Leading the Future Education, The current status of Digital Textbook in Korea

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Themes

- **Background of Digital Textbook**

- **History of The Digital Textbook Project**

- **Status of The Digital Textbook Project**

- **Cases of Digital Textbook Uses**
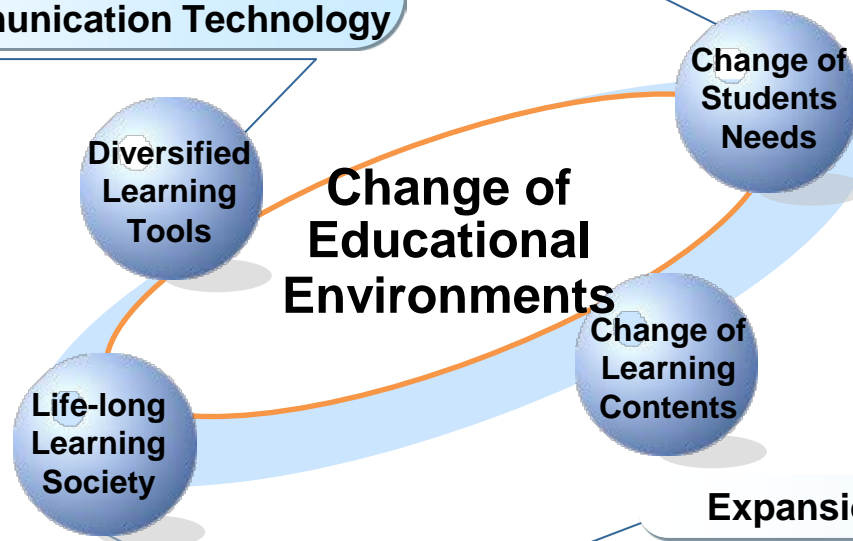
- **Effects of Digital Textbook**

- **Issues and Challenges**

Background of Digital Textbook

- **Rising needs for self-directed learning**
- **Expanding needs for diversified learning data**
- **Increase in active information sharing through communities**

- **Evolution of smart terminal & N/W (WIFI, LTE) Technology**
- **Advent & Application of New Cloud & Big Data Technology**
- **...ents**

