managing system, there are two separate systems namely the regional education functionality unit system and user support service system. The regional education functionality unit system has 5 categories and 42 specific underlying systems whereas the user support service system has 10 categories and 32 specific underlying systems.

[Table 23] 2013 & 2014 Managing System Support Performance

(Unit : numbers)

Classification	Support Type	Support			Classification	Support Type	Support		
		'12	'13	'14 first Half			'12	'13	'14 first Half
Information Management	Resource Management	242	192	99	Administration Management	Training & Construction	18	15	3
	Back-up Support	55	43	11		faculty training	21	23	16
	DB Management	52	49	2		solution improvement	7	8	5
	Quality Improvement	21	32	11		others	47	38	170
Total		361	316	123	Total		93	84	194

3. Project Outcomes

The managing system for city and provincial offices of education, since its inception in 2011, has laid the foundation to systematically record and manage regional education organizations' production of public documents and other office work. The system also brought about the standardization of all administrative paperwork that led to the following trickle effects:

Firstly, the system classified different and complicated education and administration work using 'Function categorization' and enabled systematic work management via the standardization of documents, conferences and decision-making processes. Secondly, the managing system incorporates the decision-making process in its entirety, ensuring

administrative transparency and responsibility. Thirdly, the managing system allowed the workforce to acquire special know-how and important experience, thus allowing personnel to better facilitate similar kinds of work and enhance work efficiency.

Section 6. Pre-primary Tuition Support, e-Kindergarten

1. Project Overview

Informatization in kindergarten education has been symbolized by policies such as the ‘Kindergarten Notification System’ and government support for preschool tuition expenses. ICT in kindergarten is by and large based on the ‘Preschool Education Advancement Plan’ that was first announced on November 13, 2009. The e-childschoolinfo and e-kindergarten programs developed are still in operation.

The MOE drafted the ‘Preschool Infrastructure Development Plan to Revise Consumer-Centered Preschool Education Policies’ (November 6, 2008), in order to better facilitate the informatization process occurring in the kindergarten education sector. In 2009, e-kindergarten was developed to support less privileged children from the low-income families. In January 2010, the e-kindergarten program was connected to the Social Welfare Management Network and convergence took place in August the same year. Therefore, a number of support projects carried out under previous policies were revised or reallocated. Concrete examples of implementation include the following: 2012 onwards, ‘Free Education for All Children Under 5’ with which children aged 3 to 4 receive free education pursuant to being part of the lowest 70% total household income group, and ‘Free Education for All Children Aged between 3 and 5’. The e-kindergarten program has additionally been revised accordingly to complement and synergize other existing welfare and financial support programs.

2. Main Projects

A. Overview

The MOE is wholly responsible for policymaking and execution of ‘e-kindergarten’ whereas the regional offices of education plan policy visions and directions, deliberate on important agendas, manage and support kindergartens falling under their jurisdiction. Furthermore, KERIS was designated as the kindergarten informatization agency (as of December 2002) to lead e-kindergarten related programs and products.

B. System Development

The e-kindergarten system is administrative per se and directly operated by kindergartens and regional offices of education to financially support children aged 3 to 5 attending kindergartens, regardless of the kindergarten being national, public or private. The e-kindergarten system links with the social welfare general management network (Happy e-Connect) to provide additional features e.g. verification of financial support eligibility status and management of possibly redundant financial support due to child support and childcare. These services are carried out in conjunction with financial institutions such as banks for obvious reasons and large partners include Nonghyup Bank and Busan Bank amongst others.

C. Financial Support

Qualifying has been discussed above yet in order to receive financial support, parents or legal guardians must apply for a specialized card (Child-Happy-Card) from banking institutions (Nonghyup Bank and Busan Bank). Upon receiving the card and registering it with a qualifying and corresponding kindergarten, support will be forthcoming. Kindergarten fees are automatically taken care of on a quarterly basis.

3. Main Outcomes

Tedious, time-consuming and manual applications for each student switched to the utilization of online information services. This effectively resulted in the reduction of parental, student and regional offices of education workloads. The welfare security net was revamped and the fight against possible corruption enhanced.

[Table 24] 2008~2014 Project outline

year	Applicants				Nationwide Financial Support			
	5yr	3~4yr	Multi-	Subtotal	5yr	3~4yr	Multi-	Subtotal
2008	133,135	129,912	16,840	279,887	205,287,725	139,457,750	11,482,670	356,227,945
2009	134,216	153,505	13,585	301,306	197,910,744	194,639,414	9,233,826	401,783,984
2010	140,254	176,179	37,145	353,578	211,922,685	208,580,697	33,998,418	454,501,800
2011	133,099	212,526	6,151	351,776	207,792,853	375,297,789	8,638,515	591,729,157
2012	255,648	229,463	7,194	492,305	545,701,703	549,704,202	15,144,636	1,110,550,541
2013	285,981	402,582	-	688,563	670,983,921	1,015,226,778	-	1,686,210,699
2014 (august)	275,462	406,401	-	681,863	457,714,823	724,620,268	-	1,182,335,091

※Since 2013, support for multicultural families has been incorporated into the '3~5 year Nuri-Curriculum'
Source: E-childschool System 2014

ICT in Higher Education

Section 1. University Support

1. Informatization in University: Infrastructure Development and Management

A. Project Overview

To enhance the university information system and improve the quality of university education services, the MOE is supporting universities in strengthening their IT infrastructure. Amongst other examples of IT support provision include educational computer network management, university e-learning support center content development, KOCW design, research on university informatization etc.

B. 2014 Projects

1) Educational Computer Network

The Educational Computer Network, established in 1991, was the largest computer network in Korea and significantly contributed to internet communication industry development.

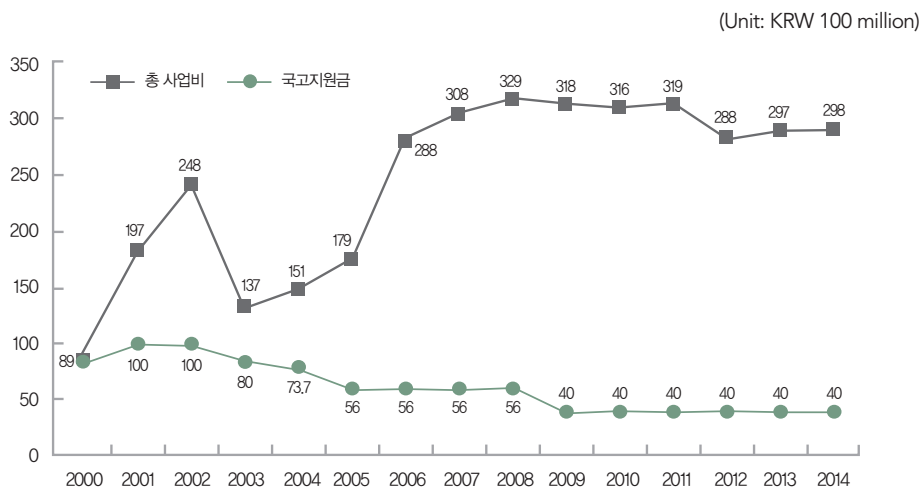
In 2001, the physical platform of the service was decommissioned in favor of utilizing commercial networking services in order to better keep pace with rapidly growing communications at universities and to provide a more stable network with 24-hour surveillance and a dedicated problem-solving team. In 2009, to support customer-based services, commercial services provided at that time were increased from two to four. However, only two communication service providers are participating in actual service provisions. As of September 2014, there are 402 organizations using the current educational computer network.

[Table 25] Educational Computer Network Membership Status (366 Universities & 36 Other Organizations)

Classification	National & Public Universities	Private Universities	National & Public Colleges	Private Colleges	Cyber & Open Universities	Graduate Schools	Schools under other Gov't dept.	MOE Organizations	Others	Total
No. of Organizations	44	155	8	127	12	16	4	11	25	402

Source: Korea Educational Computer Network Headquarters (September 30, 2014)

[Figure 5] Educational Computer Network Spending & Financial Support



Source: Korea Educational Computer Network Headquarters (September 30, 2014)

In 2014, the MOE provided official financial support valued at KRW 4 billion i.e. 13.4% of its entire 2014 budget. 366 universities have been afforded the use of the internet service thanks to support for the relevant contract (115.2GBps) between MOE and the contracted providers. Moreover, the Korean Education Network Management Headquarters has been supporting research in terms of university digitalization since 2002. In 2014, the focus shifted to security checks and the assignment was tendered along with MOE support worth approximately KRW 120 million.

Special Information Technology (IT) education and international education has been provided from as early as 2003. Since 2007, a consigned education organization has led various workshops and lessons to develop education curricula. In 2014, specialized education courses in programming, network optimization, information security, wireless local area network (LAN) and other subjects were taught to 499 people across 235 universities.

2) University E-Learning Support Center Development

The Korean government committed itself and established 10 e-learning university support

centers and developed new e-learning contents between 2003 and 2007. The designated support fund for these e-learning support centers totals KRW 13.8 billion and 544 content development projects have been made possible thanks to support for e-learning.

University e-learning support centers expanded the quantity of inter-university lectures via content development in addition to providing lectures free of charge for local residents, thus providing lifelong learning opportunities in the process. These lectures will remain available even during mandatory military service. During the first half of 2014, the equivalent of one semester, there were 677 ongoing lectures with 110,303 enrollments. Since 2009, any and all e-learning contents developed using government funds are openly available to the public, free of charge, via Korea Open Course Ware (KOCW).

2. University Studying and Learning Information Sharing Service

A. Construction and Operation of Korea Open Course Ware (KOCW)

The Korea Open Course Ware (<http://www.kocw.net>) service was designed for the optimal sharing of university open lectures and relevant studying materials. KOCW started trial services in December 2007, offering over 200 courses from more than 40 universities. In December 2009, the official website and homepage of KOCW services were created to fully launch support for university studying and learning information. KOCW is the national open information, open-source learning hub that systematically and categorically collects and disseminates high quality university lectures and educational contents. It is the Korean national response to global trends in Open Educational Resources.

[Table 26] Annual KOCW Content Growth

(Unit : numbers)

2011		2012		2013		2014	
Lectures	Resources	Lectures	Resources	Lectures	Resources	Lectures	Resources
2,769	37,714	4,638	63,395	6,800	98,462	8,371	110,406

Source: Korea Education Research Information Service (KERIS) (June 2013)

B. University e-Learning Support Center

Since 2009, the MOE has carefully researched and surveyed Korean university e-learning environments and have since released its findings. In 2011, 189 universities participated in the surveying, in contrast to 138 universities a year later in 2012. In 2012, 131 schools actively utilized e-learning i.e. rounded off as 95% of all schools that partook in the survey that year. In 2013, 161 schools actively utilized e-learning,

indicating growth. Please refer to [Table 27] and [Table 28] for a detailed breakdown based on faculties and/or departments.

