Best Practice of ICT in Education with Special Focus on Korean Case

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I. Overview
High demands and drive for education, and Korean’s characteristic known as early adapters are the backbone of the economy as well as of sustainable nation’s growth.

Public recognition of global competency of Korean education system has been much lower than compared to citizen’s expectation.

Innovation of education and teacher training has been attributed to holistic approaches leveraging ICT in education: curriculum design, teacher training, cooperation between private and public.

Pay attentions to open access movement for quality education: OCW, OER, and clearance of IPR.

Diversify cloud computing, clearance of IPR, and use of emerging technologies.

Emerge the flexible learning framework for formal and non-formal education.

Redesign education/learning system for “Generation Y”.

Outcome and evidence are the key parts of policy making and performance evaluation.
Analysis of ICT in Education and Training

- Formal education
  - Primary and secondary education
    - Bridge education divide between rural and urban areas
    - Provide students with learning opportunity: CHLS
    - Educate “Generation Y” for the 21st century: u-School, Smart education
    - Nation e-Administration and e-Financing: NEIS, EDUFINE
  - Establish education information sharing environment: digital library, EDUNET,
- Higher education
  - Global competence and open access: Global Virtual Lab., KOCW,
  - Pedagogy innovation: Regional e-Learning Support Center, mobile campus
  - More opportunity for HE and life long education: Cyber university, Credit banking system
  - Establish research information sharing system: RISS4U
- Training for Human Resource Development
  - Teacher training: e-Teacher training system
  - Government official training: Government Officer Training Center
  - Company employee training: Job training institutes
Social Changes Driven by Technology

- Globalization
- Complexity
- Technology Convergence
- Integration of Services

Smart Era

- Fusion Age
- Nano-Bio Age
- Information Age

Agrarian Age 6000~7000 years
Industrial Age 250 years

Present

What Smart Society Looks like

Source: NCA, SKI presentation material, Jan. 2011, Reformulated by Dae Joon Hwang

- **Techno-technology**: Physical strength, diligence
  - Self supplied, physical strength
  - Overcome natural disasters
  - Diligent farmer
  - Community culture

- **Work paradigm**: Industry technology
  - Mass production, labor intensive
  - H/W oriented
  - Diligent employee
  - Closed, bureaucratic

- **Management strategy**: Knowledge, information
  - Knowledge intensive, horizontal
  - S/W oriented

- **Virtue**: Knowledge workers
  - Knowledge, sharing, openness

- **Core value**: Mobile communication, Cloud computing, Open access, Smart technology
  - Smart innovation, Over-connected
  - Convergence, Mobile innovative venture, 1-person company
  - Creative and global citizenship
  - Flexibility, creativity, and human value centered

※ Source: NCA, SKI presentation material, Jan. 2011, Reformulated by Dae Joon Hwang
What Drives Changes

- “Generation Y”
- Parallel process
- Tech savvy
- Teamwork
- Outcome oriented

Demography

- Open networking
- Global competence
- Open access movement: OER, OCW
- New responsibility
- Hub of knowledge ecosystem

Technology

- Mobile communication technology
- Cloud computing
- Web technology
- Smart media and device technology

Globalization

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“Generation Y”, Who They Are?

- Born between 1977 and 1997
- The generation of “web 2.0”
- Parallel process
- Just in time learner
- Tech savvy
  - Continually connected with IM, SMS
  - Socially connected with devices
  - Random access to interactive media
- Cosmopolitan
  - Influenced by peers
- Short attention span
  - Skim text and information quickly
  - Instant access
- Achievement oriented
  - Seek recognition, fame and feedback
  - Wants meaningful work and a solid learning curve
  - Learning is fun and relevant
- Teamwork
  - Value teamwork and seek the input and affirmation of others
  - Loyal, committed and wants to be included and involved
• Train the competency for faculty and administration staffs to learn how to leverage emerging technology and diverse educational resources for better quality and more outcomes to bring.
Global Open Access Movement

- **OER in the globe**
  - MERLOT (USA)
  - ARIADNE (EU)
  - Education.au limited-EdNA online (Australia)
  - LORNET (Canada)
  - EduCommons
  - European Schoolnet
  - LACRO (Latin-American Community of Learning Objects)
  - NIME-glad (Japan) → GLOSS (Open Univ. of Japan)