Extension of Active Participation Learning of Students

Rapid Development of Information & Communication Technology

Diversified Learning Tools

Change of Students Needs

Change of Educational Environments

Life-long Learning Society

Change of Learning Contents

Changing Needs for Social Education

Expansion of Customized Education

- **Change to society combining work and learning**
- **Rising needs for life-long learning**
- **Needing practical education connecting communities and industries**
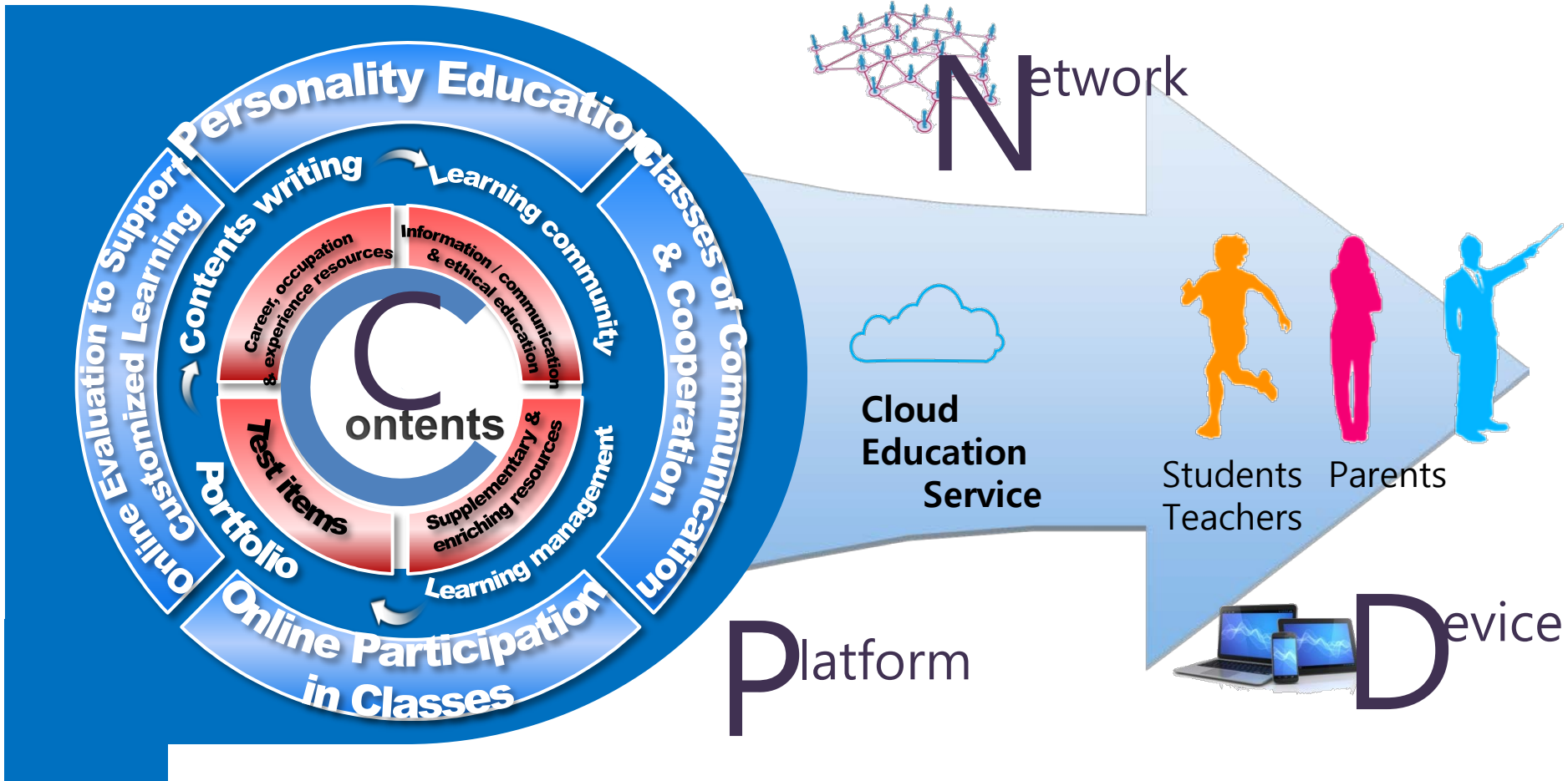- **Formal learning (20%) + Informal learning (80%)**

- **Change of focus: Memory–>Record->Use**
- **Need for diverse consulting to support individual learning**
- **Demand for developing integrated curricula meeting social needs**
- **Rising needs for adult learning combining job and life**