[Table 27] Categorical Status of University e-Learning Content Usage (Unit : numbers)

Year	Liberal Arts	Social Sciences	Education	Engineering	Natural Sciences	Pre-med	Practical Arts	Total
2011	1,676	1,853	293	821	485	95	242	5,465
2012	1,749	2,174	460	1,007	654	124	366	6,534
2013	1,795	2,629	442	1,024	530	110	541	7,071

Source: 2013 Secondary Education e-Learning Status (KERIS)

[Table 28] University e-Learning Contents Categorization (Unit : numbers)

Classification	2011	2012	2013
Electives	1,378(25.2%)	1,607(24.6%)	1,884(26.6%)
Major	3,785(69.3%)	4,393(67.2%)	4,818(68.1%)
Union	25(0.5%)	43(0.7%)	38(0.5%)
Non-Union	277(5.1%)	491(7.5%)	331(4.7%)
Total	6,893(100%)	6,534(100%)	7,071(100%)

Source: 2013 Secondary Education e-Learning Status (KERIS)

Section 2. Status of Cyber Universities

1. Cyber Universities and Cyber Graduate Schools

Cyber Universities use virtual learning spaces made possible with IT, multimedia and related software technologies to allow the learning experience to take place wherever and whenever based on a student's preferred timing and location. Upon successful satisfaction of the course requirements, undergraduate or postgraduate degrees can be conferred.

A. Cyber University Overview

1) Cyber University Introduction

As of September 2014, restricted by the 'Higher Education Act', there are 19 official higher education institutions throughout Korea. In addition to 19 cyber universities, there are two lifelong institutes that are considered as distance-learning universities.

2) Cyber University Attendees

Cyber university attendees have increased over the past five years, which can be attributed to the rapid growth of the internet and a growing interest in certifications

amongst younger people. Interestingly, there has also been also a decrease in the number of students in 2014 due to slower expansion of such universities.

B. Cyber University Current Statistics

1) Specialization of Cyber University

To strengthen Cyber University's overall competitiveness, the National Competency Standards based Curriculum Revision Project was activated (NCS). NCS-based education places emphasis on a student's ability to 'perform the given curriculum's specified lessons and/or skill sets accordingly'. It demands an extremely thorough evaluation of student learning, which immediately poses a new problem to cyber universities that teach via online lessons. Meanwhile, there has been continued support for 'Cyber Universities' Job First, School Later Program' since inception in 2012.

2) Improvements of Cyber University: Quality and Infrastructure

The MOE has consigned three imperative research tasks to KERIS that have been named Cyber University Growth Strategy and Role Making, Cyber University Evaluation Standards and Cyber University Founding Philosophy Revision. The aforementioned tasks' aims are to achieve study and learning standards improvements. KERIS, after having collected research data and subsequent consultations with cyber university students, will publish a book to act as the blueprint for future improvements and targeted growth at cyber universities.

3) ASEAN University e-Learning Support Project

Of the Republic of Korea has, and shall continue to share its hard earned expertise in e-learning from experience and knowledge with other ASEAN members, with the sole reason to assist in uplifting the quality of e-learning in the region.

2. Korea National Open University (KNOU)

A. KNOU Overview

KNOU has 22 academic departments allocated throughout four different academic locations, which include the College of Liberal Arts & Science, College of Social Science, College of Natural Science, and College of Education. It also offers 19 master's degree courses at graduate schools.

KNOU is offering its well-known KNOU-centered blended learning environment development via prime college programs to promote and help expand the government-sponsored lifelong education program. KNOU additionally established a general education institute that provides lifelong education epitomized by the characteristics of openness, diversity and flexibility along with various learning courses.

[Table 29] KNOU Student Age Group (Undergraduate)

(Unit: persons&%)

Total	Under 20	21-25	26-30	31-35	36-40
142,332	1,978(1.4%)	13,329(9.4%)	17,997(12.6%)	22,232(15.6%)	21,978(15.4%)
41-45	46-50	51-55	56-60	61-65	Over 66
27,552(19.4%)	16,654(11.7%)	10,739(7.5%)	6,250(4.4%)	2,256(1.6%)	1,367(1%)

Source: KNOU 2014 Statistical Manual

[Table 30] KNOU Student Age Group (Graduates)

(Unit: persons&%)

Total	Under 25	26-30	31-35	36-40
1,975	23(1.2%)	140(7.1%)	288(14.6%)	302(15.3%)
41-45	46-50	51-55	Over 56	
619(31.3%)	200(10.1%)	352(17.8%)	51(2.6%)	

Source: KNOU 2014 Statistical Manual

B. Prime College Development

The MOE is utilizing KNOU as a strategy to invigorate its 'School Later Education Plan'. The 'Job First, School Later' curriculum comprises batcher's degree curricula and other non-degree curricula such as Basic Curriculum and Consignment Curriculum for workers. Since 2012, the 'Second Life Design' and OER (Open Educational Resources) services were developed and initiated for individuals aged 40 to 50.

C. Lecture Content Development

KNOU offers all courses using the information and communication channel. Depending on the course's nature, this might encompass the use of TV, audio or e-learning (multi-media and web) sources that are carefully preselected to best develop a series of lectures prior to release and distribution.

[Table 31] Types of Lectures

(Unit : numbers)

Classification		2009	2010	2011	2012	2013
TV	Undergraduate	390	555	665	392	344
	TV Lifelong Program	158	209	301	276	273
	Prime College	-	6	-	83	157
	Subtotal	548	770	966	751	774
Audio	Undergraduate	374	225	127	106	-
	Prime College	-	-	-	-	-
	Subtotal	374	225	127	106	-
Multi-media	Undergraduate	1,800	1,876	2,616	2,505	1,964
	Prime College	124	110	-	-	-
	Subtotal	1,924	1,986	2,616	2,505	1,964
Web	Undergraduate	665	45	45	35	-
	Graduate		25	31	97	1,388
	Prime College	-	15	10	90	659
	Subtotal	665	85	86	222	2,047

Chapter 4

ICT in Academic Research

Section 1. Status of ICT in Academic Research

1. Informatization of Research in Universities

A. Project Progress

The required investment for the informatization of university libraries is considered to have commenced with the 9th IBRD Educational Loans Grant Program (1993-1997). Informatization leading up to the year 2000 placed a heavy emphasis on the expansion and simultaneous amelioration of basic equipment and software requirements for informatization of university libraries. This commenced in 2001 with the production of information catalogs and relevant databases (DBs).

The digital knowledge information circulation system, 'dCollection', was completed in 2003 with the intention to materialize an electronic circulation system aimed at all university-created research outputs. 'dCollection' recently completed its distribution across 230 universities in June 2014.

[Table 32] 2003~2014 Status of Distribution of 'dCollection' System

(Unit : numbers)

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 (June)
No. of Universities (Accumulated)	4	20	40	62	206	206	211	212	216	220	226	230

In February 2014, the 2nd General University Libraries Development Plan (2014~2018) was announced. The key points of the development plan focused on expansion of university licenses with regards to international academic DBs, construction of university scholastic information support centers, development of an academic information digital distribution network and public application, creation

of a comprehensive academic information system, improving library faculties' work performance, and lastly, establishing the appropriate legal system and infrastructure with the capacity to lead digitalization at universities.

Currently, there are many projects in the works to secure foreign academic resources at universities. To name a few, there are joint projects with foreign academic DBs, continuous collection and expansion of access to international scholarly magazines, and the construction of new Foreign Research Information Centers (FRIC). The aforementioned are some concrete proof of attempts to secure foreign academic data and resources and make them readily available to students and lecturers at universities. In the case of foreign academic DBs, KERIS has expanded its overseas DB university license. KERIS is currently servicing 22 academic DBs. Since 2012, KERIS developed and has been providing a comprehensive search service of foreign DBs via RISS.

FRIC selected 'EhwaWomans University' (Education and Social Sciences) and Chungnam National University (Public Administration and Management) in 2011 to serve as centers. In 2013, GyungSang National University (Environment and Energy) was added to the list, bringing the total to 10 FRIC centers in 11 categories.

B. Status of University Library and Digitization

University libraries are spending more money to purchase already digitalized academic resources, as such, the money spent on traditional books and booklets is in decline. On average, each national and public university owns roughly 930,000 books physically in storage at these libraries. When one compares this statistic with the average of private university holdings of 570,000 books per school, the national and public school libraries still have much resources and books that are yet to be digitalized. In terms of spending, national and public universities' spending on printed books are approximately KRW 1.9 billion whereas private universities spend approximately KRW 1.0 billion. The difference in monetary spending show an even starker contrast than the difference in books acquired.

When analyzing university's library resource status, it is safe to say that not all resources have been digitalized. However, every university has now been supplied with a DB providing a comprehensive list with all available resources. Also, there are over 700 libraries that have access to a comprehensive and general list of resources offered by KISTI. When considering these factors within the bigger picture, it is a safe assumption that the metadata of all the purchased resources have at least been digitalized at these universities.

C. Overseas Academic Electronic Information Subscription of University Libraries

KERIS procures university licenses for international academic DBs and make them available to researchers from all universities. All universities take advantage of this policy in that they subscribe to all the relevant DBs, helping cut back on related costs by an estimated amount of about KRW 89.3 billion in 2012 (calculated by investment cost subtracted from DB subscription fees that all universities would otherwise be subject to pay for). As of 2013, 22 international DBs are in service with MOE support.

The Academic Library Consortium on Electronic Resources (hereinafter referred to as ACE) at KERIS comprised 22 consortia in 2013 in which 363 institutes took part, and brought about a cost reduction of approximately KRW 97.3 billion. Additionally, 201 institutes from 123 consortia jointly purchased DBs not officially supported with government funding, and saved a further KRW 16.7 billion.

2. Foundation for the Informatization of Korean Academic Research

A. Academic Research Informatization History and Progress

In order to comprehensively support Korea's academic research activities, formation of the academic research information distribution system and network was initiated in 1962, with the founding of the Korea Science Technologic Information Center (KORSTIC). In 1982, KORSTIC and the International Economic Research Institute merged and became known as the then Korea Institute of Economy and Technology. In 1991, the Korea Institute of Science, Technology and Information (KINITI) was established to improve the industry's global competitiveness and help overcome protectionism by external countries regarding technologies. In 2011, KINITI and the Korea Research and Development Information Center (KORDIC) merged into the Korea Institute of Science, Technology and Information (KISTI) in an effort to unite the various information sectors from different government branches and develop a single, more efficient agency to specialize in science and information.