- **Practices**
  - iTunes Univ.: Less text, more video and animated materials
  - OPAL: Open Educational Practice
  - OLnet – international research community on OER

- **Open Course Ware**
  - MIT OCW initiative in 2003
  - OCW Consortia founded (Global Consortium now with +250 member universities from +45 countries)
  - China: CORE Consortium
  - Japan: JOCW Consortium
  - Korea: KOCW Consortium
  - Spain: OCW Universia
  - France: Paris Tech OCW project
  - African virtual university

- **Other Projects**
  - UK: Open Univ
  - Australia: AEShare Net
  - Europe: MORIL
Creative Common License Movement

- Promote sharing creations and creative works based on some rights of creators reversed

![Creative Commons Licenses](https://i.imgur.com/3Q5Q5Q5.png)
Cloud Computing: What is SaaS?

Software as a Service

From Wikipedia, the free encyclopedia

Software as a Service (SaaS) is a model of software delivery where the software company provides maintenance, daily technical operation, and support for the software provided to their client. SaaS is a model of software delivery rather than a market segment; software can be delivered using this method to any market segment including home consumers, small business, medium and large business.

Contents

1 Key characteristics of software delivered by SaaS
2 Types of SaaS Providers
3 ASP versus SaaS
4 SaaS providers
5 See also

Key characteristics of software delivered by SaaS

The key characteristics of SaaS software, according to IDC[citation needed], include:

- network-based access to, and management of, commercially available (i.e., not custom) software
- activities that are managed from central locations rather than at each customer's site, enabling customers to access applications remotely via the Web
- application delivery that typically is closer to a one-to-many model (single instance, multitenant architecture) than to a one-to-one model, including architecture, pricing, partnering, and management characteristics

Types of SaaS Providers
What a Common Message?

- Rapid response
- Redesign goal and context of organization and institutions
- Create new opportunity
II Initiatives of ICT in Education
Backgrounds of ICT in Education

De-synchronization

Globalization (competitiveness)

Challenge to paradigm shift in education

Leveraging ICT technologies

Education Innovation for Global Competitiveness

ICT in education as a catalyst for education innovation
Directions of ICT in Education

- Classroom renovation
- Extend spaces for education and learning
- Quality education for global competence
- Smart innovation emerged as a new paradigm shift
# The Master Plans of ICT in Education

<table>
<thead>
<tr>
<th>Master plans</th>
<th>Goal</th>
<th>ICT Development</th>
<th>Teacher Training Policies</th>
<th>Goals for Teacher Training</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MP 1: ICT literacy</strong></td>
<td>Establish ICT infrastructure</td>
<td>1996-2000</td>
<td>Teacher training for over 25% of all teachers annually</td>
<td>Focus on ICT literacy</td>
</tr>
<tr>
<td><strong>MP 2: Promotion and stabilization of ICT use in Education</strong></td>
<td>Promotion of use of ICT in education</td>
<td>2001-2005</td>
<td>Teacher training for over 33% of all teachers annually</td>
<td></td>
</tr>
<tr>
<td><strong>PM 3: Advances ICT use in education</strong></td>
<td>Advances in Education and Research Information service</td>
<td>2006-2010</td>
<td>Teacher training for use of ICT in education: 30 hrs (15 hrs, optional) for every 3 years</td>
<td></td>
</tr>
<tr>
<td><strong>MP 4: Creative education by Leveraging digital technologies</strong></td>
<td>Smart Innovation in Education/Learning</td>
<td>2011-2015</td>
<td></td>
<td>Smart innovation in education for creativity, quality, and global competence</td>
</tr>
</tbody>
</table>

### 1996-2000
- Infrastructure building
- ICT literacy education
- Internet portal service
- Opening of EDUNET

### 2001-2005
- Development and distribution of content
- National system for sharing educational contents
- Digital Library System
- Improving teaching methods
- EDUNET Teaching/Learning center
- Cyber Home Learning System
- EBS lectures for college academic ability test

### 2006-2010
- Customized learning
- Develop digital textbooks
- U-Learning pilot projects
- National Teacher Training Information Service
- Restructuring EDUNET based on Web 2.0
- Develop Edu-fine
- Establish KOCW
- Education Cyber Security Center
- Global consulting on e-Learning
- Penetrate into foreign Knowledge business market