Background of Digital Textbook

Optimizing Education eco- system for Nurturing Creative Global HR

Network

Contents

Personality Education

Contents writing

Learning community

Career, occupation & experience resources

Information / communication & ethical education

Online Evaluation to Support Customized Learning

Test items

Supplementary & enriching resources

Portfolio

Learning management

Online Participation in Classes

Classes of Communication & Cooperation

Cloud Education Service

Platform

Students Teachers

Parents

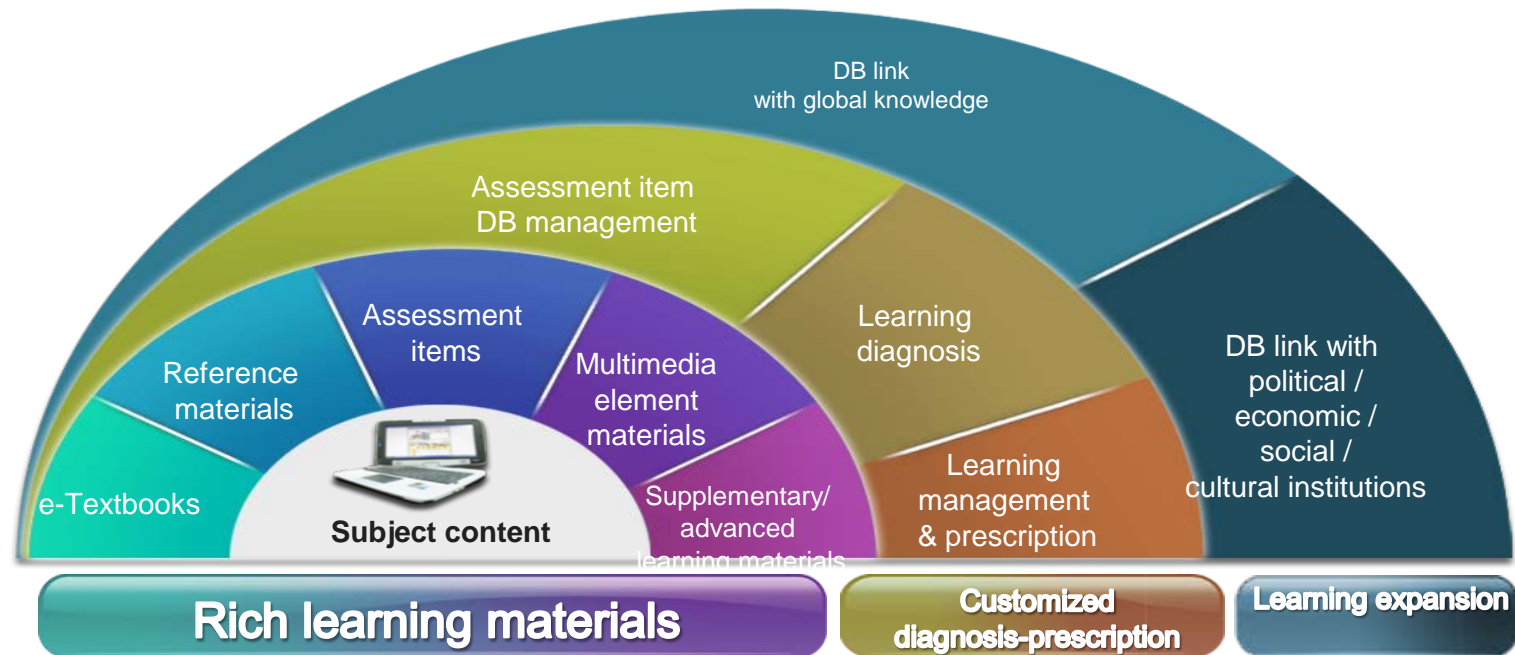**D**evice

Teacher's Capabilities

Participation of Private Sectors

Support of Parents & Communities

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Concept of Digital Textbook

What is the digital textbook?

Digital textbook refers to teaching-learning resources which contain various types of latest information, provides support tools for learners' expressive activities and learning assessment resources, and enables learning diagnosis and prescription.

DB link with global knowledge

Assessment item DB management

Learning diagnosis

DB link with political / economic / social / cultural institutions

Reference materials

Assessment items

Multimedia element materials

Learning management & prescription

e-Textbooks

Subject content

Supplementary/ advanced learning materials

Rich learning materials

Customized diagnosis-prescription

Learning expansion

- No needs for reference books and workbooks
- Management suited for individual levels
- Learning textbook perfect for self-directed learning

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History of DT Project

Stage Ⅰ (2002~2006)

- Defined the future form of textbook
- Researched on future education, environments, textbook

Stage Ⅱ (2007~2010)

- Announced digital textbook commercialization strategy(2007, MOE)
- Developed & applied prototypes to pilot schools
    * 20 schools ('08) → 112 schools('09) → 132 schools ('10) → 63 schools ('11)
- Collected empirical data for study results
  * 20 policy researches such as analysis of effects of digital textbook, development of teaching & learning methods, etc.

Stage Ⅲ (2011~ Present)

- Announced strategy for smart education implementation (2011, National Information Strategy Council of MOE
- Developed & supplied digital textbook for integrated education system
- Set up regulations for publishing digital textbook

Expansive Application by Stage

~2012

System Amendment

- Established regulations on DT
- Set up development procedures, compilation & review standards, technical specifications, production guidelines
- Adopted ISP (Information Strategy Plan)