B. Academic Research Informatization Affiliated Institutes

1) National Library of Korea

The National Library of Korea is true to its name as a comprehensive and complete knowledge repository of academic research with more than 1 million registered public users and growing. It possesses 9.38 million volumes and continues to collect on average 0.46 million volumes or more annually.

[Table 33] Status of Collection of Books in the National Library of Korea (Unit : numbers)

Administration	Domestic Books	International Books		Antique	Other forms	Total
		East	West			
2013	335,833	11,695	31,514	995	85,449	465,486
Total	6,443,686	364,764	792,328	273,210	1,500,485	9,374,473

Source: 2013 Annual Report of the National Library of Korea

[Table 34] Status of Collection of Web Resources of the National Library of Korea by Year

Classification	~2011	2012	2013	Total
Web Resources (Websites & Web Documents)	451,169	80,504	103,134	634,807

Source: 2013 Annual Report of the National Library of Korea

The Digital Library Portal (www.dibrary.net) is an online service provided by the National Library of Korea that entered into service on May 25, 2009. Its aim is to encourage all citizens to freely use quality digital content readily available. More than 100 million pieces of digital information are connected to 1,358 domestic and foreign institutes including the original copy DB.

The National Library of Korea selects important texts considered to have scholastic and informational value and creates the original copy DB. This is established by digitalizing the various texts in its possession, promptly disseminating information to all citizens everywhere, thereby reducing the regional gap in education informatization.

2) Korea Institute of Science and Technology Information (KISTI)

The Korea Institute of Science and Technology Information (hereinafter referred to as KISTI) as a hub includes features and functions from the national knowledge information infrastructure to firstly, comprehensively collect, analyze and manage the information on science and technology and industries considered pertinent, secondly, professionally investigate and study such technologies, policies and standardization with regard to the information management and its circulation, and lastly, systematically configure and operate the infrastructure for research and development.

KISTI is also responsible for the establishment of a system capable to collect, control and jointly utilize domestic and foreign information, and promote and support the generation and electronic informatization of knowledge information databases. It is worth noting that KISTI pushed ahead with KISTI Service 2.0 and various integrated services such as 'yesKISTT', NDSL, 'Hay-hyeop-hoi Maeul', and more into National Discovery for Science Leaders (NDSL) after having been the aforementioned service provider since July 2008.

One can search for domestic and international science and technology theses or academic papers via NDSL. NDSL user statistics are depicted below.

[Table 35] NDSL Service Statistics

Classification	2012	2013	Annual Rate of Change
Users	750,000	770,000	2.6%
Page views	5.17 million	6.01 million	16.0%
Affiliated Organizations	79	95	20.6%

Source: KISTI Homepage (August 2014)

Section 2. Sharing and Circulation of Research Information

1. Construction and Operation of Research Information Service System

The Research Information Sharing Service aka RISS, provides research information services for its 2.93 million members (as of June 2014) including professors, undergraduate and graduate school students. The quantity of information retrieved reaches 118.93 million. Research information unavailable in Korea because of restricted access attributable to non-subscription may also be accessed via the Electronic Document Delivery Service (hereinafter referred to as EDDS) enabling the wide-ranging availability of full texts via appropriate procurement service providers.

The KERIS Union Catalog offers further access possibilities through 731 participating institutions, and is the leading information channel accumulating all-inclusive information from Korean university libraries. This collaborative effort helps cut costs and increases work efficiency via data and information sharing.

A. Project Progress

1) RISS

RISS, as of June 2014, has provided academic information services to a total of 293 million professors, graduates and undergraduates. The RISS search engine has become a leading channel for academic information in Korea, having exceeded 100 million hits in 2013 as well as user downloads of 38.77 million digital text cases.

2) Union Catalog Service

The KERIS Union Catalog service procured 4.5 million bits of bibliographic records along with 18 million bits of collection records in 1998 when it first commenced

services. These numbers have since grown to 10.07 million and 50.71 million respectively.

The number of registered KERIS Union Catalog service member institutes has reached 731, which incorporates almost all university libraries and major specialized libraries, as of June 2013, up from 148 libraries in 1998.

3) Inter Library Loan

Inter Library Loan Service membership has grown to 580 as of June 2014 from a paltry 29 in 1999. This is definitive proof that universities actively share research information held as per the conditions of the Inter Library Loan service of RISS.

B. Main Outcomes

1) Research Information Sharing Service (RISS)

RISS services 292 million people as of June 2014, marking its 15th year of operations.

[Table 36] RISS Statistics

(Unit: 1000&%)

Year	2008	2009	2010	2011	2012	2013	2014 (June)
Searches	19,203	23,498	29,098	41,497	59,141	93,289	45,656
Open API Searches	-	3,937	8,586	19,785	25,997	25,645	13,634
Total	19,203	27,435	37,684	61,282	85,138	118,934	59,296
Growth(%)	-	▲42.9	▲37.4	▲62.6	▲39.8	▲39.7	-

1) Search increases attributable to external search OpenAPI

2) Search increases following Naver data linking and initiation of mobile pages

[Table 37] RISS Downloads and Page views

Year	2008	2009	2010	2011	2012	2013	2014 (June)
Page views per day	1,028,002	1,549,388	2,233,628	3,322,750	3,832,595	4,313,317	2,609,805
Downloads (in million)	14.87	18.86	19.82	26.25	32.68	36.77	19.53

2) Union Catalog Service

According to university statistics issued by KEDI, 100% of all four-year degree universities are registered with the KERIS Union Catalog service, holding it true to its name as the nationally representative bibliographic catalog that supports every university's library work on the front line.

[Table 38] 2007~2014 Status of Union Catalog Service Usage

(Unit: 10000)

Classification	2008	2009	2010	2011	2012	2013	2014 (June)
Bibliographic Data	830	863	897	931	967	994	1,007
Holdings Data	3,893	4,089	4,281	4,531	4,729	4,995	5,071
Reference Data	1,090	1,128	2,048	2,103	2,195	2,200	2,231

3) Inter Library Loan Service

The Inter Library Loan Service has historically been the preferred route to follow by any member institute to obtain research resources not in its possession. The utilization rate of this service continued to show annual growth until 2006 when it gradually started declining with the establishment and extension of electronic journal subscriptions and full digital texts.

It has rebounded since 2010 when it enriched holding information and diversified collection channels to incorporate overseas research resources. As of June 2013, the service provides, within 2.8 days on average, its member institutes with over 11,000 pieces of data, a monthly average not possible to obtain online.

[Table 39] Monthly Average Requests for Inter Library Loan Service

(Unit : numbers)

Classification		2009	2010	2011	2012	2013	2014 (June)	
Domestic	WILL	Copy	4,799	5,185	5,827	6,602	7,813	8,157
		Loan	781	806	1,051	1,453	1,957	2,239
		Subtotal	5,580	5,991	6,878	8,055	9,770	10,396
	MEDLIS	5,667	4,917	5,112	4,696	4,943	4,268	
Foreign	EDDS		516	548	467	435	802	965
	Japan NII	Domestic	241	256	282	357	412	413
		Japan	3	6	7	8	5	8
	China CALIS		2	25	19	20	25	23
	Subtotal		762	835	775	820	1,224	1,409

2. Construction and Operation of Digital Research Information Circulation System

A. Project Overview

Digital Collection aka 'dCollection', refers to the establishment of the actual collection of digital information resources and its systematic management and sharing. 'dCollection' as a system provides a function akin to that of a university-oriented information reservoir that collects, conserves, manages and circulates digital information resources throughout a university. As such, it must be distributed to

each university for university libraries to successfully manage all university generated research information and educational data and Digital Collection to provide RISS, operated by KERIS as an integrated service.

B. Main Outcomes

As of June 2014, 3.63 million research journal-published articles and about 1.18 million theses have been acquired to provide about 4.81 million full texts, boasting the largest scale in Korea and is the output of a good many universities and research institutes. 20 universities commenced collaboration for the purpose of common use of the theses and distributed the service to 229 universities by the end of June 2014, improving overall theses in quantity and more importantly, in quality. Every year, around 60,000 to 70,000 dissertations are collected via 'dCollection'.

[Table 40] 2007~2014 Status of Construction of Full Text Services of Theses in RISS (Unit : numbers)

Classification		2007	2008	2009	2010	2011	2012	2013	2014 (June)
Domestic	Holdings	255,906	256,000	256,050	256,038	256,028	255,999	255,968	255,958
	Link	350,468	429,869	513,983	607,399	679,092	787,443	860,745	896,335
Foreign		24,467	24,467	24,464	24,473	24,474	24,474	24,454	24,448
Total		630,841	710,336	794,497	887,910	959,594	1,067,916	1,141,167	1,176,741

※Holdings: Number of Original Theses collected by KERISdCollection system

※Link: Number of Original Theses collected by universities' dCollection systems

※Foreign: Number of Master's and Doctoral Theses attained internationally

[Table 41] 2007~2014 RISS Academic Papers Original DB Status (Unit : thousands)

Classification	2007	2008	2009	2010	2011	2012	2013	2014 (June)
Holdings	516	525	478	568	489	503	535	401
Link	600	655	1,915	2,169	2,339	2,679	2,966	3,087
Total	1,116	1,180	2,393	2,737	2,828	3,182	3,502	3,625

※Holdings: Number of Original Theses collected by KERISdCollection system

※Link: Number of Original Theses collected by universities' dCollection systems

ICT in Lifelong Education

Section 1. Lifelong Education Information Network Service

1. Project Overview

KERIS is building a national lifelong education information network service to better reach neglected and marginalized groups in terms of informatization dubbed a national project as the ‘National Lifelong Education System for a Hundred-year-old’. The project will improve public institutions capacity to continue lifelong learning education with information scattered throughout institutions, including the quality of public education resources (OER, Open Educational Resource) customized to the needs of the following groups: the elderly, women and the disadvantaged. The project aims educational services available to everyone.

2. Main Outcomes

A. ‘Smart Lifelong Education Communication General System’

Between June 2013 and January 2014, the Smart Lifelong Education Communication General System was created and subsequently selected as strategic research assignment. The project’s main purpose is the completion and realization of an online lifelong academic and learning system and to root out its weaknesses while enhancing its strengths.

B. The Third Lifelong Education Master Plan

In September 2013, the MOE initiated the ‘Third Lifelong Education Master Plan’ as strategic assignment. The project’s purpose is to thrust cooperation and association between central and regional government branches to complete the lifelong education program.

C. Government 3.0 Plan

Online lifelong studying and learning support structures have been chosen as a Government 3.0 model project. From February 2014, Government 3.0 will actively issue public information, drive diversity and foster better understanding for all concerned. Government 3.0 is a governmental policy platform that seeks users to actively engage and participate in sharing public information amongst one another.

