















Source: Korea University

Consolidating 4IR Policy Toward Sustainable Development: Addressing Educational Challenges in an Age of Rapid Technological & Global Change

	First Industrial Revolution	Fourth Industrial Revolution
Learning Objectives	Mastery of basic skills and knowledge (e.g., reading, math) 	Development of whole person across multiple intelligences (e.g., emotional, intellectual, social) 
Role of Educator	Expert 	Facilitator 
Learner Experience	'Factory model' - Passive, structured, directed, en masse 	'Custom model' - Active, self-directed, exploratory 
Target Age	K-12 	Lifelong learning 
Expertise	"Teacher knows best" 	"Anyone can teach" 
Access	Physical classroom 	Anytime, anywhere, any device 

Source: Awaken Group

Presentation to:
World Knowledge Forum
Keith Rabin, KWR International
Seoul • October, 2018

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What role will education play in the Fourth Industrial Revolution?



“Traditional education has contributed greatly to the current levels of industrial evolution and technological advancement. However ... for higher education to deliver future generations with the right set of skills and knowledge; an imperative question has to be asked regarding how higher education institutes would be affected by the Fourth Industrial Revolution and how the delivery of education will be transformed.” Asmaa AbuMezied, Research and Advancement Fellow, Internet 2 for World Economic Forum

“Yes, the education issue is important, especially the issue of using and applying technologies for hands-on, experimental education for the students. Students' attention time is very short nowadays, and the way we used to learn from our school time (inputting knowledge) is no longer working for these kids. They can get the knowledge easily and in real time from their smartphones. They need more simulations and experiments to get the feelings of the essence of the issues and theories, so that they can apply creatively on any fast-changing environment for their future career. What they learn from the school will be immediately obsolete after their graduation.” Dr. Sang Hoon Lee, Director of DBA Program, Bang School of Business, KIMEP, Kazakhstan

4IR – Policy Review/Coordination Urgently Needed to Address Rapid Change

- Rapid innovation and global/sectoral integration challenge and disrupt traditional economic models, social dynamics and norms.
- E-mail-1971, Browser-1993, Genome Map-2001, Facebook-2004, iPhone-2007, What will we see next 10-20 years?

Membership of the 115th Congress: A Profile

- Change only likely to accelerate even more rapidly moving forward.
- Urgent need to review/advance/adjust domestic/multilateral policy/institutions during increasingly populist times.

Table 1. Average Age of Members, 112th-115th Congresses

Average (mean) age at the beginning of the Congress

Congress	Representatives	Newly Elected Representatives	Senators	Newly Elected Senators
115 th	57.8 years	50.8 years	61.8 years	54.8 years
114 th	57.0 years	52.3 years	61.0 years	50.7 years
113 th	57.0 years	49.2 years	62.0 years	53.0 years
112 th	56.7 years	48.2 years	62.2 years	52.1 years

Source: CRS calculations based on CQ, "115th Congress: Birthdays," <http://www.cq.com/members/factilereport.do?report=mff-birthdays>.

Notes: Representatives' age data do not include the Delegates and the Resident Commissioner. Newly elected Members data do not include those returning to the House or Senate for a second time.

Congressional Research Service

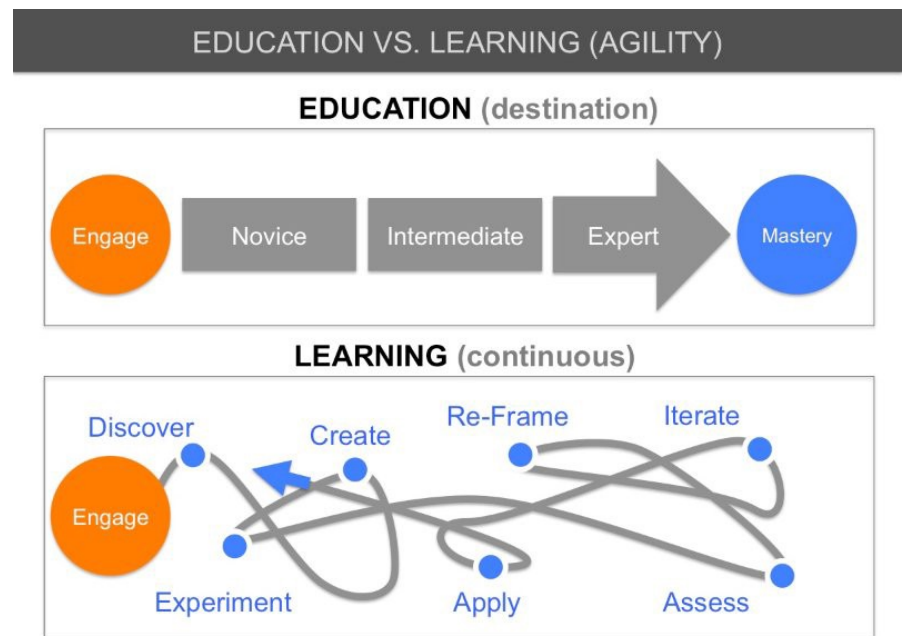
- Need to address global paradigm shifts in both developed as well as emerging/frontier economies – where change is more rapid/dynamic!
- Less time to reflect and allow reasoned analysis even if unhampered by partisan/national interests. Are leaders up to the task?