2013

Introducing DT

- Developed DTs (for middle school and 3rd & 4th graders of social studies & science)
- Operated & supported 144 model schools
- Trained leading teachers & professional lecturers
- Implemented teacher trainings
- Supported DT researches by subject and model application
- Set up 1st DT use platform & operated a model at schools
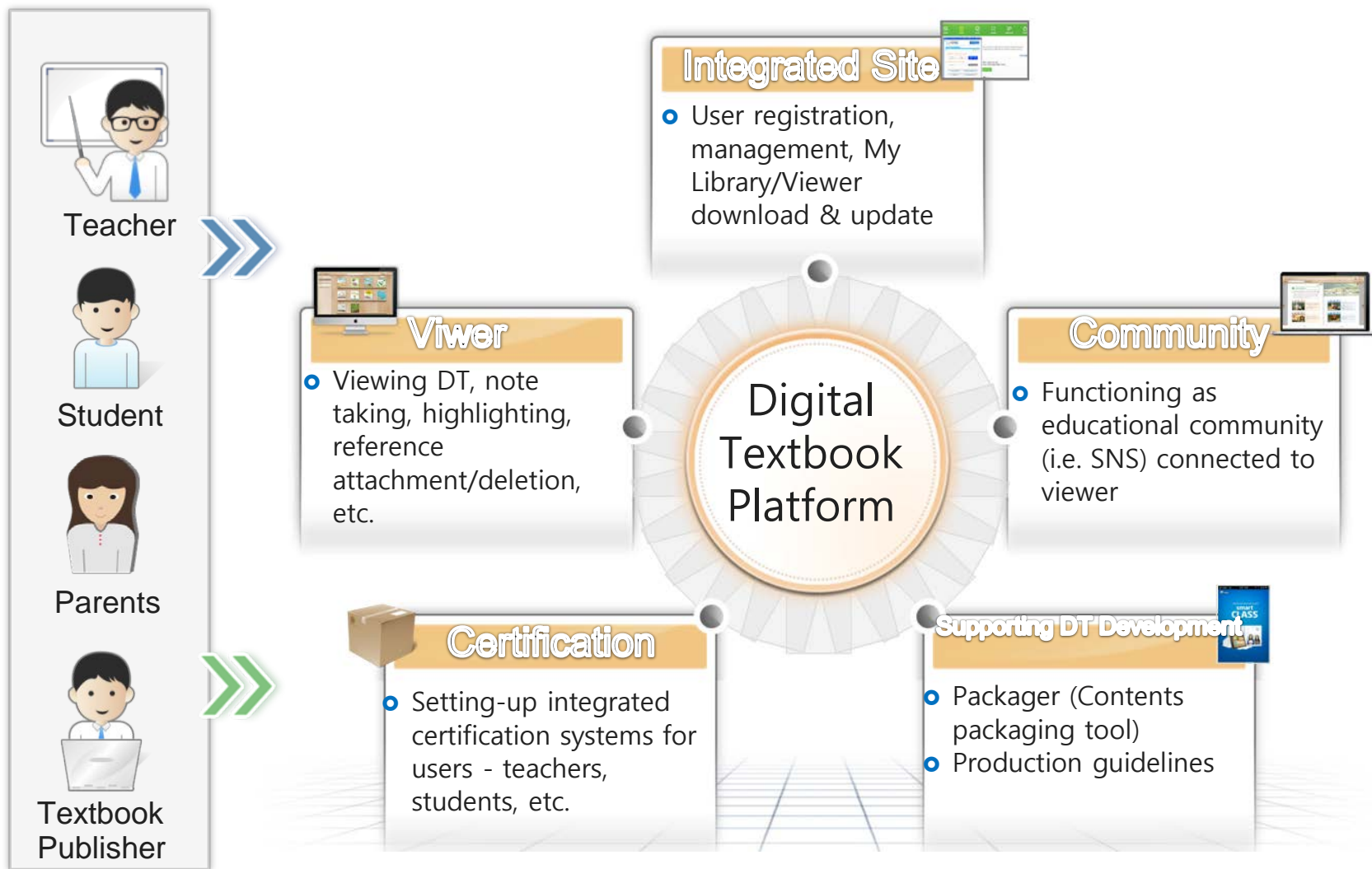
2014

Trial Models of DT Application

- Model schools & applying schools
  * 1st (or 2nd) grade of middle school, 3rd & 4th graders of elementary school
- Social studies & Science subjects (5th grade of elementary school)

2017~

Expansion of DT

- Establishment of learning environments for combining paper textbook with digital textbook (teaching/learning resources)

Digital Textbook Platform

Teacher

Student

Parents

Textbook Publisher

Integrated Site
- User registration, management, My Library/Viewer download & update

Viewer
- Viewing DT, note taking, highlighting, reference attachment/deletion, etc.

Digital Textbook Platform

Community
- Functioning as educational community (i.e. SNS) connected to viewer

Certification
- Setting-up integrated certification systems for users - teachers, students, etc.

Supporting DT Development
- Packager (Contents packaging tool)
- Production guidelines

Setup of Standards for Digital Textbook

Contents Area

■**Packaging(Publication): EPUB 3.0**

■**Publication management: XML**
- Publisher, subject name, author, etc.
- DT configuration (Table of contents, chapters, etc.)

■ **Expression of DT**
- Page view: HTML 5 / CSS 3
- Text: UTF-8
- Image: jpg, png, gif, svg
- Video: MP4
- Audio: MP3
- User interaction: JavaScript

> Contents expression formats such as AR and MathML(supported by HTML 5 and EPUB 3.0) express various learning contents (multimedia data, glossary, test items, supplementation and enrichment data, etc.)

