ICT in education: Korean experience

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Success Story: The “Miracle of Han River”

<table>
<thead>
<tr>
<th>Year</th>
<th>GNP per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>US$67</td>
</tr>
<tr>
<td>1980</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>US$24,000</td>
</tr>
</tbody>
</table>

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**Success Story: The “Miracle of Han River”**

Korea is 9th nation w/ US$1 trillion in export

Korea is 7th in GDP pc US$20,000 & 50M pop

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**Key to success is: Education**

From one of the poorest nations to one of the most dynamic economies. This change in just one generation.

**NATIONAL CONSENSUS** on the importance of education **PARENTAL WILLINGNESS** to invest in the future of children
Success Story: The “Miracle of Han River”

By land size (km²)

<table>
<thead>
<tr>
<th>Country</th>
<th>Land Size (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iceland</td>
<td>103,000</td>
</tr>
<tr>
<td>South Korea</td>
<td>109,210 (92,049)</td>
</tr>
<tr>
<td>Hungary</td>
<td>93,628 (95,919)</td>
</tr>
<tr>
<td>Portugal</td>
<td>92,698 (30,569)</td>
</tr>
<tr>
<td>Jordan</td>
<td>89,542 (34,895)</td>
</tr>
<tr>
<td>Serbia</td>
<td>88,361 (34,116)</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>56,600 (53,493)</td>
</tr>
<tr>
<td>Andorra</td>
<td>52,871 (52,361)</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>52,309</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>78,865 (50,459)</td>
</tr>
<tr>
<td>Panama</td>
<td>75,417 (50,119)</td>
</tr>
</tbody>
</table>

By population

<table>
<thead>
<tr>
<th>Country</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italy</td>
<td>58,317,507</td>
</tr>
<tr>
<td>Benin</td>
<td>53,259,000</td>
</tr>
<tr>
<td>South Africa</td>
<td>52,981,991</td>
</tr>
<tr>
<td>South Korea</td>
<td>50,219,666</td>
</tr>
<tr>
<td>Colombia</td>
<td>47,450,000</td>
</tr>
<tr>
<td>Spain</td>
<td>46,784,314</td>
</tr>
<tr>
<td>Ukraine</td>
<td>45,430,022</td>
</tr>
<tr>
<td>Tanzania</td>
<td>44,628,923</td>
</tr>
<tr>
<td>Kenya</td>
<td>44,354,000</td>
</tr>
<tr>
<td>Argentina</td>
<td>40,117,006</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>8,564,770</td>
</tr>
</tbody>
</table>

People are her only ‘natural resource’

Key to success is: Education

3W learning

Whenever
Wherever
Whoever
Key to success is: Education

3S learning

Key to success is: Education

3S learning

11,000 schools
483,000 teachers
199 four-yr. colleges
132 two-yr. colleges

1945

1960

1980

2000

2020

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Key to success is: Education

3S learning
100% attend K-6
99.8% move onto 7-9
99.6% move onto 10-12
97.9% literacy rate

Key to success is: Education
No. of students per teacher
Low birth rate

1960 1980 2000 2020
Key to success is: Education

3W learning  3S learning

2013 PISA result:
(Program for Int’l Student Assessment)
Korea is the best among 34 OECD nations in Math, Science and Reading

MATH Rank
1. Korea
2. Japan
3. Switzerland
4. Estonia
5. Finland
6. Canada
7. Poland
8. Belgium
9. Germany
10. Austria
11. Australia
12. Ireland
13. Slovenia
14. Denmark
15. New Zealand
16. Czech Republic
17. France
18. United Kingdom
19. Iceland
20. Luxembourg

Whenver  Whenever
Wherever  Wherever
Whoever  Whoever

Same time  Same time
Same place  Same place
Same age  Same age

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e-learning (ICT 1.0)

Internet
Computer
TV & AV

Helps to show Complexity
e-learning (ICT 1.0)

Helps to explain difficult concepts

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smart media (ICT 2.0)

It's mobile and ubiquitous.

smart media (ICT 2.0) is a great enabler!

Accessibility
Social impact

20 yrs in class 2 wk online 1 yr online
4,000 students 4,000 40,000
smart media (ICT 2.0)

Smartphone penetration rate
(Global average: 14.8%, base: 2012)

Korea had the highest smartphone ownership in the world last year.