D. Information Strategic Plan (ISP)

From December 2013 to May 2014, the Information Strategic Plan (ISP) was designed to accelerate the online lifelong study and learning support system. The main contents of ISP consulting involve analyses of the current lifelong education informatization process, development and distribution of online lifelong learning and studying programs, conferring to the younger generation future-oriented blueprints and visionary models for sustainable success.

Section 2. Support Services of Lifelong Education System

1. Adult Literacy Education Support System

A. Project Overview

Adult Literacy Education refers to education that not only supports adults to acquire literacy and basic mathematical knowledge, but also support them to fully equip themselves with the life skills considered imperative for survival in today's society. In 2006 the MOE and NILE have initiated the 'Adult Literacy Education Support Program'. It will provide illiterate and uneducated adults education opportunities to improve skills required to maintain quality of life standards and bridging the educational gap in Korea.

B. Work Progress

The Adult Literacy Education Support Program is being led by the MOE and NILE while regional government branches work hand in hand with night schools, welfare centers, schools and other literacy education organizations to run literacy programs. The program began in 2006 by supporting 61 regional government branches and 178 literacy education organizations. In 2013, support increased to include 130 regional government branches and 261 literacy education organizations - amounting to almost 50% of all Korean regional governments and literacy organizations - in the literacy education support program.

[Table 42] 2013 Adult Literacy Program Participants

Type	Literacy 1	Literacy 2	Literacy 3	Middle School	Total
Program*	494	233	150	87	964
	(51.2%)	(24.2%)	(15.6%)	(9.0%)	(100%)

Source: NIFE 2013 Lifelong Manual (May 2014)

Since 2013, in order to build support for adult literacy, such support programs received support and promotion through the development homepage (<http://www.le.nile.or.kr>). The adult literacy support project website has been has been tasked with mainly four functions.

Firstly, NILE service supports educational institutions and program searches enabling students and families to locate proximate literacy organizations. Secondly, NILE service provides what is called ‘Academic Madang’, where a volunteer teacher can freely contact the needy party. Thirdly, the setting for ‘Information Madang’ was created to notify literacy related network advertising to users, allowing them better options and the possibility to reconsider career options.

C. Main Outcomes

The creation of adult literacy education via the designated support program homepage, allows more than half of all regional organizations and over 300 literacy organizations to effectively share employment and business management related information. It is now also possible to contribute to different types of work. The literacy program additionally allows students to assess personal differences with the provision of different academic resources to dissimilar children. The learners associated with this literacy program can have further access to additional high quality documents.

2. Parent Support Information Service

A. Project Overview

The Parent Resource Information Service is an online information system operating with the purpose of providing online educational information in order to strengthen the credibility of the core subject of parenting skills. It’s currently offered via both standard website and mobile optimized site and has since March 2013 also been offering a cyber-training system.

B. Project Status

‘Parent-Onnuri’(www.parents.go.kr) provides useful information on the latest

education news and parental education including a webzine published by the Parent Resource Center online information system, operational across Parent Resource Center parenting resources. In addition, parents can offer other parents support within their local school group. You may volunteer your contact information and help with counseling of parents by offering support and guidance via a link on the home page.

Parents can enroll in online courses irrespective of time and location. The following seven categories of online curricula, along with special curriculum such as offline training, are available based on demand.

[Table 43] Online Education Center Curriculum

No.	Classification	Curriculum	Sessions
1	Permanent Courses	Self-directed Learning Group Manual	15
2		Happy Education for Children	6
3		Happy Education for Parents	5
4		Career Guidance with Parents	7
5		Fostering Creativity for Parents	8
6		Economic Education for Children	8
7		Free Semester Parent Training Manuals	5
8	Special Course	Captivating Students	6

C. Main Outcomes

‘Parent-Onnuri’ is constantly updated with the latest news for parents. 3,000 relevant news articles and other data have been posted. Total membership equates to 60,835 while the number of visitors have topped 1,905,685.

3. Central Multicultural Education Center Information Service Development

A. Project Overview

The MOE does its best to keep pace with multiculturalism. This is evident from the establishment of plans such the ‘Multicultural Student Education Advancement Plan’ (2012), and has been consigned as National and Central Multicultural Education Center. The ministry is also pushing to build and operate additional multicultural education center information services.

B. Main Outcomes

The National Institute for Lifelong Education(NILE) has undertaken and simplified the Central Multicultural Education Center homepage and archives to

make information and materials even more accessible. The homepage now provides the latest data, trend analyses on multicultural education, multicultural education, and information networking, multicultural education policy, promotion and public relations etc.

C. Homepage Satisfaction Survey

The Central Multicultural Education Center conducted a satisfaction survey and website operational status drills from February 6 to 17, 2014 to collect information for the best possible improvements. Data indicate survey respondents with overall satisfaction as high as 88%, and further disclosed that website content, design, practices, and connection speeds are generally satisfactory.

ICT in Career and Vocational Education

Section 1. Career and Vocational Education Service

1. Project Overview

In 1999, the MOE commissioned CareerNet 1.0 - a comprehensive career and vocation information network website - to provide information on career options and assist people in making informed decisions. CareerNet 2.0, which started services in 2006, witnessed the stable provision and expansion of these services. In 2012, CareerNet 3.0 came into existence; CareerNet's system underwent duplicity processes to increase stability and effectiveness. CareerNet also developed and operate mobile applications on future careers, CareerNet counseling and CareerNet career aptitude testing.

2. Project Progress

A. Improvements in 2014

Improvements made in 2013 focused on responding to increased usage and popularity of mobile devices and social networking services (SNS). In 2014, the 'Really Simple Syndication' (RSS) function realized more efficient and convenient usage of the service. Another major improvement project is taking place throughout 2014 i.e.the development of an online career planner.

B. SNS Services

CareerNet created accounts in its own name on numerous SNS sites e.g. Facebook, Twitter, ClassTing and more. From its SNS accounts, CareerNet is performing public services to upload (some regular and other infrequent) career information. ClassTing is a social network service designed for school teachers and students to share information. CareerNet initiated the 'career finder' open class on ClassTing that encourages students

to carefully contemplate their career options. As of June 2014, more than 2,500 students and teachers have completed membership registration for ‘career finder’ open class.

3. Main Outcomes

A. Membership Expansion

Since the launch of memberships in 2002, the number of CareerNet members have sharply been increasing annually. In 2013 alone, a staggering 955,821 new members registered on CareerNet. At the time of writing in 2014, on average of 2,855 new members were joining CareerNet daily and at present, CareerNet boasts over 8 million members.

[Table 44] Accumulated Number of CareerNet Memberships (Unit : persons)

Year	New Memberships	Average Number of New Members (Daily)	Total Number of Members
2002	132,931	364	132,957
2003	234,666	643	357,601
2004	271,333	743	627,401
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	2,714	4,696,069
2011	967,040	2,641	5,663,027
2012	918,682	2,517	6,581,791
2013	955,821	2,612	7,537,612
2014. 6.*	522,498	2,855	8,060,110

* Statistics for 2014 indicate membership status leading up to June

B. Main Contents Usage

Usage of the career psychological or aptitude test breached the million mark in 2006. Since 2010, it has been used more than 2 million times annually. In the case of cyber career counseling, the program and its services were enhanced in 2013 and over 30,000 counseling sessions are being executed annually.

In total, CareerNet has 8 different career psychological testing tools. In 2013, these test tools were used 2,822,531 times. The most popular and widely used psychological test was the vocational aptitude test, followed by career interest type-K, career values test and so on.

C. Mobile Application Usage

Three mobile applications developed by CareerNet have been downloaded 322,938 times since initial availability in January 2013. In particular, the future career application was downloaded 75,794 times, the career counseling app 75,794 times and the psychological test app 237,380 times.

Section 2. Human Resources Information Service

1. Project Status

KRIVET established, and has been operating the National Human Resources Development General Network (hereinafter referred to as NHRD.net) (www.nhrd.net) since 2001. The main function of NHRD.net, as the designated general information portal on human resources, is to share publically and nationally information on human resource policies and related statistics. The intention is to improve public awareness regarding human resources development and to educate the public about these policies.

2. Main Outcomes

NHRD.net members reached 5,836 at the end of October 2014. According to membership statistics derived from the period between 2007 and 2014, the majority of members was composed of business people and teachers, accounting for 25.3% and 14.5%, respectively, followed by students, researchers, and public service officials at 11.4%, 8.8% and 8.7% respectively.

NHRD.net renovations in early 2012, was followed by a steady increase in the number of visitors, recorded at an average of 48,995 per month in 2013. The rising trend continued, as the first half of 2014 monthly average was 102,765 visitors.

[Table 45] 2013~2014 NHRD.net Monthly Pageviews

(Unit : numbers)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Monthly Avg.
2013	45,485	49,218	36,220	52,170	41,246	42,934	90,623	54,880	44,626	42,252	37,377	50,911	49,859
2014	68,278	59,033	90,118	106,688	108,684	86,902	125,294	128,755	151,131	-	-	-	102,765

Customer satisfaction survey results indicate that people mainly use the site to collect research information on human resources development (35.5%), investigate

human resources development-related trends (34.6%), and to track information on human resources-related political projects (19.6%).

The majority of users (50.5%) indicated that they are ‘highly satisfied’ with the contents generated by NHRD.net, the rest of the respondents indicating ‘satisfied’ (36.4%) and although the minority, still important, ‘average’ (13.1%). Further survey calculations indicate that 86.9% of all visitors are satisfied with NHRD.net’s contents in all.

Section 3. Private Qualification Information Service

1. Project Overview

In 2009 KRIVET completed the ‘Private Qualification Information Service’ (hereinafter referred to as PQIS) (www.pqi.or.kr) with the main goal of providing the public with appropriately registered, private certificates and the management of this registration system. It also developed its mobile web service (m.pqi.or.kr) in 2011 that allows the public to use personal mobile devices for retrieval and inquiries into content regarding the Introduction of Private Qualification, Information on Private Certificates, Bulletin Board and Information Plaza.

2. 2014 Main Outcomes

A. Membership

The total membership of PQIS equates to 11,000 of which institutions comprise 4,354 members and individual users the remaining 6,646.

[Table 46] PQIS Membership Status

(Unit : persons)

Classification	2011	2012	2013	2014 (June)
Individual	891	2,880	4,534	6,646
Institution	1,566	2,281	3,050	4,354
Total	2,457	5,161	7,584	11,000

Source: KRIVET

B. Contents Held

As of June 2014, the following contents are available via PQIS, 10,381 personal qualification information cases, 96 public notifications and prohibitions of sorts, 244

cases of information on qualification related news, laws and other research related publications. All the notifications and data provided by PQIS can be downloaded into easily accessible file formats.