Viewer Area

■**Contents viewing & teaching/learning: Applicable to 3 major OS (Windows, Android, IOS)**
- Teaching/learning: Note (writing, memo, highlighter, bookmark, hyperlink), record, etc.
- View: Page turning, page zoom-in/out, table of contents (move), etc.

■**Functions of execution of teaching/learning aid platform & its link to outside** (communities, outside dictionaries, etc.)**: Open API type link**
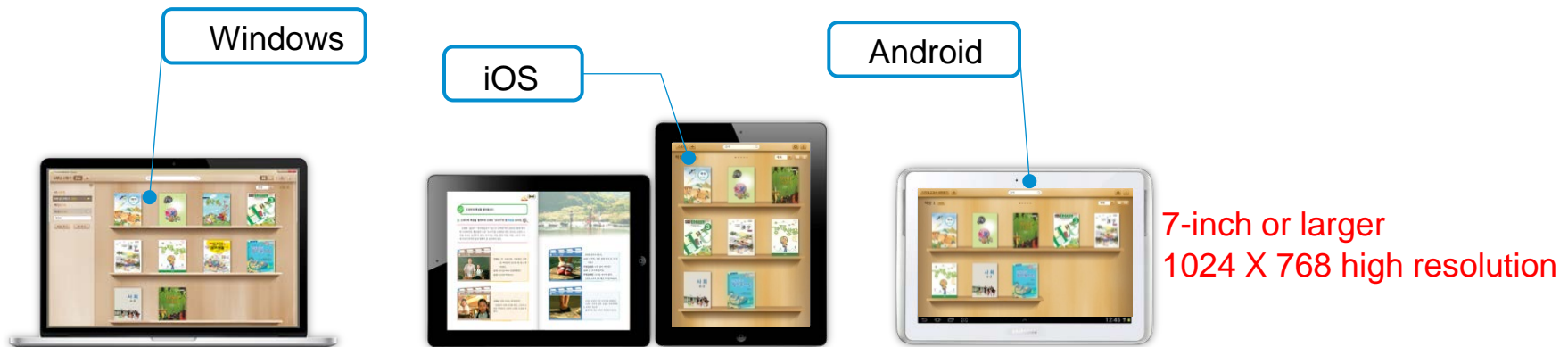
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Digital Textbook Uses & Status

- **Download from PCs, Notebook Computers, Smart Devices**

  - Utmost use of already existing environments recommended

  - 57 new smart pads purchased on average per model school

| Windows | iOS | Android |

7-inch or larger
1024 X 768 high resolution

※ Survey on basic infrastructure of DT model schools (Answered by 119 schools, Apr. 2014)

- **A survey on use of DT in 163 model schools shows that more than 90% of classes are taught by means of both DTs and paper textbooks.**

※ Survey on DT use in 2014 (Answered by 162 schools, Sep. 3 thru 5, 2014)

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Prototype of Learning Analysis System

Design of Learning Analysis System

Learning activity data > Learning analytics algorithm > Learning analytics result

Data on using digital textbooks
- Login (count)
- highlights/notes (# of times)
- Keyword (lookups, # of times)
- note-taking (# of times)

Data on using learning community
- Writing (# of times)
- Replies (# of times)
- data registration (cases)
- homework submission (cases)
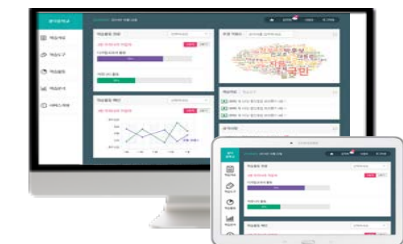
Learning diagnosis data
- learner self-diagnosis
- teacher diagnosis
- teacher assessment

Learning analytics algorithm
- Current state of learning activity
- Learning activity patterns
- Learning data recommendation
- Learning relations analysis
- Learning competency diagnosis
  - interest in subject matter
  - self-regulated learning
  - meta cognition
  - collaboration

