

Educational Innovation in the Era of Digital Revolution

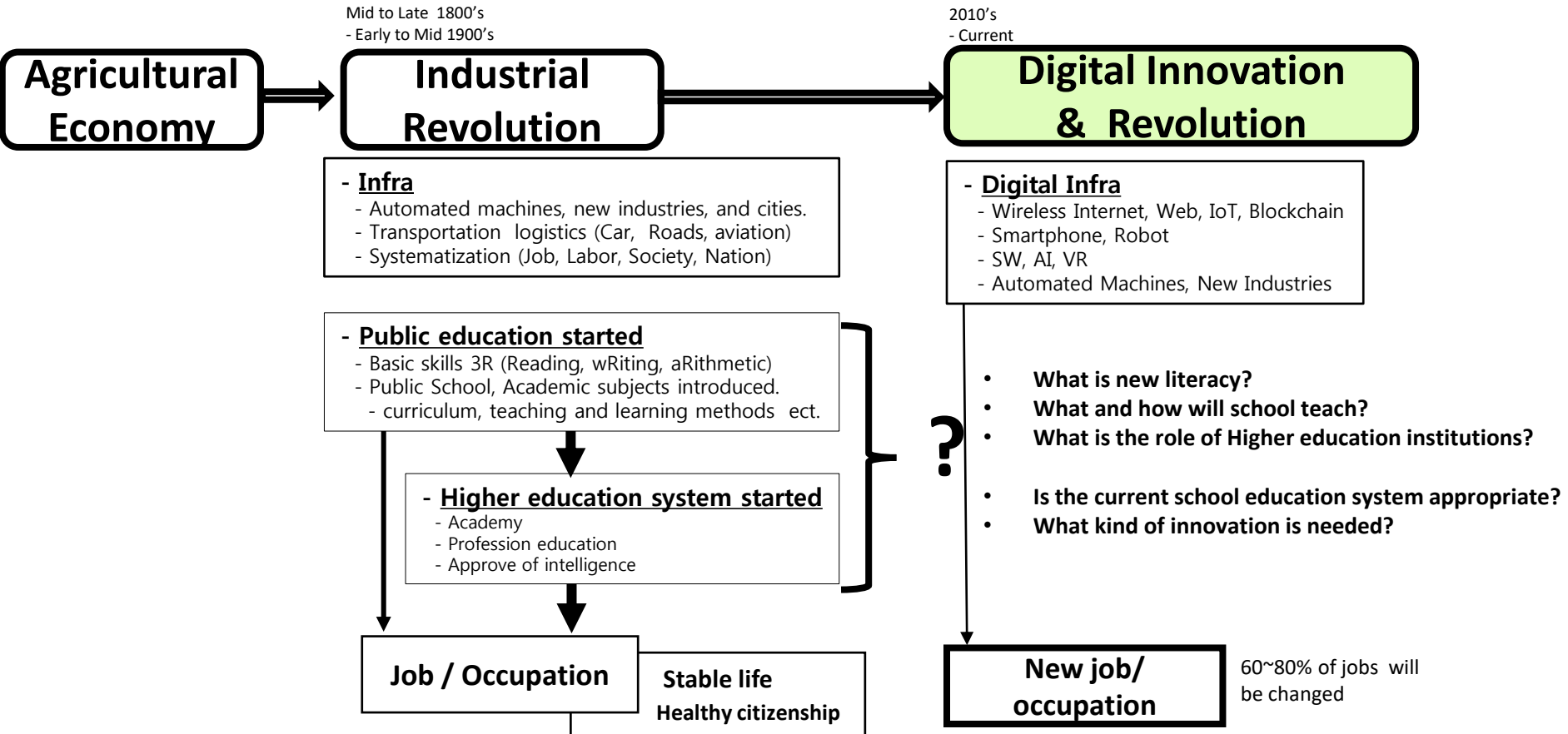
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2018.11