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4IR – Challenges to Education & Policy

“The notion of education implies ... there’s a path towards a definitive, finished state wherein an individual has become ‘educated.’ But in a world of accelerated change, with rapid disruption cycles ... that end state of being ‘educated’ is just no longer meaningful. An individual must have learning agility—the ability to learn, adapt, and apply in quick cycles”—Heather McGowan, January 2016

- Education vs Learning
- Creativity vs Specialization
- Degree/Skills Obsolescence
- Traditional vs MOOC
- Cost, Inequality & ROI
- Nat. Identity/Network/Socialization
- Immigration and Knowledge Transfer
- Digitization and IPR Issues



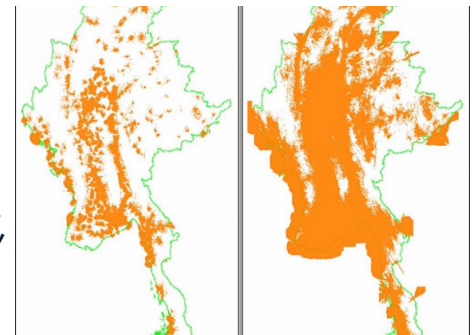
@heathermcgowan

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4IR–Challenges: Developed vs Developing?

“Since Myanmar’s telecoms revolution began in 2014, the number of Internet users has risen from 2 million to more than 39 million, while the number of SIM cards in circulation has risen by almost 400 percent according to government figures.” — Myanmar Times, April 2016

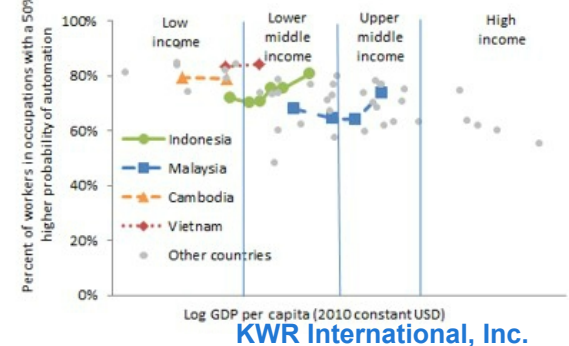
- Pace of Change in Developing Countries far more rapid and possibly even more impactful than Developed Economies – arguably even compared to Korea’s own rapid development!. Disruption and rising living standard, however, result in major opportunities for transformation and growth!
- Shift from Export to Consumption Model of Development
- Supply Chain/Strategy Changes & Effect of Automation
- Lack of Social Safety Net/Institutions to deal with intense disruption/change & search for answers how to address
- Local Educational Resources vs “Brain Drain” and Cost
- Global Economic Integration and Competition



**Myanmar Cell Phone Penetration
Sept 2014 vs Mar 2016**

Source: MPT

Figure 4. Percent of workers by country whose occupations have a 50% or higher probability of automation as estimated by Frey & Osborne 2013



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4IR – Education as Essential Driver and Component of Economic Competitiveness!

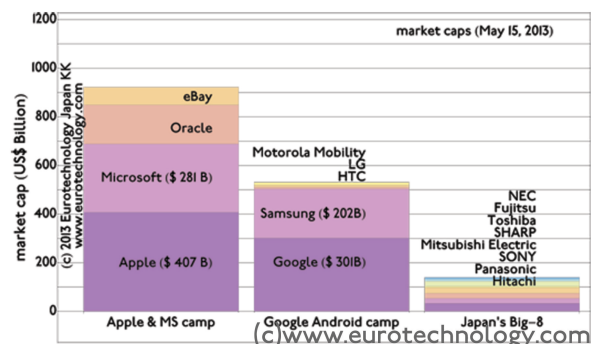
“Japan’s cell phones are like the endemic species ... Darwin encountered on the Galapagos Islands: fantastically evolved and divergent from their mainland cousins”
 Takeshi Natsuno, Keio University, NY Times, July 2009