Learning analytics result
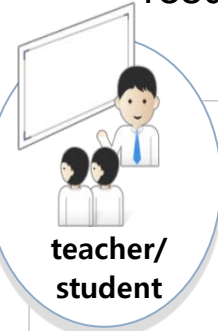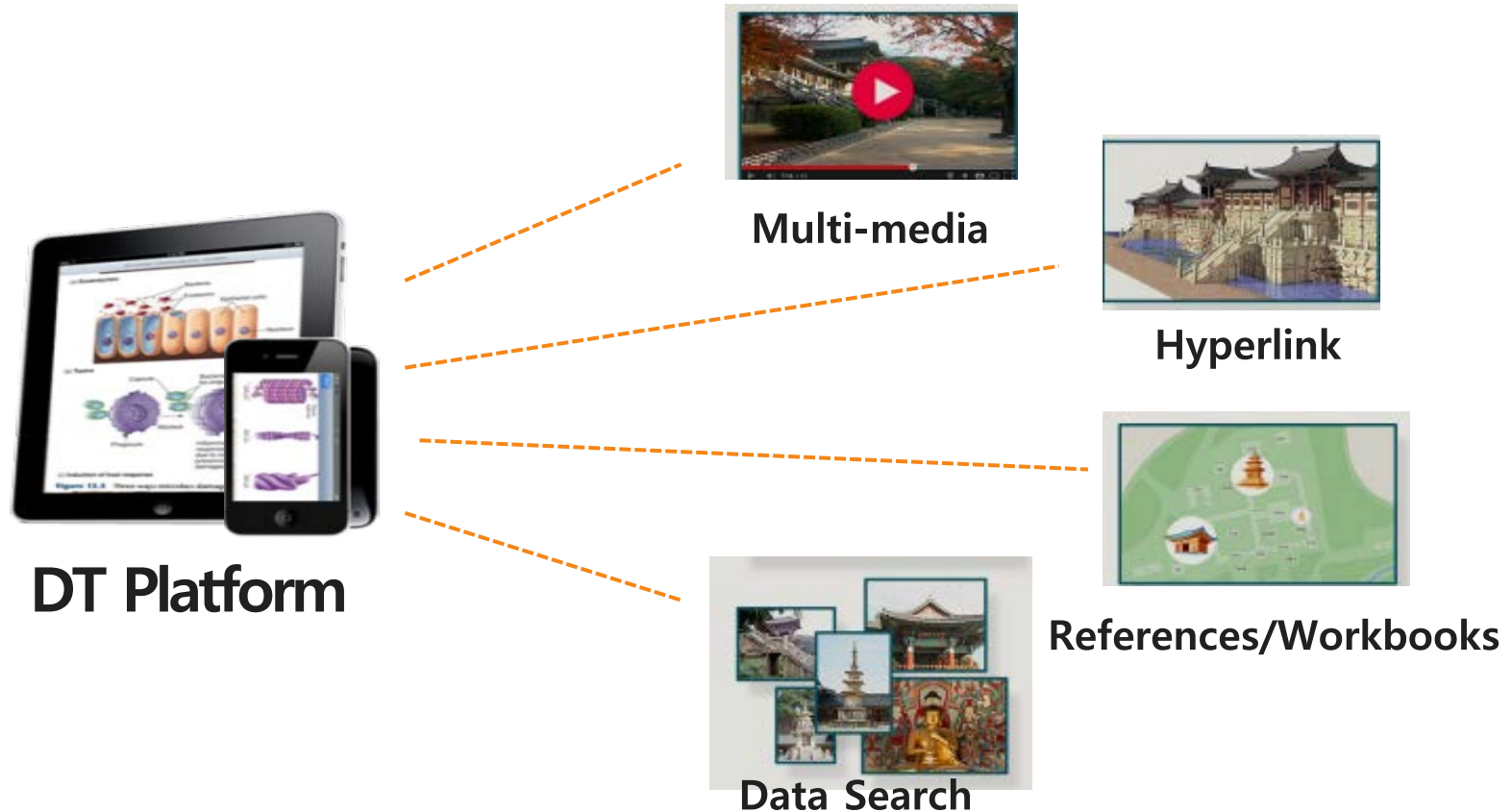
teacher/ student

- Learning tendencies
- Learner Self Directedness
- Learning Competencies
  - Interest in subject matter
  - self-regulated learning
  - meta cognition
  - collaboration

Cases of Digital Textbook Uses

■ **Use of DT & Learning of Knowledge Construction**

Multi-media

Hyperlink

DT Platform

References/Workbooks

Data Search

"Ability to Explore, Construct and Present Knowledge by Using Rich Contents and Various Tools in Diversified Manners"
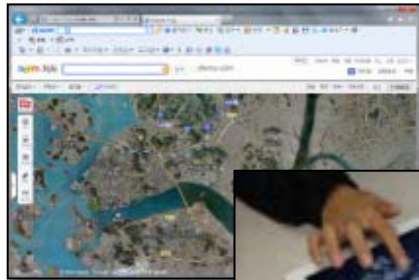
Use cases of Digital Textbook