C. Online Inquiries and Responses

Throughout June 2014, statistics collected showed that a total of 2,325 online inquiries were made that ranged from online inquiries to PQIS member Q&A data. With regards to the online inquiries, there were 340 inquiry cases and complaints that reported false and/or exaggerated advertisements on personal qualifications, 70 inquiries were adjudged useful suggestions and recommendations on personal qualification standards, and finally, 1,905 inquiries related to the Q&A section requesting further information on the registration and authorization system.

D. Additions in 2014

System restructuring in 2013 allowed the scope of information services, limited to private qualifications at the time, to be expanded to include national qualification standards along with the incorporation of very specific clauses on terms of service prohibitions.

Chapter 7

Bridging the Educational Gap

Section 1. Bridging the Educational Gap for Information-Alienated Groups

1. Project Status

A. Personalized Computer Project(PC)

The MOE signed an agreement with various PC manufacturers to supply a large number of PCs in a relatively short time to information-alienated children. As per the agreement, the MOE will obtain computers through capital and/or operational leases over four years for provision to over 50,000 students. Estimations for the investment have been valued at KRW 237.2 billion for this PC support project between 2000 and 2014.

B. Internet Service Payment Support

Those eligible for Internet service payment support increased from 50,000 people in 2000 to 220,000 in 2014. The budget for the support program averaged KRW 13.4 billion for the period from 2000 to 2006. However, the amount increased drastically in 2007 to KRW 28.2 billion and jumped to KRW 47.2 billion in 2014. The average annual spending equates to KRW 39.8 billion yet the aforementioned information paints a much more detailed picture.

[Table 47] 2000~2014 Education Informatization Support Project Status: Cost and Number of Beneficiaries
(Unit: thousands of persons & KRW billion)

Classification	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	total	
Beneficiaries	PC	50	0	0	0	20	26	27	16	11	13	12	21	19	18	11	244
	Internet	50	47	46	49	69	87	123	145	148	152	168	204	230	222	220	1,960
	Total	100	47	46	49	89	113	150	161	159	165	180	225	249	240	231	2,204
Cost	PC	65	175	177	133	240	257	246	147	115	119	109	169	158	136	126	2,372
	Internet	25	93	88	128	174	183	252	282	328	343	366	446	474	473	472	4,126
	Total	90	268	265	261	414	440	498	429	443	462	475	615	632	609	598	6,498

※ Annual Budget Sources:

2000~2003: National IT Promotion Fund (Regional Taxes = 5:5)

2004: National IT Promotion Fund (Regional Taxes = 5:5) & Presidential Directive (Regional Taxes = 7:3)

2005: IT Promotion Fund cut off (Presidential Directive: Regional Taxes = 3:7)

2006: Presidential Directive (Regional Taxes = 3:7)

2007: Only Internet Service Payments Supported (KRW 1.6 billion)

2007~2014: Regional Taxes

C. Cooperation with Internet Service Providers (ISPs)

The MOE entered into an agreement with ISPs in June 2002, allowing for high-speed Internet service payments to receive support and reduce financial liability to a monthly fee of KRW 21,450 per person, 30% below market retail pricing compared to regular consumers. In March 2006, the MOE increased support to further lower monthly fees and reduce liability to KRW 19,800. In order to efficiently manage the payments for Internet services, the MOE, as a single body representing all regional offices of education and schools, committed to payment agreements with ISPs.

2. 2014 Projects

The MOE renews ISP Internet service agreements in three-year cycles. In December 2012, the MOE entered into agreements with KT, SK Broadband, LG U+ and SK Telecom to provide discounts for communication costs and other education services.

The MOE further sought to improve current projects and contracts by consistently sharing information with regional offices of education. By establishing close cooperation structures with city and provincial offices of education, the MOE is acting as the hub for all their projects to ensure smooth operations and avoid obstacles.

Section 2. ICT in Education for the Handicapped

1. Special Learning and Teaching Site (tlc.knise.kr)

The MOE operates the 'Korea Institute for Special Education Study and Learning Center' (KISE) to enable disabled students access to customized education regardless of the students' location and/or affiliation (regular school, special school, home school or other facilities). Teachers may be provided with alternate study and learning tools customized and more suitable to cope with different types of disabilities and/or afflictions students might suffer from.

2. National Special Education Informatization Competition

An annual event is hosted with the primary intentions to bridge the information gap by enhancing the informatization competence of students who stand to benefit from

special education, to improve special education teachers' informatization awareness and raise the quality of said special education by exploring and disseminating informatization good practices.

The 2014 competition being the 12th iteration, was held on September 2 and 3, in the K-Seoul Hotel, and was co-hosted by the Korea Institute for Special Education, Korea Creative Content Agency, CJ Netmarble Corporation and sponsored by both the Korean MOE and MCST.

3. Braille Translation of EBS Broadcast Textbooks for Visually Impaired Students

The MOE sponsors braille translation projects annually to provide visually impaired students with braille translations of EBS textbooks in preparation for the College Scholastic Ability Test (CSAT). An impressive number of 160 textbooks are undergoing braille translation this year alone.

4. KISE Distance Learning Training Center (iedu.knise.kr)

The KISE distance learning training center was established so as to improve teachers' special education expertise, increase the level of cooperation between regular teachers and special education teachers, promote a better understanding of disabled students to all parties involved with special education (preliminary special education teachers, students' parents, etc.)

[Table 48] 2014 KISE Distance Learning Training Center Training Results (September 1, 2014)

Training Types		No. of Training Sessions	No. of Trainees		Training Targets
			Projected	Results	
Teacher Job Learning	61 hours	12	9,440	4,807	Teachers & Professionals in Education Field
	45 hours	1	200	131	Teachers & Professionals in Education Field
	30 hours	8	1,700	861	Teachers & Professionals in Education Field
Subtotal		21	11,340	5,799	
Special Education Support Workforce		5	1,500	1,148	Special Education Supporters
Regular Learning (parents)		15	2,700	1,626	Parents and Other Related People
Subtotal		20	4,200	2,774	
Total		41	15,540	8,573	Target Accomplishment Rate 55.2%

5. Special Education Homepage Web Accessibility Qualification Consulting

Based on the National Informatization Basic Act, section 32, and Disabilities

Discrimination Act, section 21, KISE is following strict standards and qualification requirements granting people access to information and the sharing thereof with regards to the homepage of the special education website.

6. 'Understanding Disabilities' Photography Exhibition and UCC Competition

The 'Understanding Disabilities' photo exhibition and UCC competition, have since inception in 2009 been annual events to promote a better understanding people with disabilities and help in eliminating prejudices against such. These events are open to people of all age groups.

7. Disabilities Lifelong Education Content Development

To offer opportunities for lifelong education and second chance learning to disabled adults, the Lifelong Special Education Project was initiated in 2011. KISE's lifelong special education support site (life.knise.kr) provides education materials developed between 2011 and 2013 for all people with disabilities and lifelong networking institutions.

8. Sign Language Interpreters for Deaf Students, letters Distance Education Support

Regular schools and home schooling ought to provide equal educational opportunities to deaf students as well as those hospitalized. Proper educational support for students in difficult and advanced level classes receive legal protection. Education is a right and not a privilege.

9. Production and Dissemination of Visually Impaired Project Alternatives

As per provisions made in the 'Special Education Act' section 5, the visually impaired can access resources in Braille, digitally enhanced and various forms of educational books and reference books supported by the center through the dissemination of alternative materials to ensure a stable learning environment.

10. Disable Student Career and Job Information System(JobAble)

The Disabled Student Career and Job Information System (JobAble) supports further studies and help with gainful employment for disabled students through horizontal linkages. The website was developed in 2010 and services were initiated in February 2011. In July 2014 registered members totaled 6192 people (3022 teachers

and 3170 students). The average monthly user connections reached 3,048, and website visits came to 24,383 on July 15, 2014.

Section 3. ICT in Hospital Schools

1. Project Overview

A hospital school guarantees students with health issues requiring long-term hospitalization or convalescence lasting three or more months due to tumors, chronic disease, etc., scholastic continuity and the right to education.

Regardless of the class specialty with hospital affiliation i.e. an extreme confined location, this shall be called hospital school for the fact that, preschoolers, elementary, middle and high school students collectively study therein.

A video-aided lecture system, or cyber school, is also offered to the aforementioned impaired students to learn irrespective of time and space. In total, four institutes in Korea currently implement this video-aided lecture system, for which the cyber curriculum has been designed specifically for students requiring long-term convalescence at home or relevant medical institutions.

2. 2014 Main Outcomes

A. Hospital Schools Overview

By 2005, eight hospitals had been officially designated as hospital schools since introduction with Seoul National University Hospital being the first. 21 hospital schools have been added over 3 years in 2006, 2007 and 2008. The numbers seemed to be soaring yet stagnation quickly followed and no more than two were established further. As of 2014 the number remained unchanged at 31. In June 2013, 21 hospital schools were affiliated with offices of education and the remaining 10 with the hospitals themselves.

[Table 49] 2005~2014 Number of Hospital Schools

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
No. Hospital Schools	4	8	14	19	29	30	31	32	31	31

※ Annual data snapshot taken on April 1st

B. Operation Status of Video-aided Lecture System

The video-aided lecture system is being run in 4 regional offices of education. 1,580 students with disabilities attend these lectures.

[Table 50] Operation Status of Video-aided Lecture System

(Unit : numbers, persons)

Region	Name	No. of Cyber Classes	No. of Instructors	No. of Students			Monthly Average No. of Students	Attendance Days for Individual Students
				health impairment	Others	Total		
Seoul	Honey Rainbow School	52	35	675	122	797	690	18
Busan	Dream&Love School	46	24	673	267	940	812	23
Incheon	Incheon Cyber School	12	13	168	6	174	174	20
Chungnam	Chungnam Education Research & Information Institute	12	63	64	4	68	52	20
Total	4	122	135	1,580	399	1,979	1,728	20

Source: Special Education Annual Report 2014 (MOE)

C. Curriculum Progress

Student health conditions effectively determine hospital schools' lesson hours and lesson plans. Customized special education plans are developed by special teachers in hospital schools working in close collaboration with regular teachers, medical staff and parents. The teachers must incorporate students' health and rehabilitation plan into education plans. In the case of academic evaluation, school attendance on the day in question remains mandatory. The school registry of any hospital school student belongs to the original school, and hospital school staff are required to submit reports via mail or fax to the original schools.

3. Main Outcomes

Days of use or attendance per student vary from as few as 1 to numerous years, as does annual frequency. The number of students who used the video-aided lecture system has gradually been increasing over the last five years.