Percent of South Korean Students Owning Smartphones
Source: Ministry of Education Survey released July 29, 2013

<table>
<thead>
<tr>
<th>Regional category</th>
<th>Elementary</th>
<th>Middle School</th>
<th>High School</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>City</td>
<td>49.2</td>
<td>85.4</td>
<td>83.7</td>
<td>69.6</td>
</tr>
<tr>
<td>Rural (farming/fishing villages)</td>
<td>46.6</td>
<td>83.1</td>
<td>83.7</td>
<td>66.5</td>
</tr>
</tbody>
</table>

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smart media (ICT 2.0)

5 TV channels dedicated to learning

- General audience
- Elementary school children
- Middle school students
- College preparatory
- English Education
e-learning (ICT 1.0)

ICT 1.0 is obsolete!

Key to success is: Education

3W learning 3S learning 3A learning

1960 1980 2000 2020

Whenever Wherever Whoever
Same time Same place Same age
Anytime Anywhere Anyone
### Key to success is: Education

<table>
<thead>
<tr>
<th>3W learning</th>
<th>3S learning</th>
<th>3A learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>132</td>
<td>32</td>
<td>63</td>
</tr>
</tbody>
</table>

As of 2013, schools with...

<table>
<thead>
<tr>
<th>Internet, computers</th>
<th>~100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic board, beamprojection</td>
<td>45.6</td>
</tr>
<tr>
<td>Classroom recording system</td>
<td>9.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tablet PC</th>
<th>2007 Digital textbook exp. Sch.</th>
<th>Anytime</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2011 Smart science exp. Sch.</td>
<td>Anytime</td>
</tr>
<tr>
<td></td>
<td>2012 Mode Digital textbook Sch.</td>
<td>Anytime</td>
</tr>
</tbody>
</table>

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Proficiency in problem solving in technology-rich environments

Young adults (16-24 year-olds)

Korea
Finland
Sweden
Netherlands
Flanders (Belgium)
Norway
Czech Republic
Germany
Canada
Average
Austria
Australia
Estonia
Denmark
Japan
England/NW (UK)
Slovak Republic
Ireland
Poland
United States

Older adults (55-65 year-olds)

Korea
Finland
Sweden
Netherlands
Flanders (Belgium)
Norway
Czech Republic
Germany
Canada
Average
Austria
Australia
Estonia
Denmark
Japan
England/NW (UK)
Slovak Republic
Ireland
Poland
United States
"ICT in education" is more than about teaching kids with technology. It's about building future society now.

"ICT in education" is about promoting 'lifelong learning' & creating a 'learning society'.

Proficiency in problem solving in technology-rich environments

DRA and PRA, OECD 2009

OECD avg. 499
‘ICT in education’ in Korea helps achieve educational equity and parity.

Diff. is 88 pts.

Diff. is 120 pts.

Korea

OCED avg.

25 %

75 %

OECD avg. 499

 ICT in education’ in Korea helps achieve educational equity and parity.

Diff. is 88 pts.

Diff. is 120 pts.

Korea

OCED avg.

25 %

75 %

OECD avg. 499

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Obama Praises Korean Education Again

U.S. President Barak Obama has lauded South Korea, again, to encourage Americans to do more on the educational front.

In a speech he delivered in Las Vegas on Friday, he said America cannot succeed in science if India and South Korea produce more scientists and engineers.

In March last year, only one month into his assuming president, for example, he called for the United States to look to South Korea in adopting longer school days and after-school programs for American children to help them survive in an era of keen global competition.
How can the teachers uncustomed to technology can educate students to become technology-savy?

TEACHER (RE)TRAINING every year 25% of teachers attend workshops on ICT in educ.

Key to success is: Leapfrogging

1. **ICT in Classroom**

   We must embrace technology and integrate it into our education

   We no longer need to invest heavily in building “traditional schools.” Instead, invest in ICT.

   Technology is expensive, but cheaper than building schools.
The **dumbest use** of smart media

Just do it. No questions asked!
Don’t even think about it!

Doing the same more & faster!

Just more & faster
Doing the same more & faster!

Oh, God. He says only one word...“next, next”

Just more & faster

ICT 2.0
ICT
CBT
IBT
TEL

The most advanced form of smart media reinforcing the worst form of teaching.

What good is smart media if... all it does is do the bad education more and faster?

‘ICT in classroom’ must be accompanied by ‘Reform in Teacher Ed’

(Emphasis on the hardware aspect of ICT is not good enough.)
The role of teacher needs to change!

Before

Now

"Sage on the stage"

“Guide on the side”

Passive
Unidirectional
Info transfer and reception
Teaching centered

Active
Interactive
Integrative & contextualized
Learning centered

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The role of teacher needs to change!

We must embrace technology and integrate it into our education.

‘ICT in classroom’ must be accompanied by teacher training.

Teachers must be trained to plan, create, and deliver instruction within an electronically-mediated environment.

Teachers must be trained to be proficient in both on-line and off-line instructional situation.

The role of teacher needs to change!

We must embrace technology and integrate it into our education.

