Smart Education
under Alphago Age

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PRESIDENT, Smart Education Society
2019 AERA ANNUAL MEETING | APRIL 5 - 9, 2019 | TORONTO, CANADA

Each year, the American Educational Research Association (AERA) Annual Meeting is the world’s largest gathering of education researchers and a showcase for groundbreaking, innovative studies in an array of areas. Join us at the Metro Toronto Convention Centre, April 5 - 9, 2019, for five rewarding days of ideas, engagement, networking, and professional advancement.

Quick Links: Entry Into Canada | FAQ | 2019 Print Program Files | Program Schedule
Leaving Toronto AERA 2019.

Aera is the largest association of educational researchers in the world. Aera 2019 celebrates its 100th anniversary this year. As said, Some about 25,000 researchers attended and around 100 even from Koreans in and out.

My impression is a sort of sorrow feeling somewhere in the lost world. Too luxuries of jargons and big discourses, struggling for searching the exit from the prisons of education.

Education is locked in. There must be an emergent exit out the education initiated in 2011 by Korean people was too early and showed a tiny slit. Renaissance of Korean education is an urgent task.
정상분포와 멱함수 분포, 당신은 어느 쪽에 속해 있습니까?
기초학력미달자란?
1. 모른다.
2. 20점 미만자.
3. 난이도 20% 이하 문제도 못 푸는 학생?

지능이란 것도 사실은....
1. 모른다.
2. 언어와 수학 점수일 뿐이다
3. 그것도 주로 영어....?
Does Education Really Matter?

Yes, It Does! See Korea!

Indeed, Since Human Civilization It Has Been: Egypt, Sumer, Hellenism, Islam and even to Anglo-Saxons……..

Education First by UN SDG.

However, We do not know how it really matters,……
Education

is the problem?

그들은 학교에 왔는가?
그들은 공부를 하는가?
Global Literacy Rates, Global Development Gaps
But, HOW?
Then in Korea......
Secrets of Korean Success

- Hangul by King Sejong.
- Historical assets of literary culture.
- Social demand of education known as the education fever.
- And Many other unknown secrets...

- One clue unknown: 홍익인간 (the maximum interests to human beings) as the national goal of education proclaimed.
There was one smart challenge, 2011 in Korea!
Definition of SMART Education

SMART Education aims to build an intelligent customized learning system for strengthening competencies of learners in the 21st century and to be a driving force for innovating educational system, including educational environment, content & methods, and assessment.

- S (Self-directed): (Self-initiated) (Past) curricular composition led by teachers 'Self-directed learning' planned and performed by students for themselves
- M (Motivated): (with fun) (Past) Lecture-type lesson using typical textbook 'Experience-based creative learning' using various activities & content
- A (Adaptive): (Levels & aptitude) (Past) Uniform lessons with 1 subject & single course 'Flexible & individualized learning' considering each student's level & aptitude
- T (Technology Embedded): (Using IT) (Past) Educational opportunities limited to classroom & home 'Technology-based learning' creating identical educational environment anytime anywhere
- R (Resource Enriched): (Rich resources) (Past) Paper textbook-centered education 'Rich educational content-centered learning' using digital content & online learning courses

- SMART
Progress of ICT in Education to Smart Education
But stopped soon, by politics !
By the way, what pedagogical implications do we have?

그런데, 왜 우리는 그동안 주춤했을까?

사실, 우리는 방법을 찾아왔으며, 조금씩 나가고 있는 중이다.
Some impossible mission?
“21st Century Skills”
Some possible dream? “New 3 Rs”
Before 21c:

Education = $F(\text{Literacy})$

= $F(\text{Reading, Writing, Reckoning})$

After 21c:

Education = $F(\text{21st skills})$

= $F(\text{Literacy, Numeracy, Diteracy})$
One Example: Myanmar Report on Education

British surprised at higher adult literacy in Myanmar than in London when they came in 1890s!

However,........
최초의 교과, 영원한 교과!
역사를 바꾼 위대한 교수법들!

Greek Chorus by Plato (Nomoi, 법률)

『법률』에서 절제는 시민교육의 목적이며 절제의 함양은 합창가무(chorus)와 전문 (prooimion)을 통한 설득으로 완성된다.

Havruta by Jews

공자왈, 글자를 배우라!
First encounter: Letter&Number
LOGOS

0
Tools of literacy

- Egyptian hieroglyphics
- Sumer cuneiform
- Chinese letters
- Roman alphabetics
Tools of Numeracy
Second encounter: Paper
history of paper

코란의 기적: 종이와의 만남, 그리고 사라센 과학의 공헌

실크로드, 종이의 전래

코란 최고본 (버밍엄대학)

지혜의 집 (아바스왕조)
Third encounter: Printing
인쇄술 발전에서 과학 혁명까지

구텐베르그
인쇄술

마르틴 루터
종교개혁

데카르트
이성의 발견

뉴우튼
과학 혁명
history of printing:
직지는 왜?

