The Upcoming Upheaval in Education and Opportunity of K-12 SD/ST Education - Focused on Korean Case

Chang-Kwon Chung, Ph.D.
(Benjamin)

Sunday 1 July 2018

Babson Executive Conference Center, Wellesley, Massachusetts
Chang-Kwon Chung Ph.D. (Benjamin)

Present
President, Korean System Dynamics Society
CEO, System Leadership Institute (non-profit organization)
World Climate Ambassador, WorldClimateInteractive
Adjunct professor, Seoul School of Integrated Sciences & Technologies

Academic
Ph.D, Seoul School of Integrated Sciences & Technologies (Strategy)
EMBA, Aalto University (International Design Business Management)
B.A., Seoul National University (German Education)

benjamin@System-Leadership.org

Non-profit organization
System Leadership Institute
My dream comes true.
Structure Analysis on Education Environment

2018 CLE Conference Keynote Speech
Basic frame

Desired Level → Gap → Corrective Action → Current State → Desired Level

+ Desired Level
+ Gap
+ Corrective Action
+ Current State
- Desired Level
- Gap
- Corrective Action
- Current State
Distorted Learning Structure

- Obsession with fast learning
- Current State of learning
- Accumulation of learning
- Desired Level of capability for the future
- Worry of parent
- Short-termism of elective officer of education
- Efficiency of learning technology
- Time needed to be learnt
- Slow learning
- Dependency
- Slow learning

Factors:
- + indicates a positive relationship
- - indicates a negative relationship
Distorted Learning Structure

Desired Level of capability for the future

Gap

Current State of learning
Desired Level of capability for the future

Gap

Current State of learning

Accumulation of learning

Obsession with fast learning
Desired Level of capability for the future

Gap

B

Accumulation of learning

Efficiency of learning technology

+ + + + +

Current State of learning

+ + +

Obsession with fast learning

+ + +
Distorted Learning Structure

- Obsession with fast learning
  - Accumulation of learning
  - Efficiency of learning technology
  - Time needed to be learnt
  - Desired Level of capability for the future
  - Gap

- Current State of learning

+ indicates a positive relationship, and - indicates a negative relationship.
Distorted Learning Structure

Obsession with fast learning

Desired Level of capability for the future

Gap

Efficiency of learning technology

Current State of learning

Accumulation of learning

Time needed to be learnt
Desired Level of capability for the future

Gap

Current State of learning

Time needed to be learnt

Accumulation of learning

Obsession with fast learning

Short-termism of elective officer of education

Efficiency of learning technology
Distorted Learning Structure

Desired Level of capability for the future

Worry of parent

Gap

Obsession with fast learning

Accumulation of learning

Current State of learning

Time needed to be learnt

Efficiency of learning technology

Short-termism of elective officer of education
Distorted Learning Structure

- Obsession with fast learning
- Worry of parent
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- Efficiency of learning technology
- Dependancy
- Gap
- Desired level of capability for the future
- Accumulation of learning
- Current state of learning
- Time needed to be learnt
Distorted Learning Structure

Desired Level of capability for the future

Gap

Obsession with fast learning

Current State of learning

Accumulation of learning

Time needed to be learnt

Slow learning

Worry of parent

Short-termism of elective officer of education

Efficiency of learning technology

Dependency

+ + + +

R R R R

+ + + +

B B B B

- - - -
Distorted Learning Structure

- Obsession with fast learning
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- Dependency
Distorted Learning Structure

Desired Level of capability for the future

Worry of parent

Obsession with fast learning

Current State of learning

Time needed to be learnt

Accumulation of learning

Short-termism of elective officer of education

Efficiency of learning technology

Dependency

Slow learning

+ + +

- - -
The Current Reality of Schooling

p. 9~15.
The Current Reality of Schooling

- The pace of knowledge
- Frustration with the quality of education
- Technological change
- Economic stress and social uncertainty
- Worldwide interdependence
The Upcoming Upheaval in Education