### 2011-2015
- Outcomes and evidence based policy making
- Emphasis on creativity and critical thinking in education
- Create digital ecosystem for learning and research
- Leverage ICT for education innovation
- Pay attentions to side effects of ICT
- Nurture competency of teachers
- Encourage stake holder’s participation and networking

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Summary of ICT Initiatives in Education

Master Plan IV
- EDUNET: National Teaching-learning center
- NEIS: National Education Information System
- CHLS: Cyber Home Learning System
- KMEC: Korea Multimedia Education Center
- KERIS: Korea Education & Research Information Service

Master Plan III

Master Plan II

Master Plan I

Initiate

1996
- Computer education in schools
- CAI content

2001
- School Administrative System
- Teacher training
- Computer subject
- Internet connection completed
- Education Resources Sharing System

2006
- Regional center for ICT in education
- Education Cyber Security Center

2010
- Smart education Information Ethics, smart citizen Education

PCs, H/W
- National bureau
- KMEC

Digital Textbook
- E-Teacher Training
- Enhanced teacher training
- Self-directed learning content
- Teaching learning model
- E-Learning infra.

u-Learning infra.
- Multimedia content
- u-Learning model school
- NEIS
- Innovative teacher
- Metadata standard

u-Learning model
- School network
- KERIS
- Regional bureau
- Metadata standard
- CHLS
- Internet connection completed

NEIS
- KMEC
- Regional bureau
- Internet connection completed

Innovative teacher
- EDUNET
- Teacher training
- Computer subject
- Internet connection completed

Multimedia content
- CAI content
- School network
- National bureau
- P-P-P

Self-directed learning content

EduFine
- CHLS
- Enhanced teacher training
- Teaching learning model
- EDUNET

Smart education
- Information Ethics, smart citizen Education

Education information service
- Capacity building for teacher
- ICT in education standardization & Educational content
- Infrastructure
- ICT in education policy
**Outcomes of ICT in Primary and Secondary Education**

- **EDUNET**
  - **S:** use an integrated education information portal
  - **T:** save time for subject preparation (53<-71m), promote community activity, share hand on experience
  - **P:** allowed participation to school affairs and ICT literacy training
  - 6.35M registered

- **CHLS**
- **ECSC**
- **NEIS**
- **NTTIS**

- **S,T, Institutions:** establish secure environment for information use, promote ethics of information use and internet ethics of cyber space

- **ECSC**
- **EDUNET**
- **NEIS**
- **NTTIS**

- **S:** provide learning opportunity after schools and equality for education, diminish education gab between rural area and urban area, change their behavior toward positive way
- **T:** new role for facilitator, life long learner, encourage innovate pedagogy
- **P:** invited to tutoring opportunities

- **T:** help to manage their career and design personalized training program, share experiences in handling issues and problems relevant to training with peers, get personalized consulting service for capacity building

- **Infrastructure**

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Outcomes of ICT in Higher Education

Education

- **Students**
  - Provide students with more opportunity to access education programs developed by other universities, OER, and OCW
  - Motivate to evaluate quality of education from student’s perspective
  - Encourage to participate activities for education and learning

- **Instructors**
  - Open instructions to the Internet: e-Learning
  - Motivate evaluation on lecture and learning by peer and students: Lecture evaluation by peer and students
  - Collaboration became popular in research and lecture: Regional e-Learning Support Center, National Liberal Arts Research Center
  - Encourage to participate open access to educational resources: KOCW
  - Pay more attentions to student centered education

- **University**
  - Experience in inter university collaboration
  - More open to share educational resources
  - Emphasize outcomes and student’s satisfaction in performance evaluation
  - Voices up to government for more financial support for HE

- **Government**
  - Find optimal way to implement ICT in education
  - Recognize the importance of coordination, initiatives for promotion of ICT in education
  - Put high value on ICT for innovating education system
Goals of adoption of ICT in education

Establish mater plan

Stable funding

Holistic approaches: infrastructure, organization, legal foundation, government leadership and initiatives, and coordination

Implementation strategy: cloud computing, open source SW, open educational resources, IPR

Encourage and coordination participation: teachers, students, parents, private, public, and government

Nurturing competence: teachers & school CEOs, educational administrators, and students