“A couple of years ago, the fraction of the manufacturing workforce that had a college education or more exceeded those without for the first time in that sector. And it's grown ... the fraction of manufacturing workers with college degrees, 43 percent in the last decade alone. One in three of those jobs ... require STEM education ... I don't think the transformation that is happening in this country is well understood. Dr. Patrick Gallagher, Under Secy of Commerce for Standards & Technology & NIST Director, June 2012

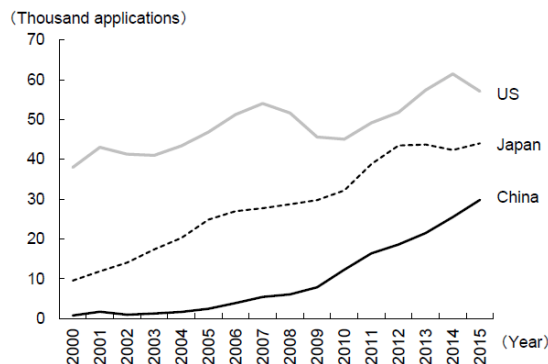
“... the (Chinese) government is seeking to transform the country's economic development pattern from one based on expansion labor input to one based on productivity growth by pursuing ‘the strategy of innovation-driven development’.” Chi Hung Kwan, REITI, January 2017



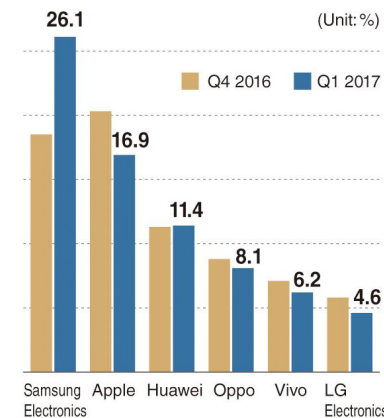
Comparative Market Caps 2013



Changes in International Patent Applications - REITI



World smartphone market share



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4IR – Macro Conclusions for Education Policy

“Your Education Today is your Economy Tomorrow” Andreas Schleicher, OECD

“The skills that are easiest to teach and test are also the skills that are easiest to digitize, automate and outsource.” Andreas Schleicher, OECD

“There is no future without investment in education.” Andreas Schleicher, OECD

- Pursue Development of Versatilists rather than Generalists
- Specialization important-but so is Big Picture, Critical Thinking, Context & Integration
- Encourage Independent Thinking/Diversity/Creativity w/in Collaborative Structures
- Balance Global Interdependency/Sensitivity without Losing National Identity
- Education is a Lifelong Process – Traditional Degrees, Training, MOCC and More
- Education Should not be Elitist–Invest in Public Education for Social Mobility
- Enhance Pub-Priv Cooperation/Commercialization/Training and Basic Research
- Set Curriculum Goals/Objectives while Empowering Teachers to Achieve Them
- Elevate/Invest in Teachers and Skills Development Rather than Facilities and Admin.

4IR–Education is Key Component of Korea’s International & Domestic Competitiveness

Korean education is good in teaching/delivering advanced knowledge to students eager to top others while struggling among severe competition. In general, they are good in STEM However, I would say they are not as effectively responding as their peers in America/Europe to unstructured settings due possibly to lack of creativity/imagination. Korean Educator

- Flexible/Lifelong/Supplemental Approach to Education
 - Supplement Degrees w/Specialized/Vocational/MOCC/Corp/Lifelong Training
- One Size Does Not Fit All – Importance of Relative vs Absolute Evaluation
 - Encourage Diversity & Specialization through Evaluation Beyond National Exam
- National & Local; Creative & Technical; Pub/Priv, Executives & Entrepreneurs
 - Continue Shift to Competency-based Society w/Lifelong Training, ie National Competency Standards & Work-Learning Dual System
- Hardware & Software: Intelligent Network/5G, Bring Your Own Device, etc.
- Education to Enhance Korean Economy & International Presence
 - Intl Cooperation, Global Citizen Education, ODA, Research & Exchanges
 - K-Pop Provides Tool to Build on International Interest in Korean Culture

Thank you / Q&A

Keith Rabin, President
KWR International, Inc.
KWR International (Asia) Pte. Ltd.
krabin@kwrintl.com