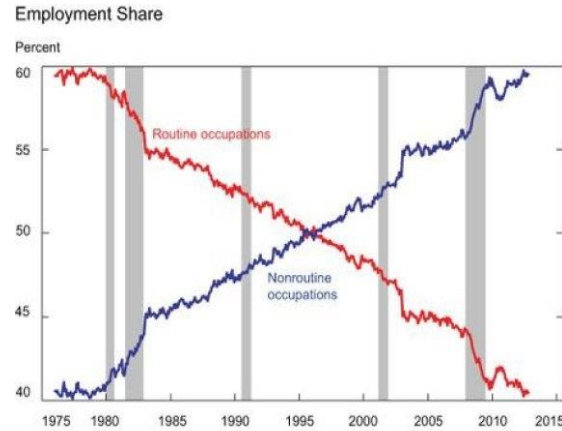
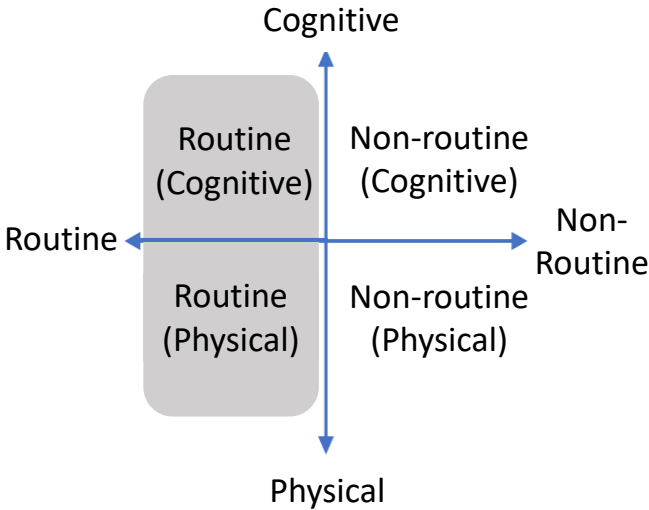
Overview



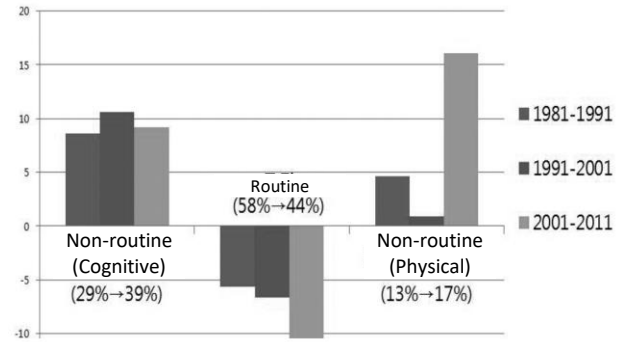
New literacy and skills

Digital Revolution Era

The changing trends in occupation

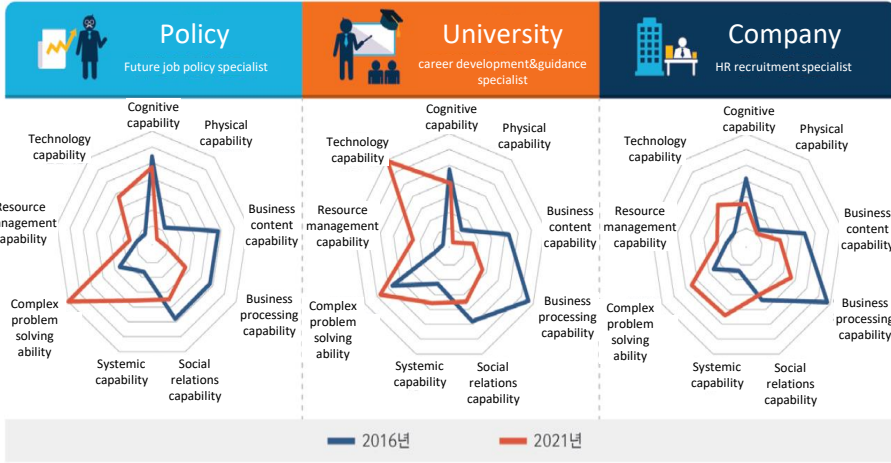


Source: U.S. Census Bureau, Current Population Survey.
 Note: The bands indicate recessions as defined by the National Bureau of Economic Research. U.S. Census Bureau