Performance management: monitoring, evaluation of outcomes, quality control
Goals of ICT in Education

- Education welfare
- Global competence of Education
- Quality Education
- Equality in education and participation
### Stable Funding for ICT in Education

<table>
<thead>
<tr>
<th>Period</th>
<th>Budget</th>
<th>Implementation Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘87~’95</td>
<td></td>
<td>- Small change from national public telephone company (KT): total 64 mil. USD&lt;br&gt;- Collaboration with national agency to reduce supply cost: Public Procurement Service</td>
</tr>
<tr>
<td>(Beginning Stage)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>‘96~’00</td>
<td>1,406 M USD</td>
<td>- Edu-Rate: Reduce Internet communication expense through collaboration with KT&lt;br&gt;- Tax benefit for private sector&lt;br&gt;- Collaboration with private IT training center to provide PC labs and instructors for public schools</td>
</tr>
<tr>
<td>Master Plan I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>‘01~’05</td>
<td>1.596 M USD</td>
<td>- Establish national IT Fund</td>
</tr>
<tr>
<td>Master Plan II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>‘06~Present</td>
<td>269 M. USD (2006)</td>
<td>- Autonomy to regional government&lt;br&gt;- Intergovernmental collaboration&lt;br&gt;- Public-private partnership</td>
</tr>
<tr>
<td>Master Plan III</td>
<td></td>
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</tr>
</tbody>
</table>
Holistic Approaches to Promote ICT in Education

Education Innovation using ICT

- Korean’s high drive for education
- Curriculum redesign & Perform management
- Teacher capacity building
- Government leadership
- Foundations: Laws, Acts, Presidential decrees
- Role play among MEST, KERIS, and MPOE
- Coordination of issues among private, public, and schools
- Well established ICT Infrastructure
- Standards: KEM, SCORM, Education Information Sharing Environment

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Coordination in Promotion of e-Learning

- Approved e-Learning in HE, cyber universities, and Primary and secondary education
- Certify the quality of e-Learning programs
- Develop de facto standards

Ministry of Education, Science & Technology
- Operation of e-training system for government officials and the public service

Ministry of Labor
- Support job training by e-Learning
- Unemployment insurance refunds for e-Training courses

Ministry of Public Administration & Security

Ministry of Knowledge Economy
- Promote e-Learning industry
- Developing technology and de jure standards
- Certify the quality of e-Learning product

Ministry of Culture, Sports & Tourism
- Developing e-Learning content for promotion of multiculturalism and home with different culture

Structure of Legal Foundations of e-Learning

- Life Long Education Law
- Protection Law of Intellectual Property Right
- eLearning Industry Promotion Law
- Protection Law of Privacy Right
- Act of promotion of Government officials training
- QA guidelines
- Establishment guidelines
- Presidential Decree No. 20942
- Primary and Secondary Education Law
- Act of Promotion of Job Training

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Education Information Service Framework

EDUNET
Teacher, Student, Parent
(web 2.0-based, individualized, user homepage)

Integrated certification system/copyright management system

- NEIS
- Center for Teaching & Learning
- Cyber Home Learning
- Digital Library
- Digital Textbook

User Layer
Service Layer
Resource Layer

Nationwide center for integrated educational information service

Central Teaching and Learning Center
Central Cyber Home Learning Center
Central DLS Center
Education Cyber Security Center

Educational information data (applied KEM/DRM), various unit service modules (assessment tools, online discussion tools, etc)
※ Ensure interoperability through compliance with the W3C web standard and adoption of IMS Common Cartridge
• Integration of educational resources

• Quality content service

Knowledge Warehouse

• Teachers
  - Teachers
  - Head teachers
  - Librarians

• Students
  - K12
  - College
  - Special

• Parents
  - Children Edu.
  - Life-long Edu.