Distorted Learning Structure

- Obsession with fast learning
  - Worry of parent
  - Desired Level of capability for the future
  - Shor-termism of elective officer of education
  - Efficiency of learning technology
  - Time needed to be learnt
  - Dependency

The Current Reality of Schooling

- The pace of knowledge
- Worldwide interdependence
- Economic stress and social uncertainty

We cannot change the structure as it stands.
We need another structure for change in education.
My Vision

Desired Level of education → + Gap → + Current State of Korean education

Searching for novelty (alternatives) → + Curiosity on SD/ST education → + Acceptance rate of K-12 SD/ST education
My Vision, generalized

Desired Level of education

Gap

Need for SD/ST education

K-12 SD/ST education

Current State of education
My Strategy

1. Needs Management
2. Focus on Climate Change
Strategy 1. Needs Management

Desired Level of education

Pace of change

Needs to learn how to interpret change

Inability of education to respond to global standards

K-12 SD/ST education

Gap

Current State of education

Needs to learn how to handle complexity

Complexity of system

Needs to learn global standards

+ + + +

Needs to learn how to interpret change
Strategy 1. Needs Management

Pace of change

Needs to learn how to interpret change

Inability of education to response to global standards

Needs to learn global standards

Complexity of system

K-12 SD/ST education

Needs to learn how to handle complexity

Desired Level of education

Gap

Current State of education
Strategy 1. Needs Management

Inability of education to respond to global standards

Needs to learn global standards

Needs to learn how to interpret change

Pace of change

K-12 SD/ST education

Desired Level of education

Gap

Current State of education

Complexity of system

Needs to learn how to handle complexity

Orienting to global standards
Strategy 1. Needs Management

Inability of education to respond to global standards

- Needs to learn global standards
- Needs to learn how to interpret change
- Needs to learn how to handle complexity

K-12 SD/ST education

Desired Level of education

Current State of education

Pace of change

Complexity of system

+ + + +

B

Gap
Strategy 1. Needs Management

- Inability of education to respond to global standards
- Pace of change
- Needs to learn how to interpret change
- Complexity of system
- Needs to learn how to handle complexity
- K-12 SD/ST education
- Desired Level of education
- Current State of education

Gap

Needs to learn global standards

Needs to learn how to handle complexity
Global Recognition, UNEP

Syllabus

Wicked Problems, Dynamic Solutions - Systems Thinking And The Ecosystem Approach

Linear Thinking

Systems Thinking
Global Recognition, OECD

Observatory of Public Sector Innovation

Systems Approaches for Public Policy Challenges

Author:
Piret Tõnurist
Innovation Specialist

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Strategy 2. Focus on Climate Change

- Desired Level of education
- Gap
- Current State of education
- Climate change

Needs to learn how to interpret change

Fishery Game

K-12 SD/ST education

The Climate Change Playbook
Your turn to negotiate
5 Objectives for the Strategy
Korea Case
Brands

Systems Thinking with Games

- Systems Thinking with games for environment club
- Systems Thinking with games for social science club
- Systems Thinking with games for humanities club
- ...
- MIT Creative Class with Games
Achievement since 2014

- Elementary school students (K3~K6): 280
- Middle school students (K7~K8): 2,300
- High school students (K10~K11): 450

Students

- World Climate Simulation Game (including adults)
  73 events, 2,122 participants since August 2016
- The Shape of Change including Stocks and Flows (K7): 2,300
- Beer game participants (K7~K11): 16 (1 class)
- Fishery game participants (K7~K11): 350
- Hamlet modeling (K7~K11): 300
- Modeling with Vensim (K10~K11): 15 (1 class)

Game & Modeling
Achievement since 2014

Duration of the class:
- 2~3h: 20%
- 4h~8h: 60%
- more than 14h: 20%

No class for one semester term until now
Five Objectives

Beyond School

Academia

Within Schools

K-12 SD/ST Education

Contents

Provider
Beyond the School

School is an entity in the middle of the interaction.
Beyond the School

School is an entity in the middle of the interaction.
Beyond the School

School is an entity in the middle of the interaction.

pp.16-25
Beyond the School

The strong initiatives are from beyond the schools.