Case of Knowledge Construction

Learning Shape of the Land
- Learning activity: Model experiment & comparison through navigation of maps
- Tools in Use: Daum Skyview, model experiments tools, Photosynth, VR production apps
- Learning outcomes: Identified regularity and formed concepts thru data comparison

- Access to Daum or Naver Maps with smart tool, and identification of upstreams, midsteams and downstreams of rivers and their characteristics

- Observation of surface changes in water flow through experiment of models outside classroom

- Comparison of data to find regularity and form concepts

- Presentation & sharing of learning results

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Cases of Digital Textbook Uses

Case of Communication Learning

"Writing a report cooperatively on advantages & disadvantages of biotechnology"
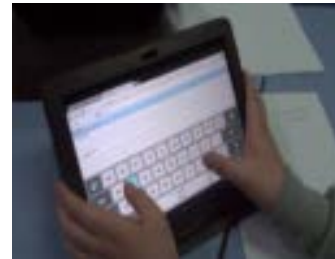
-Find advantages & disadvantages of recent advancing biotechnology around us, decide opinions on the use of biotechnology and write a group report.

- Providing learning goals

- Introducing activities
  ·Case study in group

- Cooperative learning
  ·Sharing of collected data in Google drive
  ·Discussion on effects of the technology on human

- Report writing based on collected data and discussion results

- Presentation/evaluation
  ·Group presentation, and mutual feedback

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Effects of Digital Textbook

Continuously verified by applying to model schools from 2008

Groups using DT showed better results than the group using only paper textbook in academic achievement, self-directed learning, problem solving ability, etc.

Self-direction		Achievement		Problem solving	
2.96	2.90	50.3	49.7	3.43	3.35

DT Class

PT Class (Paper Textbook)
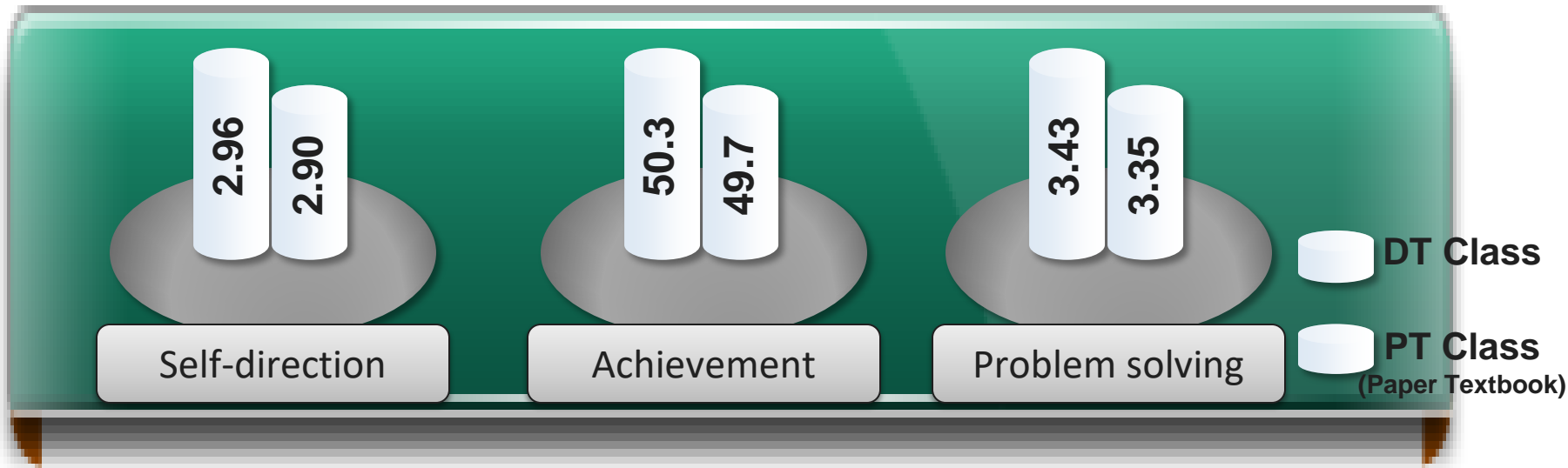
※ Effects of DT measured between 2008 and 2011

Use of digital textbook proved:

- to enhance learning motivation and provide various learning activities
- to show positive effects in learning attitude and satisfaction (in more than 90% of model schools investigated)
- to bring superior outcomes in rural areas than in urban areas (contributing to mitigation of educational gaps)

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Outcome of Digital Textbook

DT Excellence recognized by awarded to Platinum at International Competitive Exhibition(2013)

(Interaction)

(Connection)

At the final round, 17 works (from 8 developed countries-USA, Australia, Canada, etc.) competed.