[Table 51] 2010~2014 Monthly Average Number of Students Using Hospital Schools

Year	2010	2011	2012	2013	2014	Total
No. of Applicants	1,005	1,190	1,058	1,293	1,644	6,190

Source: 2010~2014 Annual Report on Special Education (MOE)

[Table 52] 2010~2014 Monthly Average Number of Students Using Video-aided Lecture System

Year	2010	2011	2012	2013	2014	Total
No. of Applicants	1,680	1,698	1,782	1,948	1,979	9,087

Source: 2010~2014 Annual Report on Special Education (MOE)

At the end of every year, all hospital schools are subject to a survey measuring satisfaction of students and their parents. Since 2010, these scores have been significantly high, with annual scores consistently exceeding 80%.

Creation of Healthy Cyber Culture and Privacy Protection

Section 1. Creation of Healthy Cyber Culture

1. Healthy Cyber Culture Activities

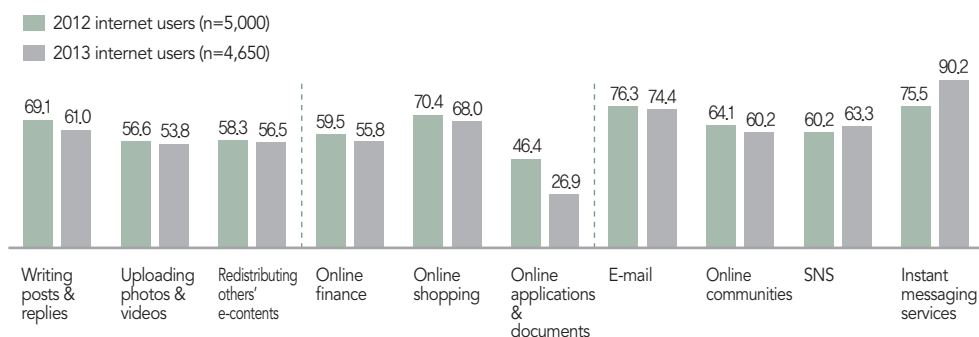
The universalization of the Internet and ICT's sociocultural influences are ever increasing and expanding. As of May 2013, there are approximately 40.08 million people or 82.1% of the national population aged over 3, using the Internet. 95.5% of internet users aged 12 and over are accessing the Internet via smartphones. Among these Internet users, 76.1% are using the internet for more than an hour per day. ICT is both enriching and disrupting peoples' lives by providing convenience and efficiency yet also unexpected side effects and certain forms of abuse or other problems. There is a growing concern over cybercrime, malevolent language violence, illegal information distribution, internet addiction, private information theft and the costs associated with these problems in today's informatization age. The government has been working hard to effectively answer and solve these problems of cyber culture, having developed and enacted numerous policies to better respond and even prevent the misuse of ICT.

2. Project Progress

A. Domestic Cyber Culture and Internet Addiction

Responding to the growing influence of the internet, the Korean government carried out an 'Internet Addiction Survey' so as to statistically analyze cultural and social maturity with regards to IT usage. The results are listed in Figure 6.

[Figure 6] A Typical Internet User's Information Service Usage(Unit : %)



Sources: MSIP-NIA, 2013 Information Culture Status Survey (March 2014)

B. Prevention and Treatment of Internet and Smartphone Addiction

The 2013 Executive Plan for Prevention and Treatment of Internet Addiction allowed for the establishment of an integrated, lifecycle support framework that continuously provides services customized for a specific life phase to help prevent internet addiction, to counseling, to treatment, and to follow-up controls. The plans focus on numerous measures namely responsive measures against the rising number of mobile internet and smartphone uses, efficient prevention, professional counseling, local network creation, and the development and supply of special contents.

[Table 53] Status of Internet & Smartphone Prevention Education

(Units: persons)

Year	2010	2011	2012	2013	2014(June)	Total
Preschool Children	-	31,279	18,200	47,890	26,050	123,419
Adolescents	645,981	954,425	621,621	970,696	407,512	3,600,235
Adults	33,753	90,363	93,001	105,363	25,803	348,283
Total	679,734	1,076,067	732,822	1,123,949	459,365	4,071,937

Sources: NIA (June 2014)

C. National Information and Communication Ethics Education

Diversity in information environments and development of education models have increased the significance of information and communication ethics education contents. There is a real need to incorporate diversity of class, age and knowledge while staying faithful to the objective of pre-existing education programs. Currently, there are 94 different sets of educational contents developed by the government for use in local settings.

[Table 54] Information & Communication Ethics Contents Development Status: 2003~2013

Classification	Textbooks	Movies	Animations	Educational Programs	Total
Information & Communication Ethics	7	33	29	2	71
Cyber Crime Prevention	-	-	21	2	23
Total	7	33	50	4	94

Source: NIA (June 2014)

2. Information and Communication Ethics Education for Elementary and Secondary Schools

A. Overview

The information age is upon us due to ever increasing Internet usage, online games, and mobile devices such as smartphones, smart pads, and more, and with it comes inevitable dysfunctions and adverse effects that increase problems related to defamation, privacy infringement, trolling, to mention but a few.

The MOE announced on February 6, 2012 the Executive Plan for School Violence Elimination at pan-government level, of which fundamental measures have already been undertaken for the prevention of school violence and Internet addiction. It also amended on April 1, 2012 the Act on School Violence Prevention and Measures, classifying cyber bullying as a form of school violence.

In particular, the case guidance manual in schools was renewed to treat cyber violence as serious as actual physical violence, and training sessions pertaining to cyber violence are attended by members of school boards and students' parents against school violence.

B. Main Outcomes

1) Information and Communication Ethics Education in Regular Curriculum

The 7th Curriculum provided information subsequently reflected in the section on curriculum and communication ethics education in the 2007 revised curriculum content. The natural wealth of information and communication ethics education raise hopes of making learning across curricula reflect the expansion regular school hours in 24 subjects.

In addition, information and communication ethics education content are reflected in the curriculum. Curriculum development and creative experiences make the advertisement of online learning contents and activity time contents possible.

2) Prevention of Internet (Game) Addiction and Strengthening Counseling and Training

The Ministry of Education has to provide counseling and treatment and local youth counseling support with parental consent to at-risk students. This support is annually offered in collaboration with the Ministry of Gender Equality and Family following analyses of the youth Internet usage habits census.

In addition, with regards to the Internet culture of children and young people, major ICT dysfunctions have been either identified or resolved, proper SNS and gaming practices are in place thanks to the focus on details related to Internet usage and habits census. The commitment to prevention since September 2012 leads teacher training, and each city and provincial unit has laid the foundation for proper training in prevention and handling.

3) Policy Research

Pan-governmental analyses of domestic and international promotion status and situations have aided in the establishment of a comprehensive ethics policy that in turn positively impacts school onsite policies, and necessary changes to information and communication technologies for dysfunction prevention. This includes information and communication ethics orientation at schools with proposed guidelines on information and communication ethics.

In addition, a diagnostic tool to measure and derive guidelines have been developed with due consideration of class curriculum, experiential activities, a variety of creative teaching and learning activities in schools and communication technologies (smart devices included), analyses of the pros and cons of ICT utilization.

4) Inter-Governmental Collaboration

Leading agencies in national informatization are at the forefront of active cooperation between government departments. Their focus have been on addiction prevention, remedy, and relapse guidelines, copyright protection and gaming addiction prevention and remedy, harmful information blocking, content distribution and programs using contests, campaigns and advancing various policy initiatives.

In addition, the MOE and KERIS liaise to dispatch a joint representative to participate in city council meetings and gatherings for the effective and smooth promotion of education agency business ethics and other dimensions of information and communication policies.

Section 2. Prevention of Informatization Adverse Effects

1. Educational Institutes 'Personal Information Protection Policies

As the Personal Information Protection Act was sanctioned in 2012, information agencies including the public, students, parents, and other interested parties, continually raise awareness and closely monitor this imperious issue.

A. Personal Information Protection Policy and System

The MOE set the standards for the smooth progress of privacy protection at education service institutions by distribution of the seven revised laws based on the Privacy Act amendment and enforcement. To present professional and rational analysis of standards in privacy guidelines established, the MOE secured systematic and coherent privacy services, privacy management-level diagnostics e.g. a planning director and practitioners, and promotion of privacy awareness educational tours.

[Table 55] MOE Revised Laws Implementation Status

Classification	Law	Contents
1	Regulations on Teacher Protests	Appeals reviews, administrative litigation (recoverable costs, etc.)
2	Education Officials Act	Appointment & promotion of qualified candidates
3	Private School Act	Principals, teachers, fixed-term appointments, dismissals & disciplinary decisions
4	Gifted & Talented Education Promotion Act	Student Records
5	Infant Education Act	Information gathering, Steering Committee, & support costs
6	Elementary & Secondary Education Act	School Development Fund Trustee, School of Accountancy, School Committee confirmed disqualifications, & academic adjunct teacher employment eligibility verification
7	School & Health Act	Student health checks & vaccinations

B. Personal Information Protection and Its Promotion

The MOE has for each of three zones expanded educational opportunities with privacy handlers who are responsible for institutional information privacy through the information security education center. Specifications have been established for building operations and cyber online education to enhance the capabilities and privacy of business representatives.

[Table 56] 2012~2014 Information Security Training Center Training Performance (Unit : persons)

Year	Set	Cyber	Inclusive	Total
2012	3,575	7,719	1,103	12,397
2013	5,438	11,180	25,468	42,086
2014	8,635	3,557	3,972	16,164

※ Inclusive Education: Cyber-hacking and information Security Education & Privacy Training

Source: MOE and Information Security Training Center (August 2014)

C. Personal Information Protection System Operation

The MOE has inspected a total of 9590 organizations' homepages, and developed what is known as the Website Privacy Check System (4th Generation) to prevent information leakages or breaches and possible system operational errors. The MOE digitally and physically destroyed all unnecessary personal information following on-site inspections and took corrective measures against risks and unstable elements.

[Table 57] Education Organization Homepage Personal Information Leakage Statistics (Unit : numbers)

Year	Inspected Organization	No. of Organizations with Information Leaks	No. of Leak Incidents
2011	93	35	3,821
2012	136	20	10,174
2013	3,429	67	13,942
2014	9,590	61	3,277
Total	13,248	183	31,214

※ Breakdown of leaked information: personal information 64% (e.g. names, addresses, phone numbers, email addresses etc.), personal identification 36% (social security numbers, passport numbers, and driver license numbers)

Source: KERIS (August 2014)

D. Personal Information Protection Consulting

The MOE has instructed improvements at managerial levels to review institutional personal information management practices and present a safety management plan subject to management level diagnostics targeted at 636 institutions. Test results were scrutinized and 28 organizations and individuals are concerned with information disclosure for the 16 institutions relocated and consulted to promote awareness and improve possible areas of weakness.