- Local Government (fund), Government (laws)
- Korean case

Free semester program for K7

- If not, wait!
- Challenge: to involve company to change education.
Implication of Beyond the School

Opportunities

- Local governments have more money and needs collaboration with school.
- SD/ST can fill the gap between desired level and current state.
- Schools are not ready to embrace the world outside the school’s wall, which means schools need trust-worthy program.

Challenges

- Respect their rule: local government and Ministry of Education
- It takes long time for them to take SD/ST since they show interests in it.
- Schools would disappoint us but we should take for granted their inertia and reluctance against change. Dialogue is the only solution.
Five Objectives

Academia

Beyond School

K-12 SD/ST Education

Within Schools

Provider

Contents
Within School (teachers’ learning organization)

KOREA COMPLEXITY EDUCATION RESEARCH GROUP

- Joined since 2016
- 65 members
- Monthly meeting

Contents
Within School (teachers’ learning organization)

KOREA COMPLEXITY EDUCATION RESEARCH GROUP

Translation team of Schools That Learn
Within School  (teachers’ learning organization)

GOOD PEOPLE FOR HAPPY EDUCATION
- Joined since 2018
- 119 members
- Monthly meeting

I am in charge of Systems Thinking Group.
Implication of Within the school

**Opportunities**

- Being informed, teachers love the concept of interaction and feedback.
- Interdisciplinary program is the irresistible and unavoidable issue for teachers.

**Challenges**

- There are always teachers who would be interested in SD/ST education. Find them.
Five Objectives

Beyond School

Academia

K-12 SD/ST Education

Within Schools

Contents

Provider
Two pillars for providing K-12 SD/ST

Teacher

Professional Lecturer outside the school
ST in selective program for 140,000 teachers in Kyunggg province

First time in Korea
June 2018, 6h
Fishery Game (3h)
ST workshop (3h)
Official Professional Development Program for Teachers

- First time in Korea
- June 2018, 6h
  - Fishery Game (3h)
  - ST workshop (3h)
Professional lecturer

- Public recruitment and training
  - Year 2015 and 2017
  - 20 hour-long program
- Most of them are discontinued women.
- 20 of 52 members are selected.
  - They run 16 hour-long program for 2,300 K-7 students

- Threat:
  - Sensitive to the tuition and the stability of opportunity to teach.
  - The dependency on local government’s fund is very high.
Implication of Provider

Opportunities

- Being informed, teachers love the concept of interaction and feedback.
- Interdisciplinary program is the irresistible and unavoidable issue for teachers.

Challenges

- Entry barrier of training program for teachers is very high.
- Teachers often want the hands-on techniques to use in their class tomorrow.
- Professional lecturers need to have the vision of K-12 SD/ST education.
Five Objectives

Beyond School

Academia

Within Schools

K-12 SD/ST Education

Contents

Provider
Content Strategy

- Phase 1: Game
- Phase 2: Group modeling of CLD
- Phase 3: Systems thinking from Stock & Flow
- Phase 4: Computer simulation modeling

Without software

Challenge
Game

World Climate Simulation
Your turn to negotiate

World Climate Ambassador

Prof. Chang Kwon (Benjamin) Chung

Professor Chang Kwon (Benjamin) Chung holds a Ph.D. in International Business Strategy and has 27 years of business experience. He is affiliated professor at the School of Business and Information Management and the Presidents of the Business and Management Systems Institute. He is the CEO of System Leader to facilitate the business learning system. He is also the co-founder and President of the International System Thinking Society. He has held several executive positions in various sectors of social government, private enterprises, and universities. He is a specialist in organization design and has collaborated with Social Measurement Institute.