Evaluated as an exemplary model comprised of integrating digitalized textbook and e-learning service

Offer individualized learning to develop learners' capabilities such as creativity, problem solving ability, communication, cooperation

Issues and Challenges

Laws & Institutions

- Revision of Copyrights Act for promoting DT uses
- Demand for sustainable education policies on budgets, curricula

Education & Culture

- Negative perceptions about educational use of computers
- Development of DT learning models
- Creation of DT environments by promoting voluntary participation of private firms
- Development of teachers' competency

Technology & Infrastructure

- Building advanced classroom environments
- Establishing open & integrated DT platform
- Analyzing learning data in DT environments
- Setting-up open sources for DT
- Constructing standards of DT

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Thank you

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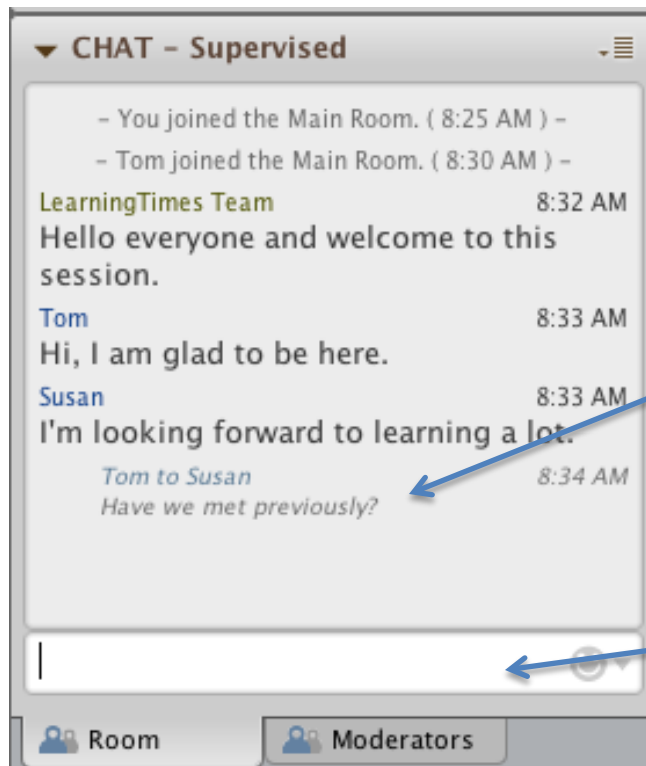- facebook.com/euisuk.jeong.98

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LearningTimes
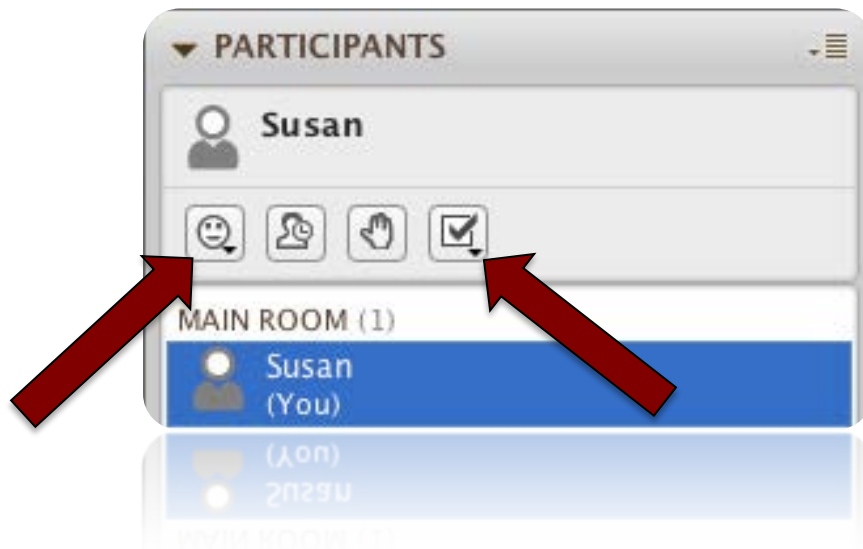
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You have a voice!

Audio Setup Wizard

Click on the Talk button.
We won't be using
Video.

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