E. Personal Information Protection Manual

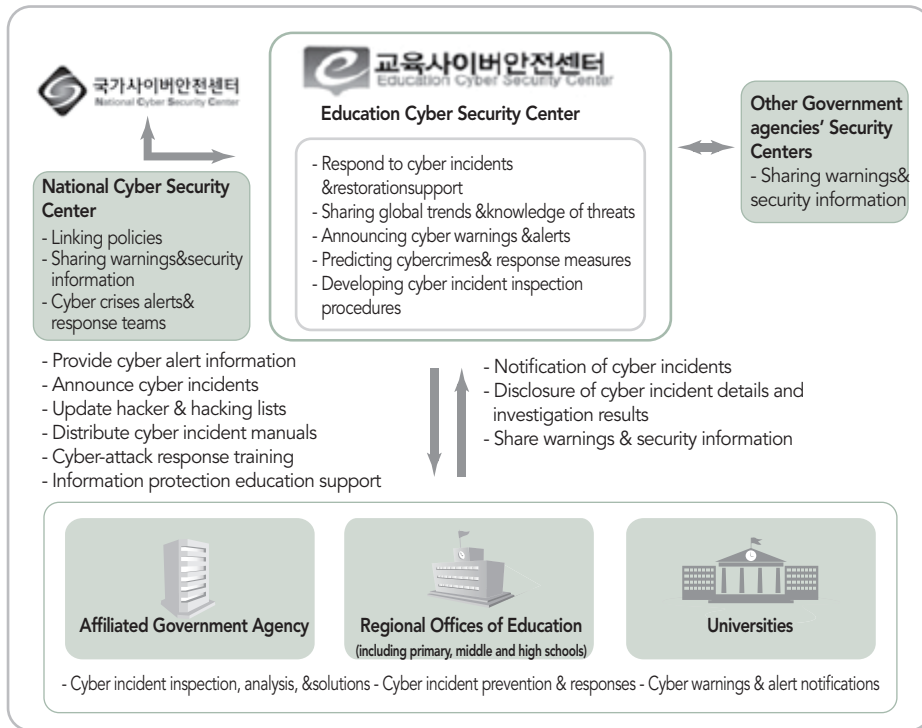
Amendment of the Privacy Act demands that personal information at existing protection service agencies be included in casebooks of the Korea National Information Society Agency (NIA), which also includes legal interpretation of Privacy Education tasked to provide basic information to other institutions.

2. Establishment and Education Cyber Security Center Operation

A. Project Overview

The MOE established the Education Cyber Security Center (hereinafter referred to as ECSC) in February 2008, in order to protect critical information resources in educational institutes from increasingly advanced cyber-attacks and help minimize any damage from such mostly malicious attacks. The ECSC has two situation rooms in Sejong City and Daegu City that monitor in real time, 24 hours a day, information and communication networks and other critical information systems.

[Figure 7] MOE Cyber Attack Response Map



[Table 58] Education Cyber Security Center Surveillance Status (September 2014) (Unit : numbers, %)

Classification		Target Organization	Control Organization	Control Rate
Regional Offices of Education		11,675	11,675	100%
Universities	Public	49	49	100%
	Private	354	265	75%
Other Affiliated Organizations		28	27	96%
Total		12,106	12,016	99%

B. 2014 Main Outcomes

1) Cyber Attack Response Security System Reinforcement

Since the cyber security center was relocated to Daegu in August 2013. A new cyber security training and dispatch center was constructed at the Sejong City government complex in 2014 in order to quickly respond to cyber-infringements related to education institutions in metropolitan areas. Funding shall be distributed to 80 institutions based on cyber threat intelligence infringement analyses, rapid response needs corresponding to threat intelligence system expansion systems (to check system vulnerabilities, malware tracking systems, etc.), and the advancement of information gathering threat analyses, and high-performance TMS software.

2) Cyber Crisis Response Drills to Build Pre-emptive Response System

In 2014, field training was performed at 74 various regional offices of education, affiliated organizations, institutions and universities. 9 institutions underwent advanced infiltration simulation training while 4 organizations conducted distributed denial-of-service aka DDoS simulation scenario training to sustain cyber crisis response abilities.

3) Information Protection Education at Education Organizations

Targeting education agency information security personnel, the MOE is running programs on information protection practices, privacy protection practices, and enhanced web vulnerability analyses.

The MOE selected Seoul Women's University, Kongju National University, Daegu University, and Mokpo University as regional IT protection institutes and centers for the gifted. IT protection institutes for the gifted will systematically select and train secondary school students who exhibit above par aptitudes in information security-related work. Such institutes' goal is to foster IT security experts with a strong sense of information ethics and morals (i.e. White Hat Hackers).

3. Establishment and Operation of Digital Signature Certification Center

A. Project Overview

The MOE established an Information Strategic Plan (ISP) in order to develop a role model for education organizations through the GPKI certification center. In 2011, due to rapid advancements in computing technology, the MOE extended the length of digital signature keys to firmly secure safety and reliability. It also acquired a 'HASH' algorithm to enhance system protection.

From February to December 2012, the MOE renewed approximately 830,000

certificates, the first national certification organization to implement system wide certification renewal. Since 2013, the MOE has been operating an enhanced digital signature certification center by strengthening real-time certificate verification processes and improving certification programs (Standard Security API).It also resolved time issues related to log-ins and ensured better compatibility with different Internet browsers.

B. Main Outcomes

1) MOE EPKI

The MOE Education Public Key Infrastructure Center(EPKIC) works to provide digital signature authentication services and a governmental education public key infrastructure (hereinafter referred to as GPKI) authentication center and allows all its affiliated organizations to process work using GPKI and EPKI.

[Table 59] MOE Digital Signature Authentication System Usage State (Monthly)

(Unit: Incidents &Persons)

Achievement	2010	2011	2012	2013	2014 (June)
Call Center	2,522	3,153	6,444	47,719	33,023
Distance Access	168	196	203	2,292	2,656
Certification System Visitors	3,296,343	669,150	797,763	5,247,684	5,666,492

2) Offices of Education, Universities and Public Organizations as RA or LRA

The user certificate issuance system was completed by designating offices of education at city and provincial levels as RA while designating their subsidiary offices of education, universities and public organizations as LRA. Please refer to Table 60 for additional information.

[Table 60] Status of MOERA&LRA (April 2014)

(Unit : Incident)

Classification	MOE	City & Provincial Offices of Education	Subsidiary Offices of Education	Universities	Public Institutes
No. of Institutes	1	17	172	531	43

3) MOE Digital Signature Certification System Backup System

The crisis recovery backup center for the digital signature authentication service is complete and operational for the purpose of ensuring work continuity. The digital signature authentication center is subject to a rigorous simulation crisis recovery exercise every 6 months centered on various scenarios that could result in system

failures and catastrophes including earthquakes, network separations or cut-offs, etc.

4) Digital Signature Certification Based Security Program

With the Privacy Act entering into effect, the MOE issued free SSL certificates to education agencies to help reduce budget burdens. In addition, the MOE enhanced security by applying a field certificate diffusion processing program, and expanding and distributing this certificate processing program to strengthen education agencies' application systems security. In addition, the digital signature certification center offers free SSL certificates, certification programs and technological support to approved education institutions.

5) Organization, Personnel and Finance

The MOE Digital Signature Certification System Center instructed information protection teams to author step-by-step manuals as they carried out their duties. Please refer to Table 61 for more information. The organizational hierarchy is further explained in Table 62. When dealing with RA and LRA projects, the MOE sought to utilize the existing workforce or individuals already associated with regional offices of education, universities and public organizations. The center's budget expenditures are listed in Table 63. The annual budget for the digital signature authentication system center was provisioned KRW 2 billion as per Presidential decree to be taken from the regional digital business support fund until 2007. As of 2009, the funding source reformed to use government subsidies and treasury grants.

[Table 61] MOE Digital Signature Certification System Center Organization

Classification	Role	Operation Period	Composition	Remarks
Introductory Phase	Create a center	Sept. 2007~ Dec. 2008	Education Cyber Security Center T/F Team Administered by KERIS	
	Issue GPKI Certification	Mar. 2006~ Mar. 2008		
Expansion Phase	Authentication System Dualization	April 2008~ Dec. 2009		
Stabilization Phase	Construct Authentication Backup Center & Cumulative Authentication Gateway	Jan. 2010~ Dec. 2011		KISTI Founding
Advancement Phase	Enhance Management System	Jan. 2012~ Dec. 2014		

[Table 62] Yearly Digital Signature Certification Center Workforce Personnel (Unit: persons)

Classification	2008	2009	2010	2011	2012	2013	2014
Official	2	3	3	3	2	2	3
Contractor	0	1	2	2	2	2	2
Consigned	6	9	9	12	12	12	12
Total	8	13	14	17	16	16	17

[Table 63] MOE Digital Signature Certification Center Budget (Unit:KRW million)

Year Classification	2007	2008	2009	2010	2011	2012	2013	2014	Total	
Establishing Information Protection ISP	30	-	-	-	-	-	-	-	30	
System	Authentication Center	2,000	-	1,728	1,227	1,350	841	629	265	8,040
	Back-up Center	-	-	-	1,500	1,300	-	-	-	2,800
Center Management (Maintenance Included)	-	200	762	762	533	845	1,341	1,434	5,877	
Total	2,030	200	2,490	3,489	3,183	1,686	1,970	1,699	16,747	

6) Restructuring Laws and Governance

The MOE Digital Signature Certification Center has set forth the Authentication Management Task Directive that prescribes authentication types, methods and procedures, requirements for the use, authentication system configuration and contents, and other necessary items to guarantee user reliability and transparency. The aforementioned directive had been issued to each relevant organization to clarify the responsibilities of administrators and users related to certificate issuance.

International Cooperation and ICT in Private Sector

Section 1. International Cooperation

1. Overview

The Korean MOE is pushing for various international cooperation projects in order for Korea, G20 Summit host country and OECD Development Assistance Committee member, to participate fully and fulfil its imperative role in relieving the global gap in education informatization.

The long list of international cooperation projects includes the ‘e-Learning Globalization Project’, ‘Advanced Classroom Project’, and ‘Solar Powered School Project’ for elementary and secondary schools and the ‘ASEAN Cyber University E-learning Project’ for higher education.