• Administrators
  - Principle
  - Supervisor
  - Policy makers

Integrated search

Collaboration

Community

• Facilitate information sharing of all stakeholders

• Facilitate cooperative learning (class to class, school to school)

- Number of registered users: 6.14 million (100% of school teachers registered)
- Number of daily users: 390,000
- Number of education information and content: 1.06 million
- Number of Question and Tests Items: 193,600
National e-Administration System

National Education Information System (NEIS)

MEST
- Statistics DB
- Admin DB
- Index DB

MPOEs
- Civil Service Support DB
- Education Admin DB

Security · Certification

MEST

MPOEs

Local Offices of Education

Citizens

Schools

“Digital Textbook” Project

Connection to national knowledge DB

Handbook / Exercise book

Data Searching

Dictionary

Multi-media

Hyperlink

Textbook

Learning Management System

Authoring Tool

Evaluation Tool

Connection of contents owned by political / economical / social / cultural institutions

* Source: KERIS, Digital Textbook, 2009
Summary of e-Learning in Korea

- Adoption of e-Learning in education institutions in 2009: 76.8%
  - Primary (83.5%), Secondary(76.6%), High(67.8%), Junior High(45.1%)
  - HE: Junior college(57.6%), 4Yr University(77.5%), Cyber University(100%)
- Strategy of HRD
  - Government official training: 517,000 in 2009
  - Job training: 2.05 Million employees in 2009
  - Teacher training: 226,313 teachers in 2009
- e-Learning became a major knowledge business: Demand and supply market in revenue USD 2.07B, USD 2.09B respectively in 2009
- Legal foundations: Primary and secondary education law, HE law, LLE law, Presidential decrees, IPR protection law, Privacy protection law, e-Learning industry promotion law, e-Training in labor education Law
- e-Learning quality management
  - Establishment guidelines: Cyber university, e-Learning institutes
  - QA guidelines: CHLS, Teacher Training Institutes, Cyber university, e-Learning institutes, e-Learning products
  - Certification guidelines of content and SW for education and training
## Analysis of Individual e-Learners in Korea

### Gender

<table>
<thead>
<tr>
<th>Age Group</th>
<th>2007(%)</th>
<th>2008(%)</th>
<th>2009(%)</th>
<th>Growth Ratio(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>45.8</td>
<td>47.6</td>
<td>50.4</td>
<td>2.8</td>
</tr>
<tr>
<td>Female</td>
<td>31.5</td>
<td>41.9</td>
<td>46.1</td>
<td>4.2</td>
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</table>

### Age Group

<table>
<thead>
<tr>
<th>Age Group</th>
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<th>2008(%)</th>
<th>2009(%)</th>
<th>Growth Ratio(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-19</td>
<td>67.0</td>
<td>70.9</td>
<td>72.0</td>
<td>1.1</td>
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<tr>
<td>20-29</td>
<td>50.7</td>
<td>61.3</td>
<td>62.6</td>
<td>1.3</td>
</tr>
<tr>
<td>30-39</td>
<td>27.2</td>
<td>30.5</td>
<td>40.8</td>
<td>10.3</td>
</tr>
<tr>
<td>40-49</td>
<td>23.4</td>
<td>29.6</td>
<td>31.7</td>
<td>2.1</td>
</tr>
<tr>
<td>More than 50</td>
<td>11.2</td>
<td>13.5</td>
<td>18.4</td>
<td>4.9</td>
</tr>
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</table>

### Educational Background

<table>
<thead>
<tr>
<th>Background</th>
<th>2007(%)</th>
<th>2008(%)</th>
<th>2009(%)</th>
<th>Growth Ratio(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre/Primary school</td>
<td>61.3</td>
<td>70.3</td>
<td>62.7</td>
<td>-7.6</td>
</tr>
<tr>
<td>Middle school</td>
<td>65.6</td>
<td>64.5</td>
<td>84.2</td>
<td>19.7</td>
</tr>
<tr>
<td>High schools</td>
<td>77.4</td>
<td>81.2</td>
<td>90.5</td>
<td>9.3</td>
</tr>
<tr>
<td>University Graduate School</td>
<td>69.5</td>
<td>69.3</td>
<td>70.2</td>
<td>0.9</td>
</tr>
</tbody>
</table>

### Vocational Background

<table>
<thead>
<tr>
<th>Background</th>
<th>2007(%)</th>
<th>2008(%)</th>
<th>2009(%)</th>
<th>Growth Ratio(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td>66.8</td>
<td>70.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional Clerical</td>
<td>43.5</td>
<td>48.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service/Production</td>
<td>16.1</td>
<td>22.4</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Homemaker</td>
<td>10.0</td>
<td>10.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jobless</td>
<td>21.1</td>
<td>26.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Allow students to have equal opportunity for learning
  - Provide students with seamless learning environment
- Reduce private tutoring expenses
- Enhance quality of public education