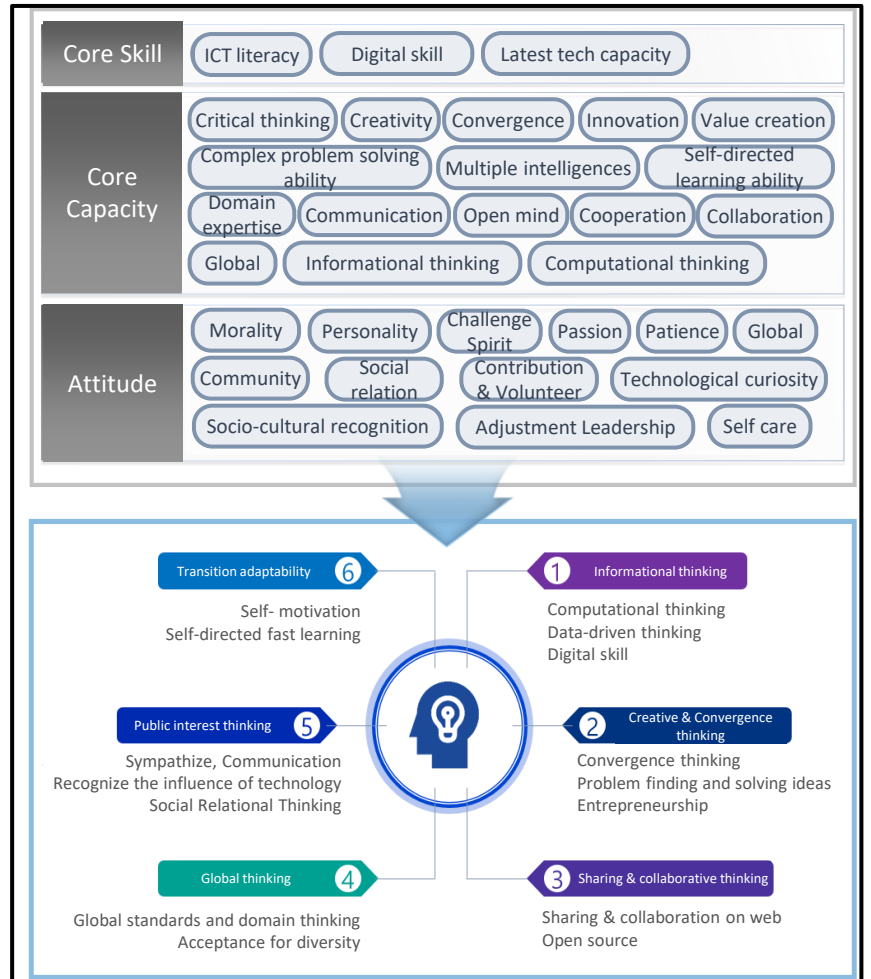


미국의 직업별 고용비중 변화(컴퓨터 기술진보와 직업구성 변화, 최창욱, 월간SW중심사회, 2015년 6월호 : 인용)

Future Capabilities



미래의 중요 역량에 대한 인식(2016년 VS 2012년) : 미래창조과학부 미래준비위원회, KISTEP, KAIST(2017년) 인용



Digital Infra

Informational Thinking

Computing Thinking, Digital Skills, ICT Literacy

Creative and Connective Thinking

Problem finding and solving

Sharing and Collaborative Thinking

**Adaptability to change,
Entrepreneurship**

**Global mind,
Public interest**

Occupation and Career

**Coding Education,
Software Education**

Is the Current School System Appropriate
for New Capabilities?

