Diffusion of Educational Expertise in the 4th Industrial Revolution

May 12, 2017

SUH, Soonshik
(Chuncheon National Univ. of Edu., Korea)
CONTENTS

• Characteristics of the 4th Industrial Revolution
  • Rosy future
  • Gloomy Concern

• How to share Expertise in near future society
  • Advent of new system
  • Transformation of professional work

• Cognitive Learning Process
  • Cognitive overload
  • Digital Dementia

• Student & Teacher Competencies in the future

• Korea’s ICT in Education Policy for Global Partnership

UNESCO Asia-Pacific Ministerial Forum on ICT in Education 2017
Characteristics of the 4th Industrial Revolution
World Economic Forum...

“Today, we are at the beginning of a 4th Industrial Revolution. Developments in genetics, artificial intelligence, robotics, nanotechnology, 3D printing and biotechnology are all building on and amplifying one another.

This will lay the foundation for a revolution more comprehensive and all-encompassing than anything we have ever seen.” (Shwab & Samans, 2016)
THE FUTURE IS ALREADY HERE. IT’S JUST NOT EVENLY DISTRIBUTED YET.

- William Gibson
By 2018, more than 3 million workers globally will be supervised by a “roboboss”.

If you found out your boss was a robot, would you obey its directives?
How to share Expertise in near future society
Future of the professions

• Predict the decline of today's professions and describe the people and systems that will replace them.

• Increasingly capable systems (telepresence, artificial intelligence) will bring fundamental change in the way the practical expertise of specialists is made available in society.
Evolution of professional work

Patterns and trends

Professional work reconfigured
- Routinization
- Disintermediation and reintermediation
- Decomposition

Transformation by technology
- Automation
- Innovation

Preoccupations of professional firms
- Liberalization

The end of an era
- The move from bespoke service
- The bypassed gatekeepers
- Shift form reactive to proactive
- The more-for-less challenge

New labour models
- Labour arbitrage
- Para-professionalization and delegation
- Flexible self-employment
- New specialists
- Users
- Machines

More options for recipients
- Online selection
- Online self-help
- Personalization and mass customization
- Embedded knowledge
- Online collaboration
- Realization of latent demand

Emerging skills and competences
- Different ways of communicating
- Mastery of data
- New relationships with technology
- Diversification


UNESCO Asia-Pacific Ministerial Forum on ICT in Education 2017
Cognitive Learning Process
How do people learn?
Cognitive overload
To consider

- Are we becoming a distracted society?
- Are you finding it harder to concentrate on one thing for long periods?
  - Are you seeing evidence of this in others?
  - Does this matter?
- Is the age of deep reading and contemplative thinking coming to an end?
  - If so, does this matter?
Student & Teacher Competencies in Near Future
Student competency

- Ability development competencies
  - Creativity,
  - Problem-solving ability
  - Communication
  - Collaboration
  - Technology literacy
  - Artistic thinking

- Character building competencies
  - Care
  - Whole-heartedness
  - Challenge
  - Ethics

- Career enhancement competencies
  - Social skills
  - Flexibility
  - Self-direction
  - Leadership
  - Accountability.

Heo et al. (2011). 21st century students’ and teachers’ competencies.

UNESCO Asia-Pacific Ministerial Forum on ICT in Education 2017
Teacher competency

Field practices
Specific educational tasks and activities intended to implement ICT in education

Fundamentals
Personal characteristics which is the foundations for ICT in education implementation

Heo et al. (2011). 21st century students’ and teachers’ competencies.

UNESCO Asia-Pacific Ministerial Forum on ICT in Education 2017
Teacher Competency

**Fundamentals**
- Creative problem-solving
- Social ability
- Communication
- Flexibility
- Technology Literacy
- Ethics
- Passion

**Field practices**
- Understanding of the future education
- Expertise in content
- Building relationships with learners
- Instructional Design and Development
- Building Learning-affordance
- Evaluation and Reflection
- Network Building
## 28 training modules for teacher competency

<table>
<thead>
<tr>
<th>Concept of future education &amp; teacher’s role</th>
<th>Concept of ICT in education</th>
<th>Teacher competency for the practice of ICT in education</th>
<th>Understanding 21C learner competency &amp; strategies for promoting the competency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participating in digital ecosystem</td>
<td>Class observing copyrights</td>
<td>Information &amp; communications ethics</td>
<td>Lesson design for digital native</td>
</tr>
<tr>
<td>Building rapport with learners through ICT in education</td>
<td>Organize creative SMART education programs</td>
<td>Constitute primary theme-centered ICT in education curriculum</td>
<td>Curricular plan by SMART education level</td>
</tr>
<tr>
<td>Learning smart learning tools</td>
<td>SMART learning environment design</td>
<td>Collaborative learning design for communication</td>
<td>Learning design for lively experience</td>
</tr>
<tr>
<td>Self-directed intelligence-type customized learning design</td>
<td>Using digital textbooks</td>
<td>Immerging into the sea of ICT in education content</td>
<td>Comprehensive design for school SMART education system</td>
</tr>
<tr>
<td>SMART education design for outside the school</td>
<td>Features &amp; methods of SMART education assessment</td>
<td>Learning process-centered evaluation for 21C competency</td>
<td>SMART education &amp; on-site studies</td>
</tr>
<tr>
<td>Strategies for implementing &amp; facilitating ICT in education lessons</td>
<td>Method of monitoring learning process</td>
<td>How to cope with problems in ICT in education class</td>
<td>Constant cultivation of expertise for ICT in education</td>
</tr>
</tbody>
</table>
Teacher Competencies