‘ICT in classroom’ must be accompanied by teacher training.

BUT, before adding more training on ICT, must make room by subtracting or minimizing obsolete practices.

Design methods, perspectives and values must change.
The role of teacher needs to change!

1. ICT In Classroom

2. Reform in Teacher Ed

3. Reform in Teacher Ed

4. ICT in classroom’ must be accompanied by teacher training.

We must embrace technology and integrate it into our education

‘ICT in classroom’ must be accompanied by teacher training.

Use ICT in the training of teachers!

What is school? “My teacher has changed!”
Continue doing the same thing... I’d rather quit.

Were it about money, I’d leave the profession.
What is school? “My teacher has changed!”

Smart use of smart media in education.

- the teacher
- Focus on the board
- Individual student reaction
- Entire classroom
A top-rated EBS TV documentary

Before video feedback...

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Before video feedback...

After video feedback...

*Is that Korea before the war?* ... Yes.
I really look forward to next year. (Hope!)

Now that I’ve found myself, I am happy.

Smart use of smart media in education.
Smart media can be a **change agent**

- Nat. Assoc. of Education Consulting was founded.
- Recently instituted Master Teachers are charged with training other teachers.
- An army of “consultant teacher” trained.

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Smart media (ICT) in education: Is it a blessing or a curse?

1. ICT in Classroom
2. Reform in Teacher Ed
3. Curricular Reform
4. Leadership In Education

We must embrace technology and integrate it into our education

‘ICT in classroom’ must be accompanied by teacher training and reform in teacher preparation

‘ICT in classroom’... what for???
World according to creativity (IP)

Creators of ICT

Consumers of ICT

Korea is a powerhouse in IP activities
Korea’s rise is a recent phenomena

Figure A.2.1.2 Trend in patent applications for the top five offices

A Korean experiment

Every year, 160 middle and high school students are selected for a two-year program at KAIST & POSTECH. Maintains an on-going number of 320 students.

Not with the best grades or IQ, but with high motivation and creativity!
A Korean experiment

Offline (3S) education
- It runs once every six weeks during the academic term and for two weeks during vacations.
- Group Projects: Students create intellectual properties based on high tech and business models.
- Mentoring: Students meet with famous entrepreneurs and CEO’s to sustain their dreams and vision.

Allowed creativity
Fostered teamwork

Want to be a CEO? Then, act like one.

Online (3A) education
- Lectures:
  • Future technology, Fusion of knowledge
  • Intellectual Property Rights
  • Entrepreneurship, virtual company administration
- Activities:
  • Students manage personal blogs, SNS communities
  • Students engage in online debates and discussions
A Korean experiment

Result...for year 2012...

369 patents applied
5 companies started
by junior and high schools students!

Blessing?

World TOP in technological proficiency & academic achievements

1. Korea
2.
3. Switzerland
4. Estonia
5. Finland
6. Canada
7. Poland

Curse?

Dead LAST in student happiness

Percentage of students who reported being happy at school

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School dropout  
Cyber bulling  
Game addiction  

Curse?

Dead LAST in student happiness

Importance of emotion

Learning is emotion based!

ICT needs to address learning, motivation, & creation

ICT needs to connect to emotional level.
Doing the same more & faster!

ICT 2.0
ICT
CBT
IBT
TEL

Cognitive domain
"slack"
basic knowledge
fuzzy thinking
positive mindset
curiosity
adventure
blind trust in 'the' answer

Fear of failure
The answer
Fuzzy thinking
curiosity
adventure

Affective domain

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We need to focus on both aspects of e-learning:

- electronics
- hardware
- technology
- empowerment
- emotion
- software
- heart
- experience
e-learning:

- electronics
- hardware
- technology
- empowerment

emotion
software
heart
experience

ACCESSIBILITY & CONNECTIVITY

to
information
&
knowledge

between
teachers
&
students

ICT need not be confined to the traditional connection between information and people via AV and computers in the classroom.

It can be connection between mind and body.
ICT for connectivity to emotion

Classroom Dynamics
The Incoherent Teacher/Classroom

In Sync: Improved Thinking

HeartMath
Smart media (ICT) in education: Is it a blessing or a curse?

1. ICT in Classroom
2. Reform in Teacher Ed
3. Curricular Reform
4. Leadership In Education

It is a curse if ICT is considered a supplement to the traditional curriculum

But a blessing if it is used as an opportunity to reform and innovate the existing curriculum.

It depends on whether we have ‘LEADERSHIP’ in education

**PRIORITY**

(Values, Political will)
Decision was made by leaders 50 years ago…

Build national consensus
Education as dream-making
Success through technology
Teachers are Nation Builders

Whether to make the change or not