Digital World

Creation

convergence

Innovation

Change of
Occupation

Need of New
Capabilities

Tech Titans

Top 10 companies by market capitalization listed on U.S. exchanges, in billions



*Facebook was not public 5 years ago Source: FactSet THE WALL STREET JOURNAL



GAP

Marketing

Humanities

Sociology

Science

Business
management

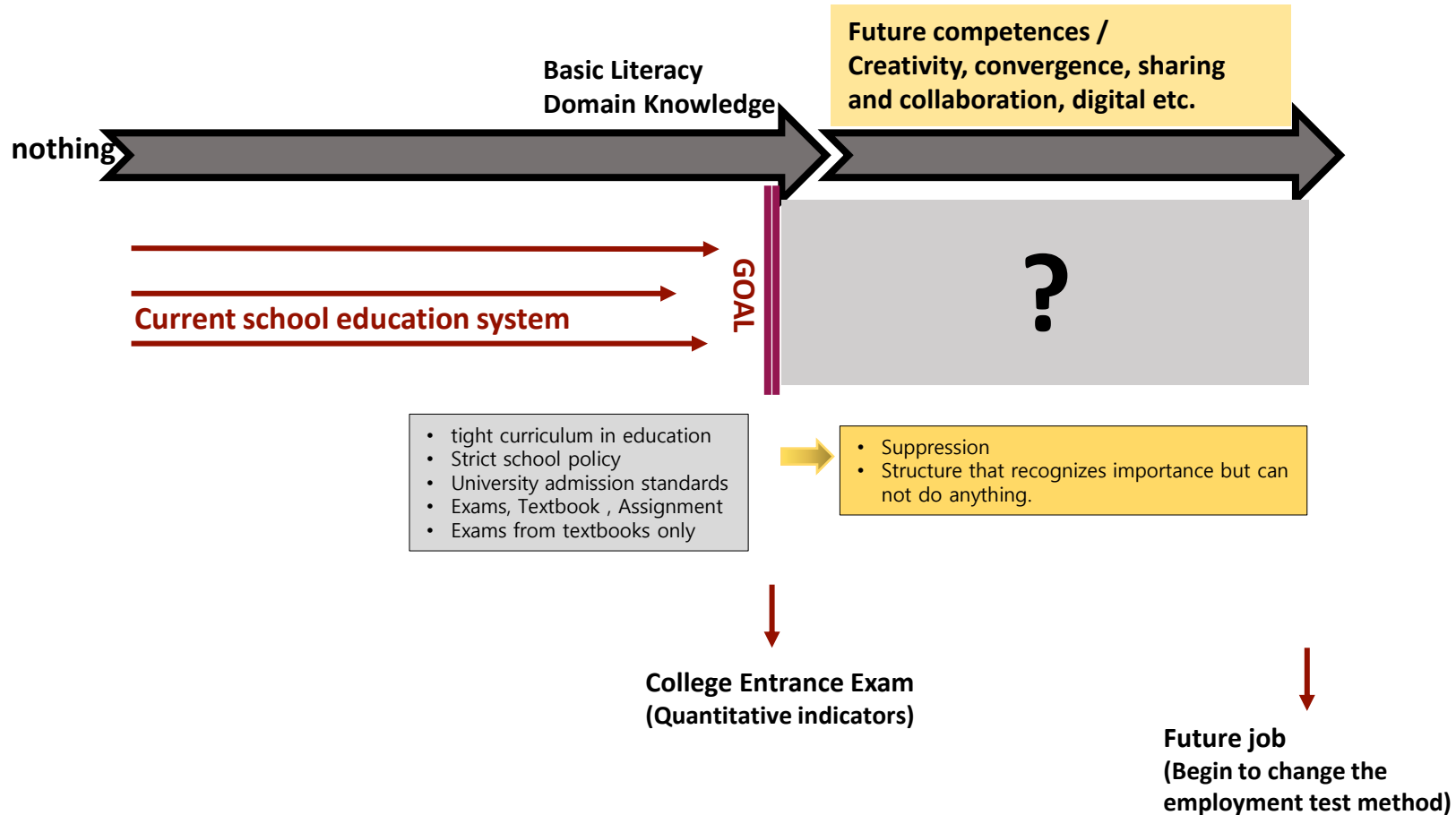
Culture

Art

Mathematics

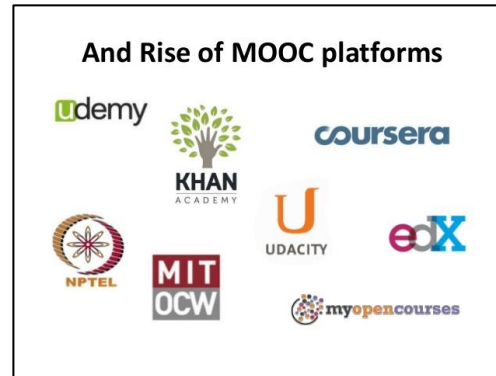
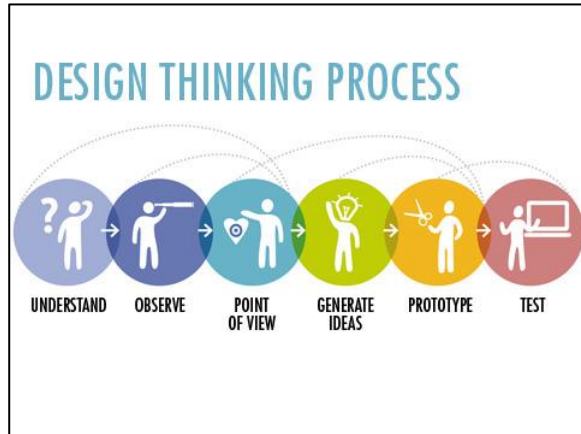
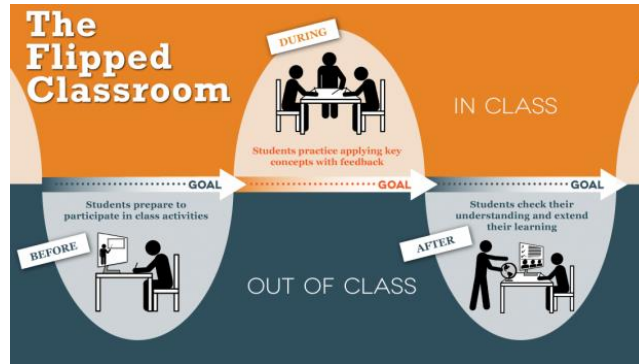
Engineering

Basic assumption (Our educational framework)



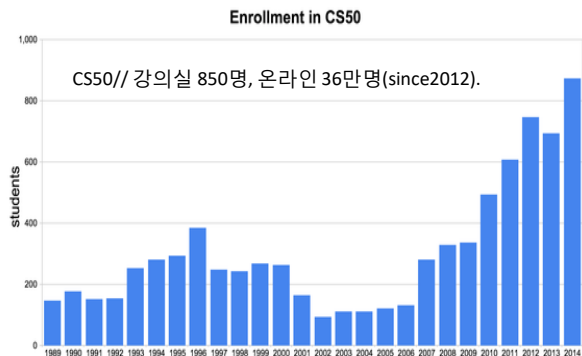
What Innovative Changes are being attempted?

Changes in Methods of Teaching and Learning



Changes in universities

- 95% of Stanford students taking CS subjects
- CS50 class of the Harvard University
- General education classes of Korea Univ, KAIST
- Interdisciplinary major (IT Industry, IT startup etc.)
- Open major
- Alternative education system(MOOC Nano-degree)



New Subject in School : Computer Science, Computing, Informatics, Computational Thinking

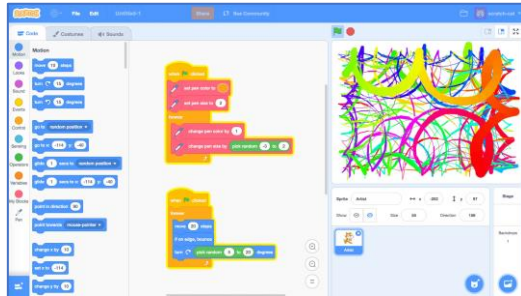
- Attention to the current World
- Problem Finding
- Creative thinking
- Expressing ideas
- Improvement

Programming (coding)
Digital Skill
Digital Literacy

- Sharing and Collaboration
- Digital literacy
- Public interest
- Data driven thinking