**Fundamentals**

1. Creative problem-solving
2. Social ability
3. Flexibility
4. Technology literacy
5. Ethics
6. Passion

**Practice competencies**

7. Understanding of future education
8. Contents expertise
9. Building relationship with learners
10. Instructional design & development
11. Building learning affordance
12. Evaluation & reflection
13. Building collaborative relationship with community

Teacher Training Modules

1. Concept of future education & teacher’s role
2. Concept of ICT in education
3. Teacher competency for the practice of ICT in education
4. Understanding 21C learner & strategies for promoting the competency
5. Participating in digital ecosystem
6. Class observing copyrights
7. Information & communications ethics
8. Lesson plan for digital native
9. Building rapport with learners through ICT in education
10. Organize creative ICT in education programs
11. Constitute primary theme-centered ICT in education curriculum
12. Curricular plan by ICT in education level
13. Learning smart learning tools
14. SMART learning environment design
15. Collaborative learning design for communication
16. Learning design for lively experience
17. Self-directed intelligence-type customized learning design
18. Using digital textbooks
19. Immerging into the sea of ICT in education content
20. Comprehensive design for school ICT in education system
21. ICT in education design for outside the school
22. Features and methods of ICT in education assessment
23. Learning process-centered evaluation for 21C competency
24. ICT in education and on-site studies
25. Strategies for implementing & facilitating ICT in education lessons
26. Method of monitoring learning process
27. How to cope with problems in ICT in education class
28. Constant cultivation of expertise for ICT in education

UNESCO Asia-Pacific Ministerial Forum on ICT in Education 2017
Korea’s ICT in Education Policy for Global Partnership

UNESCO Asia-Pacific Ministerial Forum on ICT in Education 2017
e-Learning Globalization Project

Current Partner Countries

Europe
- Moldova

Africa
- Kenya

Southeast Asia
- Laos
- Vietnam
- Cambodia
- Philippines

South Asia
- Bangladesh
- Sri Lanka
- Nepal
- Myanmar

Central Asia
- Mongolia
- Uzbekistan

Latin America
- Colombia
- Paraguay
- Guatemala
- Honduras
- Peru
- Nicaragua
e-Learning Globalization Project

Invitation e-Learning Training

- A total of 4,588 teachers and government officials from 22 countries had been invited from 2005 to 2015.

e-Learning Infrastructure Support

- Total 26,460 refurbished or new PCs had been provided to 28 countries from 2005 to 2015.
Global Symposium on ICT in Education (GSIE)

- Expanding educational opportunities through ICT in education
- Knowledge and information gaps resolved
- Experience e-Learning and set up education innovation strategy.
- 2007~2015 : 784 participated from 74 countries

Date: Nov, 9th~11th, 2016

Hosts: Korean Ministry of Education (MOE), World Bank

Organizers: Korea Education and Research Information Services (KERIS)

Partner Organizations: UNESCO Bangkok, Intel Asia-Pacific

Participants: High-level policy makers of e-Learning sector from 25 developing countries (Asia, Africa, Central and South America etc.)
e-Learning Globalization Project

**e-ICON World Contest**

- Developing global e-Learning contents
- International contest in the field of e-Learning
- 18 countries 531 students ('11~'16)

UNESCO Asia-Pacific Ministerial Forum on ICT in Education 2017
Innovative ICT-Based Pilot Classroom

**Status**

**Contents**

- Establishment and operation of ICT-based pilot classroom
- ICT Education Forum between partner countries and Korea
- Follow-up support to ICT-based pilot classroom in countries
- Contents, Equipment, Visiting training for Teachers
Innovative ICT-Based Pilot Classroom

Project Outline

- Major Activities

1. Building the ICT Classroom
2. Holding the Int’l Forum & Opening Ceremony
3. Supporting teacher training
4. Providing ICT equipment
5. Supplying contents & solutions
6. Supporting teacher training
7. Analyzing and evaluating the project outcome
8. Reflecting the outcome for the next year planning
Innovative ICT-Based Pilot Classroom

Plans

• Establishment ICT-based pilot classroom 2016

  Opening Ceremony and ICT Education Forum
  ➢ Mix La Molina School in Lima
  ➢ Oct, 6th, 2016 (be scheduled)

• Establishment ICT-based pilot classroom 2017

  Opening Ceremony
  ➢ School in Vientiane
  ➢ Nov, 2016 (TBD)

UNESCO Asia-Pacific Ministerial Forum on ICT in Education 2017
**SPIS** (Solar Powered Internet School)

---

**Purpose**

- To bridge digital divide and enhance capability of teachers in Africa using the self-powered classroom

---

**Programs**

- Customized ICT in education training and invitation
- Training for leading teachers

---

**Equipment**

- Solar-power charging system and ICT equipment in a large container
### SPIS (Solar Powered Internet School)

#### Status and Plan

<table>
<thead>
<tr>
<th>Year</th>
<th>Status</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>established</td>
<td>Kenya, Ghana, Ethiopia</td>
</tr>
<tr>
<td>2016</td>
<td>established</td>
<td>Uganda, Rwanda, Mozambique</td>
</tr>
<tr>
<td>2017</td>
<td>plan</td>
<td>Zambia, Zimbabwe, Tanzania</td>
</tr>
</tbody>
</table>
Diffusion of Educational Expertise in the 4th Industrial Revolution

THANK YOU