The Shape of Change

Including: The Shape of Change: Stocks and Flows
By Rob Cross, Alan Tischler, and Debra Lynott
Illustrated by Nathan Walker

The Climate Change Playbook
22 Systems Thinking Games for More Effective Communications about Climate Change
DENNIS MEADOWS, LINDA EDEN, M.J. AKAN, AND GILLIAN MARTIN MEHLER
Game = \( f \left( Simulation + Systems \ Thinking + \alpha \right) \)
Game

- **Fun**
- **Surprise**
- **Involvement**
- **Reflection**
- **Motivation**

- Structure produces behavior.
- Partial optimization makes the whole system even worse.
- The decrease of net-inflow of pollution only increases the pollution stock.
- The delay is the cause of system’s counterintuitive behavior.

Mental model beneath the structure is critical, but the change of mental model is the big challenge, which we should care.
GBR Model  (Game-Based Reflection Model)

**GAME**
Priming water for systems thinking

**REFLECTION**
Understanding the structure
“Structure produces behavior.”
“Before you blame someone, you have to analyze the inevitable structures.”

**PLAY**
Discussion
The core of systems thinking with play and discussion

**APPLICATION**
Future Creation
Future new job to forecast and explore change

**RESEARCH**
Solution
Community problem solving through structure analysis

**Future Creation through Systems Thinking**
Five Objectives

Beyond School

Academia

K-12 SD/ST Education

Within Schools

Contents

Provider
GBR Model  (Game-Based Reflection Model)

The Korean Society of Environmental Education

ESD or Education for Sustainable Development meets SD/ST on 16 June 2018 for the first time in Korea.
Graduate course for Ph.D, Ed.D and Ed.M

“RESEARCH METHODS IN EDUCATIONAL POLICY”

First time in Korea
Spring semester, 2018
Poster presentation of students

Since 2016, Korean System Dynamics Society has actively hosted poster presentation of K-12 students.

Winter Annual Conference, 2016
Poster presentation of students

Since 2016, Korean System Dynamics Society has actively hosted poster presentation of K-12 students.

Winter Annual Conference, 2017
Poster presentation of students

Since 2016, Korean System Dynamics Society has actively hosted poster presentation of K-12 students.

Summer Annual Conference, 2017
Poster presentation of students

I have a dream with you.

International K-12 SD/ST Conference
Seoul, Korea
2018 CLE Conference Keynote Speech

Cambodia Case
Case Study of K-12 SD program in South Korea Applied by World Climate Focused on Environment Subject

Cambodia
Pioneer in Cambodia

Case Study of K-12 program in South Korea: any opportunity for Cambodia?

Email on 3 Nov. 2017
Pioneer in Cambodia

Prof. Veasna Kum, executive director of PIARD, an academic research center belonging to Pannasastra University of Cambodia

Ph.D. at University of Hawaii at Manoa
Economics, Environment, & System Dynamics

Prof. Forrester asked him for the K-12 SD/ST education in Cambodia, so K-12 SD/ST is one of his lifetime vision.
Pioneer in Cambodia

Case Study of K-12 program in South Korea: any opportunity for Cambodia?

He emailed me on 3 Nov. 2017

I visited on 1 Feb. 2018
First SD/ST workshop in Cambodia

Chang-Kwon Chung, Ph.D.
Seminar on Systems Thinking Education

When? February 1, 2018
2pm to 7pm
Where? PUC-South Campus
3rd Floor, Room: Phnom Chiso

Free Admission

Contact: Dr. Kum Veasna for more information
078.536.353
First SD/ST workshop with students in Cambodia

One day workshop in Salt and Light International School, Cambodia
One day workshop in Cambodia
One day workshop in Cambodia
One day workshop in Cambodia
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One day workshop in Cambodia
Implication of Cambodia case

Opportunities

- Find the pioneer.
- Believe in ‘Born Systems Thinker”
- No language problem if you find international school in your language.

Challenges

- Keep sustainability in education. One time event is not good.
- Prepare fund for sustainability.
- Water the seed of network and relationship.
Stick to the vision

Keep the reinforcing feedback intact.
Thank You!

Chang-Kwon Chung Ph.D.
( Benjamin)

benjamin@System-Leadership.org

Non-profit organization
System Leadership Institute