[Table 64] International Cooperation in Education Informatization Overview

Classification	Project	Project Overview		
		Business Scope	2014 Budget	Designated Institutions
Primary & Secondary Education	E-learning Globalization	Infrastructure & teacher training support to 17 countries in conjunction with city & provincial offices of education, development of international index of ICT in education indicators with international partners, & organizing global ICT symposiums, etc. (2005 onwards)	KRW 2.27 billion	KERIS, KEFA, Institute of APEC Collaborative Education
	Export Support for Advanced Korean Education Services	‘Advanced ICT Application Pilot Class’ support to developing countries (2011 onwards)	KRW 1.74 billion	KEFA & KT Corp.
	Solar Powered School	Solar School Application Education Support in partnership with Samsung Electronics & support for teacher’s ICT competence for African countries (2013 onwards)	KRW 0.1 billion	KERIS & Samsung Electronics
Higher Education	ASEAN Cyber University E-learning	Support e-Learning competence for ASEAN countries & activation of Korea-ASEAN cooperation (2012 onwards)	KRW 2.1 billion	Seoul Cyber University

2. Projects

A. E-learning Globalization Project

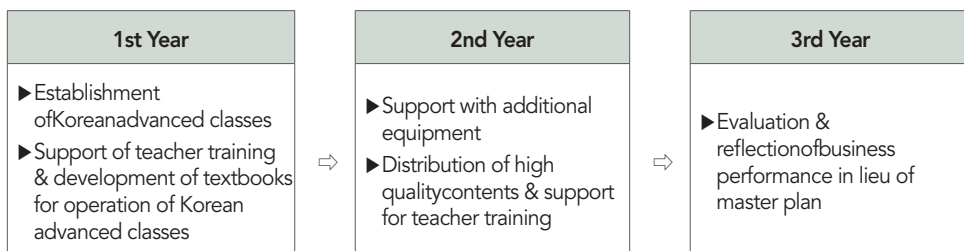
The e-Learning Globalization that began in 2006 is, by and large, composed of three sectors that include, cooperation among international organizations and multilateral e-learning programs, support with e-learning infrastructure and related technologies for target countries of strategic investment, and lastly, education informatization experiments and training support along with pertinent 8 subprojects, each of which is led by KERIS, Korea Education Frontier Association (hereinafter referred to as KEFA), and the Institute of APEC Collaborative Education, each with distinctive founding characteristics.

The cooperative international organization sector and multilateral e-learning programs include the development and application of common education informatization indices, sponsorship of the International 2014 e-Learning Korea Exhibition and Conference, and Korea-International Organizations ICT Global Symposium. For e-learning infrastructure and technology investment purposes in strategically identified countries, an e-learning international consultant development course was run and produced 469 experts leading up to 2014. During the corresponding period 24,574 e-learning infrastructure sets were supplied to 28 countries. In addition, training initiatives and contests that invited world renowned and leading teachers from exchange and cooperation partner countries involving APEC e-learning training and e-ICON international training, were also held.

B. Export Support for Advanced Korean Education Services Project

The MOE has pushed ahead with 'Export Support for Advanced Korean Education Services'. The MOE ordinarily selects 2 countries for exchange and cooperation and provides them with the comprehensive 'Advanced ICT Application Pilot Class', educational e-learning contents and needs-based teacher training courses. These are areas in Korea has accumulated a tremendously high quantity and quality informatization experience and expertise. The project, which lasts three years, has established and supported the operations of the Advanced Class in seven countries leading up to 2013. In 2014, the project was implemented in Sri Lanka and Paraguay.

[Figure 8] Overview of Export Support of Advanced Korean Education Services



C. Support for Solar Powered Internet School Project

Since 2013, a public-private partnership (PPP) model between the MOE, KERIS and Samsung Electronics was developed the ‘Solar School Application Education Support’ as one of many official development assistance projects. The aim is the provision of access to ICT education and to support teacher’s ICT competence in African countries lacking sufficient electric infrastructure yet still possess rich solar resources to make the best use of these solar powered Internet schools.

D. ASEAN Cyber University E-learning Project

Ensuing to the aforementioned projects, the MOE has additionally pushed ahead with the ASEAN Cyber University Establishment Project, serving as a pipeline of international cooperation with regards to e-learning in higher education. Due to diverse e-Learning situations prevalent around ASEAN member countries, the original plan (establishment of ASEAN Cyber University in 2015) was revised to follow the strategic phases listed in Figure 9. Therefore, the project will concentrate on mainly two themes. The first being ‘supporting e-learning competence of the four second movers identified as Cambodia, Laos, Myanmar and Vietnam (CLMV)’ and the second, ‘activating Korea-ASEAN cooperation in higher education’.

[Figure 9] Strategies of Phased Establishment of ASEAN Cyber University

Phase	Phase 1 (~2015)	Phase 2 (2016~2020)	Phase 3 (2020~)
Business Details	<ul style="list-style-type: none"> • Support CLMV e-learning competence • Activation of Korea-ASEAN cooperation in higher education 	<ul style="list-style-type: none"> • Operation of Korea-ASEAN higher education network & activation of cooperation among member countries based on e-learning 	<ul style="list-style-type: none"> • Review ASEAN Cyber University establishment based on performance

Section 2. ICT in Private Institutes

1. Overview and Progress

Since 2005, the MOE, together with city and district offices of education, pushed for international cooperation projects with 17 e-learning partner countries in areas related to policy consulting, training and infrastructure support. The MOE, since 2011, encouraged global expansion of e-learning businesses by exporting Korean Advanced Education Services. In 2014, the MOE is implementing the ‘Advanced

Education Services Project’ and ‘Expert Deployment Training Program’. It is working hand in hand with 17 city and district offices of education, KERIS and the Korea Association of Information and Telecommunication(KAIT) to expedite the globalization of e-learning.

The MOE has also established and supported operation of the Advanced ICT Application Demonstration Class beginning with Indonesia, Colombia, And Brunei in 2011. Recipient countries of the years following 2011 include Mongolia and the Philippines in 2012, Cambodia and Azerbaijan in 2013. In 2014 the project was implemented in Sri Lanka and Paraguay.

2. 2014 Main Outcomes

A. Sri Lanka

As a result of Sri Lanka’s civil war, which lasted from 1983 to 2009, national development has been stagnant and the majority of its population lives in poverty. As such, the quality of education in Sri Lanka has remained low notwithstanding the implementation of universal education. Lacking the revenue and investment necessary, Sri Lanka’s quality of education services is insufficient and inadequate to foster capable human resources vital to national growth. In response to the current situation, Sri Lanka is seeking to invest further in education by utilizing credit assistance and aid channels. For example, Sri Lanka and the Asian Development Bank are working on the ‘Competency Development Project for Human Resource Development’ (ADB Project Number: 39293).

For its efforts, Sri Lanka was chosen as a partner country for the MOE Global e-Learning Project in 2005. The Gwangju Metropolitan City Office of Education (GMCOE) signed an MOU with the Sri Lanka Ministry of Education that year. Since then, GMCOE has conducted teacher training and provided IT devices. Thanks to this kind of successful joint undertakings, Sri Lanka has maintained a close working relationship with the Republic of Korea (ROK) by participating in the MOE’s International ICT Leadership Training Program and international education informatization working groups.

B. Paraguay

Most of Paraguay’s elementary, middle and high schools are public. By law, grades 1 through 9 are mandatory and offered free of charge. General operations in education such as organizational and systematic administration are conducted by the Education Ministry in collaboration with local schools.

The MOE has already conducted a professional on-site evaluation so as to proceed with a state-of-the-art classroom construction project, and ‘Escuela Nacional de Comercio No. 1 chose Alfonso B. Campos School’ has been selected as model school for this prestigious project. Beginning with the selection of schools and construction of state-of-art classrooms, the project should receive strategic implementation follow up support to effectively utilize the classrooms and management of other educational infrastructure, as well as considerable investment in developing new curricula and contents in the future.

Section 3. Status of e-Learning Industry

1. Supply

The supply amount of e-learning is estimated to be KRW 2,947.7 billion as of 2013 with reference to e-learning turnover of all industry sectors including solutions, contents, services, and so forth. This indicates an increase of 7.3% compared to KRW 2,747.7 billion in 2012.

2. Demand

In 2013, estimations indicated that regular educational institutes, government and public CT in private sector organizations, businesses and individuals spent KRW 2,861.1 billion in total on e-learning, which shows an increase of 9.9% when compared to KRW 2,604.3 billion in 2012.

[Table 65] 2009~2013 e-Learning Market Volume

(Unit: KRW million&%)

Classification	2009	2010	2011	2012	2013	Growth Rate
Individuals	945,369	1,003,177	1,093,016	1,102,586	1,256,430	14.0
Businesses	886,283	963,139	1,075,645	1,189,963	1,284,258	7.9
Educational Institutions	96,434	106,768	127,540	136,722	144,327	5.6
Government & Public Institutions	143,806	151,255	165,315	175,062	176,126	0.6
Total	2,071,892	2,224,339	2,461,516	2,604,333	2,861,141	9.9

Source: e-Learning Market Survey, National IT Industry Promotion Agency (April 2014)

3. e-Learning Business

Tallying the number of e-learning businesses based on accrued e-learning related revenues, there were 1,649 e-learning business operators in 2013. This points to a 35

company increase from the previous year. The statistics show a slight improvement from 2012 but the overall number of operators has remained constant over the past three years.

4. e-Learning Personnel

In 2013 there were 25,843 people employed in the e-Learning sector, which shows an increase of 886 people up from 24,957 in 2012. Companies with total sales less than KRW 100 million per annum (accounting for more than half of the total number of e-learning business) have on average 2.9 workers, totaling 2,372 workers, and account for 9.2% of the total workforce in the e-learning sector.

5. e-Learning Research and Development

With world-leading e-learning technology and service standards judged using a 100 point scale, the Republic of Korea's e-learning technology and services attained an overall score of 76.7, having scored 74.0 points in the contents category, 76.6 in solutions and 79.3 in services respectively.

One revelation was that 82.4% of all e-learning contents are originally developed. In particular, PCs have been proven to be the most popular targeted devices. In developing e-learning content, video formats result in KRW 12.35 million in costs, with an average production period of 4.5 months. In contrast, WBI and e-book formats tend to cost less and can be produced much faster.

6. Intellectual Property

According to a survey conducted by the National IT Industry Promotion Agency, businesses in legal possession of one or more patent rights, utility models, trademarks, design and/or copyrights, account for 16.8%, indicating an increase of 3.0% up from 13.8% in 2012.

[Table 66] E-learning Intellectual Property Retention Rate and Spending Cost (Unit : %)

Classification	2011		2012		2013		
	Retention rate	Non-retention rate	Retention rate	Non-retention rate	Retention rate	Non-retention rate	Costs vs. Revenues
Contents	28.4	71.6	21.7	78.3	17.5	82.5	2.7
Solution	21.8	78.2	18.5	81.5	33.6	66.4	1.4
Service	23.7	76.3	10.2	89.8	13.5	86.5	2.3
Total	24.5	75.5	13.8	86.2	16.8	83.2	2.3

Source: e-Learning Business Survey, National IT Industry Promotion Agency (April 2014)

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Summary

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