Educational programming

- Scratch, Entry
- Python, Javascript

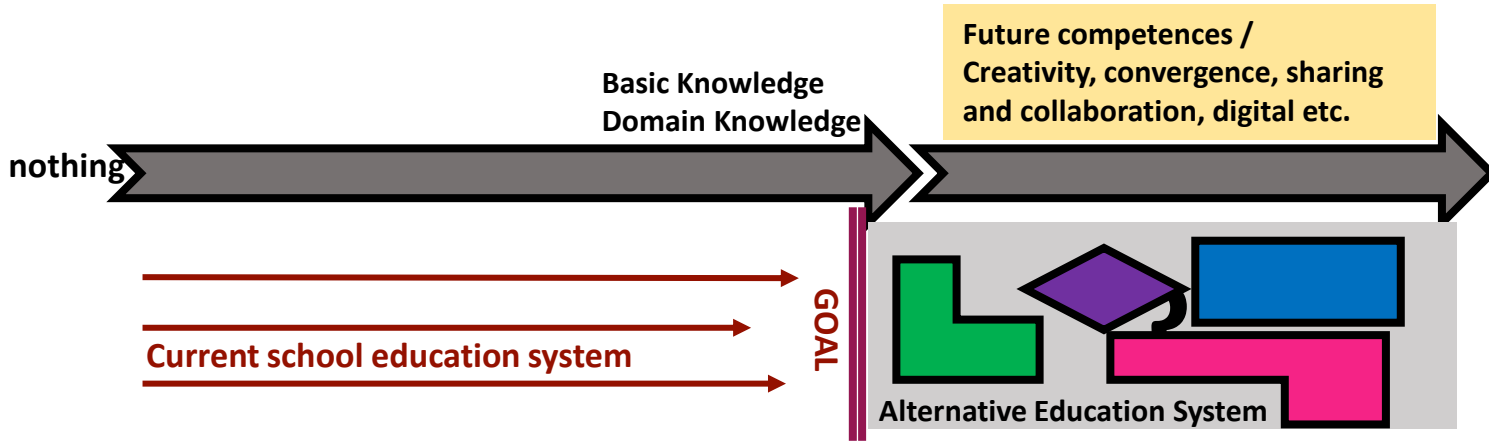


world

software,
internet

- Automation
- Data
- Digital

Attempts



- **New Attempts from traditional educational system**

- Flipped learning, smart learning
- absolute grading scale, essay test
- Introduction of credit system in High school,
- Reformation of entrance examination, university student quota
- No major or open curriculum, micro degree, credit banking system

- **Need for alternative educational system**

- Open access to anything he/she wants to learn.
- Opportunities to learn are always available
- What you learn can be directly connected to reality

- **Attempted Methods**

- Connected Learning (connected mentors, co-eds, hyper-connectivity)
- Personalized, Project-based, Fast Learning Tech (ex. ITS)
- self-motivated (importance of coaching)

- **Example)**

- MOOC Nanodegree, Micro-college, Minerva School, github etc.
- Connect School, Entry, ModuLab, Samsung junior SW academy etc.

Challenges

Radical Changes

Job, workplace

Graduated school

Colleges

Alternative
educational
system

Where and how should future
capability education be taught?

Give them a second chance.

University Entrance Examination

Is the current entrance examination model helpful?
(from the perspective of future skills)

High school

College preparation,
competition education

Learn to compete and give up,
inferiority/superiority in competitive environment

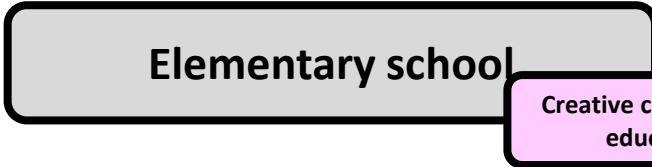
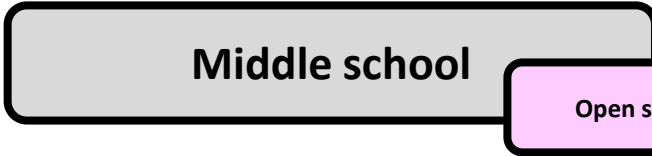
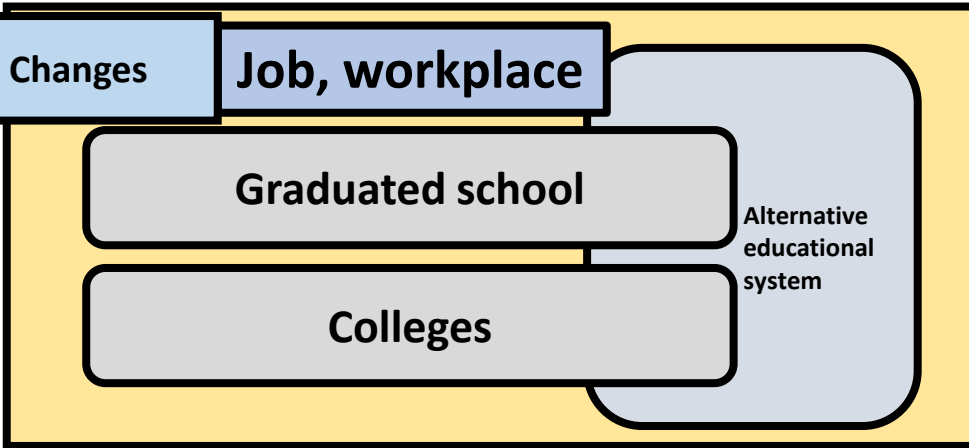
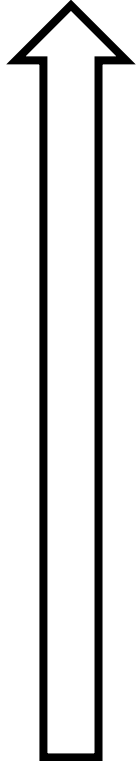
Middle school