직지는 왜?
- 한자와 인쇄술
- 팔만대장경은 왜 목판?
- 한글은 왜?
Some late, but still a chance here
Now encounter: Computer & Smart Technology
Another shock after Sputnik, What direction for education?
Man Vs Machine
누가 이길 것인가?
Deep Learning by Machine ?
Slow Learning by Human ?
Pythagoras in the 'School of Athens'

- Father of mathematics

<table>
<thead>
<tr>
<th>Equation</th>
<th>Description</th>
<th>Year/Inventor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Pythagoras's Theorem</td>
<td>(a^2 + b^2 = c^2)</td>
</tr>
<tr>
<td>2.</td>
<td>Logarithms</td>
<td>(\log xy = \log x + \log y)</td>
</tr>
<tr>
<td>3.</td>
<td>Calculus</td>
<td>(\frac{df}{dt} = \lim_{h \to 0} \frac{f(t+h) - f(t)}{h})</td>
</tr>
<tr>
<td>4.</td>
<td>Law of Gravity</td>
<td>(F = G\frac{m_1 m_2}{r^2})</td>
</tr>
<tr>
<td>5.</td>
<td>The Square Root of Minus One</td>
<td>(i^2 = -1)</td>
</tr>
<tr>
<td>6.</td>
<td>Euler's Formula for Polyhedra</td>
<td>(V - E + F = 2)</td>
</tr>
<tr>
<td>7.</td>
<td>Normal Distribution</td>
<td>(\Psi(x) = \frac{1}{\sqrt{2\pi\sigma}} e^{-\frac{(x-\mu)^2}{2\sigma^2}})</td>
</tr>
<tr>
<td>8.</td>
<td>Wave Equation</td>
<td>(\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2})</td>
</tr>
<tr>
<td>9.</td>
<td>Fourier Transform</td>
<td>(f(x) = \int_{-\infty}^{\infty} f(x)e^{-2\pi i \omega x} , dx)</td>
</tr>
<tr>
<td>10.</td>
<td>Navier-Stokes Equation</td>
<td>(\rho \left( \frac{\partial \mathbf{v}}{\partial t} + \mathbf{v} \cdot \nabla \mathbf{v} \right) = -\nabla p + \nabla \cdot \mathbf{T} + f)</td>
</tr>
<tr>
<td>11.</td>
<td>Maxwell’s Equations</td>
<td>(\nabla \cdot \mathbf{E} = 0) (\nabla \times \mathbf{E} = -\frac{1}{c} \frac{\partial \mathbf{B}}{\partial t}) (\nabla \cdot \mathbf{H} = 0) (\nabla \times \mathbf{H} = \frac{1}{c} \frac{\partial \mathbf{E}}{\partial t})</td>
</tr>
<tr>
<td>12.</td>
<td>Second Law of Thermodynamics</td>
<td>(dS \geq 0)</td>
</tr>
<tr>
<td>13.</td>
<td>Relativity</td>
<td>(E = mc^2)</td>
</tr>
<tr>
<td>14.</td>
<td>Schrödinger’s Equation</td>
<td>(i\hbar \frac{\partial \Psi}{\partial t} = H \Psi)</td>
</tr>
<tr>
<td>15.</td>
<td>Information Theory</td>
<td>(H = -\sum p(x) \log p(x))</td>
</tr>
</tbody>
</table>
Gloomy Goals: Education vs Literacy
여전히 글과 수를 읽는 것은 어렵다.....

• Jomtien Decade started in 1990:
• From Literacy for All to Education for All by 2000
  (1990-2000 one decade), but delayed again.
• “universal access to basic education by 2015!”
  in 2000 at Dakar WEF.
• Incheon Declaration in 2015 for Global Citizenship Education.
• Six-year basic primary education seems to have reached
  at least in reports by 2015.
• However, 1 in 5 of world population are still illiterate,
  2/3 are women.
학습 혁명은 무엇을 말하는가?
학습혁명이란.....
학습이 쉬운 일이 되는 것이며,
학습이 모두의 것이 되어야한다.
More People Have Cell Phones Than Toilets, U.N. Study Shows

Out of the world’s estimated 7 billion people, 6 billion have access to mobile phones. Only 4.5 billion have access to working toilets.

By Yue Wang | March 25, 2013

On the eve of World Water Day last week, the U.N. offered a sobering statistic: according to its recent study, more people on earth have access to cell phones than toilets.

Out of the world’s estimated 7 billion people, 6 billion have access to mobile phones. Far fewer — only 4.5 billion people — have access to working toilets. Of the 2.5 billion who don’t have proper sanitation, 1.1 billion defecate in the open, according to the study.
Full 16 Frame Scratch Cat Walk Cycle
by griffpatch

- when clicked
- when space key pressed
- when this sprite clicked
- when backdrop switches to
- when loudness
- when I receive message1
- broadcast message1
- broadcast message1 and wait

- set size to 50%
- go to x: -195 y: -123
- clear
- switch costume to Walk1
- repeat 8
- stamp
- change x by 33
- next costume
- set size to 120%
- go to x: 0 y: 59
If you have some limited money, which do you choose now for global citizenship building; building a school or giving a smartphone?

I will give them smartphone.
첫번째 코드: 책 Book
두번째 코드: 컴퓨터

코드: 스마트교육미디어 →

제1코드: 책
   - 코드1.1 말
   - 코드1.2 글
   - 코드1.3 수
   - 코드1.4 종이
   - 코드1.5 인쇄출

제2코드: 컴퓨터
   - 코드2.1 비트
   - 코드2.2 칩
   - 코드2.3 디스플레이
   - 코드2.4 통신
   - 코드2.5 코드
언수사과음미체

7자유학과/사서삼경

언수사과음미체

9 스마트역량