- Student-centered
- Blending of learning and education
- Curriculum-based
- Supplementary
• More interested in learning : 32.5%
• Enhanced self-motivated studying habits : 25.3 %
• Confidence gained in problem solving : 20.7 %
• Overall improvement in grades in the subject : 20.1 %
Teacher training programs designed for ICT literacy, ICT use, and ICT leadership

Operation of teacher training institutes (175)
- Government run TTIs (4), University attached TTIs (84), MPOE run TTIs (16), e-Teacher Training Institutes (71)

Number of teacher trained in 2009: 226,313 teachers
- e-Teacher training Institutes (37%), MPOE run TTIs (29%), Government run TTIs (27%), University attached TTIs (7%)

Scope of teacher training: in-, and pre-service, capacity

Types of teacher training
- e-Learning: 55.1%,
- Blended: 29.1%
- Offline: 14.6%

Overall satisfaction on e-Teacher training is high: 82.61%
Training Information

- MPOEs
- Private companies
- Universities

Self-diagnosis and Prescriptions

By position and rank
- Professional competence
- Common competence

Comprehensive Training Information System

- Training Application
- Linked analysis of training info & diagnosis results
- Taking Training Courses
  - Attendance
  - Distance
- Training Path & Quality Assurance
  - Individual training path
  - Quality assurance
  - Training course
  - Training institutes
- National Training Statistics Management

Training Outcome Analysis

- Field Test
- Outcome Evaluation
- Course Feedback

Expert Consulting

Consulting on:
- Professional competence
- Common competence
- Class lessons
- Student guidance

National Education Information System (NEIS)
Support System for Responses to Incidents of Infringement

**Unit Organization**
- MEST
- Sub-Organization
- Integrated Security Management System
- Security Data Management System
- CERT of Education Office
- S&T SEC

**External Organizations**
- National Cyber Security Center
- International CERT
- KISA (KR CERT)

**Support System Components**
- Comprehensive Analysis System
  - Detect and Responding to infringements and
  - Issue predictions and warnings
- Threat Management System
  - Analyze threats and establishing the protective measures
- Security Information Management System
  - Collect CERT data and logs of sub-organizations
- Cyber Safety Support System
  - ECSC website
  - Accident report and responses

**Direct Security Control**

**Incident Response and Issuance of Warnings**

**Collect CERT data and logs of sub-organizations**
### Indicators developed to assess the utilization of ICT in education

<table>
<thead>
<tr>
<th>Index</th>
<th>Main contents</th>
<th>Target</th>
</tr>
</thead>
</table>
| ICT literacy assessment tools for students      | **Focus**: Assessing the ability to resolve the given problematic situation effectively  
**Utilization**: Apply to the revision of the information education system  
**Domain**  
- Content domain: Computers networks and, Expression and logic of Information, Algorism and modeling, Information society and ethics  
- Ability: define, Access, Evaluate, Create, Manage, Communicate  | Primary school students (1-2, 3-4, 5-6 grade), Secondary school students (middle school and high school students) |
| ICT Skill Standard for Teacher (ISST)          | **Focus**: Assessment of ICT skill depend on role of teachers  
**Utilization**: Use in the teacher training courses  
**Domain**: Information gathering, Information processing, Information exchange, Information ethics |

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Lessons and Future Challenges
Lessons from Korean Practices

- Holistic approaches are vital to promote ICT in education
- Leadership to coordinate issues among universities, ministries, and private-public are strongly recommended
- Performance evaluation must be based on outcomes and evidence
- Diversify resource securing strategy: cloud computing, OER, OCW, purchase
- Leveraging the benefits from digital learning technologies to innovate offline education system
- Design rewarding system for motivation of teachers
- Challenge to new pedagogy for “Generation Y”
- International open standards for learning tool interoperability
- More attentions to human, emotion, and culture must be paid to design of new QAS 2.0
• Strategy for securing resources
  – Open access to educational resources: OER, OCW, OSS, and best practices
  – Cloud computing: SaaS
• Content
  – Develop quality content
  – Contents packing: One Source Multiple Platform
• Competency of HRD
  – Faculty
  – Administration staffs
• Quality assurance
  – Outcome and evidence based
  – Student centered education
• Pedagogy
  – Digital pedagogy for “Generation Y”
  – From how to teach to how to encourage to learn
• Technology
  – Diversification of learning platforms
  – Access technologies
  – Technology interoperability
  – One Source Multiple Platforms
• Innovation in organizations
  – Nurturing human resources: faculty, tutors, and administration staffs
  – Develop incentive system
  – Establish performance management system
  – Set up QA guidelines
• Multicultural understanding
  – Localization support
  – Understanding cultural differences
A Context of Smart Innovation in Education/Learning