Open semester

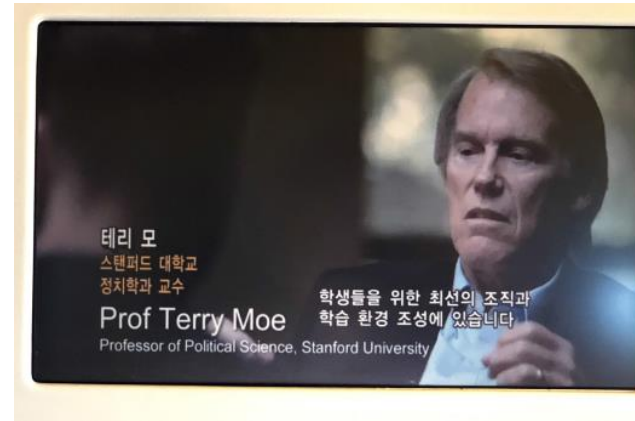
Elementary school

Creative convergence
education

Need encouragement and positive feedback
Learn to care and collaborate



Needs Consensus and Agreement in the Society



“What’s the point of the school system? To educate children. That’s the only point of the school system. “

“The revolution in information technology, which is one of the most powerful, transformative events in history of the world. It sound like a hyperbole, but it isn't.”

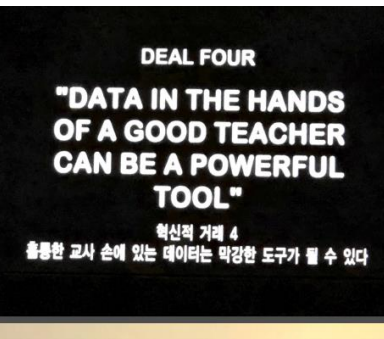
“Computers ironically can give them personal experience, one on one. You compare that to the standard model of a teacher and 30 students. What is that. The teacher has to provide a standardized curriculum to every body in the class. Its completely inefficient as a way of teaching kids. “



“Data in hands of good teacher can be a very powerful tool. But if your reason for doing it is to introduce market forces and ultimately a consumer market in educational products, which is where they are heading with this. At the very least we need to have a conversation about this. This is about improving education for children and their prospects of future or is this about privatization of education.”

“It doesn’t help children to learn. It lowers standards. Actually heavy use of technology in education, the results are dreadful. It’s not helping them to learn.”

“The problem is false, the solution is false narrative as well. “



Efforts to Apply SW Education in Korea

Introduction of Compulsory SW curriculum

2015 National Curriculum

- Mandatory course hours
 - elementary 17hrs
 - middle-school 34hrs
 - High school - optional

- Develop curriculum
 - Elementary - practical course, middle school - information curriculum
- Textbook and contents
- Teacher training
- Status of beacon school, leading school
 - 1600 schools
 - Up-to-date school facilities (internet, computer, teaching tools)
- educational environment improvement
 - EBS online SW education platform
 - proliferation of contests and competition
 - Admission for SW talented students
- Foster Social interest and consensus
 - Articles and documentary in public media
 - Collaboration with Companies(Samsung, Naver etc.)
- Global connections
 - Translated Textbook, exchange teachers, workshop
 - BCS, CSTA ,code.org , scratch foundation, etc.

2018, 2019, 2020 Middle School

2019, 2020 Elementary School

Challenges to overcome

- Lack of credit hours
- An independent discipline
 - Subject teachers
 - Qualification of teachers
 - High school Curriculum
- Need for constant improvement in curriculum
- Training program for CS teachers

Thank You

김현철

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