Classroom Level

Input constructs
- Instructional modes
- Student factors
- Learning activities

Processing
- Performance management
- Change Management

Output constructs
- Learning outcomes
- Student perceived outcomes
- Learning skills

Smart Innovation in education
How to Relate Student Learning Outcomes

- Relates student-perceptions of different instructional modes to resultant student-perceived factors

What to Educate and Learn?

The 4 pillars of education by J. Delors, 1996

- Learning to know
- Learning to do
- Learning to live together
- Learning to be

New, 2011

- Communication skills
- Critical thinking
- Analytical reasoning
- Problem solving
- Cooperation and collaboration
- Emotion
- Sensitivity
- Multicultural understanding
- Intellectual flexibility
- Interpersonal skills
- Global citizenship
- Contextual dimension

* OECD AHELO: Assessment of Higher Education Learning Outcomes

Generic skills

Discipline specific skills (Economics, Engineering)

Contextual dimension

Classroom Level
Innovation in Pedagogy

Classroom Level

- Focused on creativity and creative thinking
- New pedagogy: time and space centric, mobile, personalized
- Collaborative Education/Learning
- Personalized learning: student’s level and preference
- Adopt learning design
- Content packaging: coarse-grained (SCORM), fine-grained (IMS CC)
- Sharing and reusability: One source multiple platform
- Rich multimedia and technology: 3D, Second Life, VR, AR, and simulation technologies
What to know
- Student’s behavior
- Pedagogy
- Technology
- Outcomes

What to teach
- Generic skills
- Discipline specific skills: economy, chemical engineering

How to teach or learn
- Instruction modes: instructor led, PBL
- Learning technologies: self-paced learning, collaborative learning, social learning, adaptive learning

Pedagogy for the “Generation Y”
- Just in time learner not just in case learner
- Parallel processor
- Multi-tasker
- Technology savvy

Content
- One Source Multiple Users
- Packaging format: CC, SCORM
Support various learning platforms running on diverse devices

- Diversification of learning platform: smart phones, tablet PC, Tabs
- Integration of learning services: Mobile devices + IPTV + Computer -> N Screen
Transformation of Future School

Establish an on-line evaluation system
Strengthen teachers’ competency

Motivated (Expansion of education methods)

Institutionalize on-line classes
Cloud-based school infrastructure

Self-directed (Expansion of time)

Just in Time

Any time

Use digital textbooks
Encourage on-line classes
On-line evaluation

Adaptive (Expansion of education capacity)

Collaborative learning
Experiential learning
Communication skills

Lectures

Customized education

Individualized education

3R Education

Traditional textbooks

Creative

Problem solving skills
With plenty of study materials

Resource Enriched (Expansion of educational content)

Cloud-based school infrastructure
On-line classes

Home On-the-go

Global Local communities

Technology embedded (Expansion of space)

Paradigm shift from traditional education to smart education

*Source: Se-Yeoung Chun, Smart Education for 21st Century, e-Learning Week 2011, Seoul, Korea*
Policy issues

- Policy planning: data-based -> evidence and outcome-based
- Diversifying resource securing strategy: OER, OCW, Cloud, Smart sourcing of information service and technologies, Intellectual Property Right
- Stable funding: buying & own, use based -> smart and dynamic use of education resources
- Digital divides: from ICT literacy to Media literacy

Pay more attention to the lessons and implications of Korean practices of ICT in education

Creativity, critical thinking, and collaboration are the key words for future education/learning

Adopt Establish common framework to promote sharing service and contents

Concern more about in- and non-formal learning to challenge smart society

Flexibility in teacher capacity training to challenge new demands from students and society: offline, online, blended, self-directed

International standards get importance for sharing and interoperability

Performance management: competence and changes in human factors
Thank you

감사합니다

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