

Innovation Skills for Job Creation

VEERAPPAN SWAMINATHAN

CEO, EDM8KER | VEERA@EDM8KER.COM



Group of business students showcasing an IoT-enabled bicycle parking station developed over 48 hours at NTU ideasinc event.

Covid-19 is accelerating transition

Why COVID-19 Is Accelerating the Future of Gender Equity



Katica Roy [Follow](#)
Apr 20 · 5 min read

Source: <https://medium.com/@katicaroy/why-covid-19-is-accelerating-the-future-of-gender-equity-b9daae900a4>

Covid-19: Accelerating digitalisation

Friday 10 April 2020

According to the port of Gothenburg in Sweden, the coronavirus outbreak could accelerate digitalisation in what is an otherwise conservative shipping industry.

Source: <https://www.heavyliftpf.com/news/covid-19-accelerating-digitalisation/>

COVID-19 ACCELERATING PHYSICIANS' ADOPTION OF TELEHEALTH AND CHANGING PRESCRIBING PRACTICES SAYS NEW SURVEY FROM ABELSONTAYLOR

Source: <https://www.pharmalive.com/covid-19-accelerating-physicians-adoption-of-telehealth-and-changing-prescribing-practices-says-new-survey-from-abelsontaylor/>

Opinion **Technology sector**

How Covid-19 is accelerating the shift from transport to teleport

We are fast moving to a world where more economic activity takes form

Source: <https://www.ft.com/content/050ea832-7268-11ea-95fe-fcd274e920ca>

Covid-19 Accelerating Energy Transition, Study Suggests

📅 17th April 2020 👤 jburke

Source: <https://dieselgasturbine.com/covid-19-accelerating-energy-transition-study-suggests/>

Commentary: The COVID-19 pandemic will accelerate a shift to digital payments

More than half of people in developed economies believe that cash will always be around, but COVID-19 may change this, say observers.

Source: <https://www.channelnewsasia.com/news/commentary/coronavirus-covid-19-digital-payment-cash-infect-china-europe-us-12583302>

How do we transform our young people from job seekers into job creators in a technologically driven world?

CLEARLY, WE SHOULD FOCUS ON MINDSET AND SKILLSET DEVELOPMENT... BUT HOW TO MAKE IT COHERENT?

3 Key Questions

1. What mindsets/skillsets help to support job creation?
2. How do we bring skills development to the broad base of students (who tend to be non-technical)?
3. How do we leave in a place a system that will self-correct for the future?

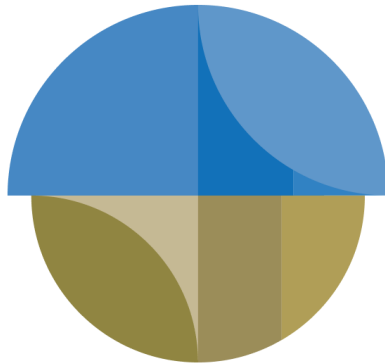
Strategic to focus on Innovation & Higher Order Thinking Skills



Job landscape

By 2025, new jobs will emerge and others will be displaced by a shift in the division of labour between humans and machines, affecting:

97 million



85 million

Growing job demand:

1. Data Analysts and Scientists
2. AI and Machine Learning Specialists
3. Big Data Specialists
4. Digital Marketing and Strategy Specialists
5. Process Automation Specialists
6. Business Development Professionals
7. Digital Transformation Specialists
8. Information Security Analysts
9. Software and Applications Developers
10. Internet of Things Specialists

Decreasing job demand:

1. Data Entry Clerks
2. Administrative and Executive Secretaries
3. Accounting, Bookkeeping and Payroll Clerks
4. Accountants and Auditors
5. Assembly and Factory Workers
6. Business Services and Administration Managers
7. Client Information and Customer Service Workers
8. General and Operations Managers
9. Mechanics and Machinery Repairers
10. Material-Recording and Stock-Keeping Clerks





Source: Future of Jobs Report 2020, World Economic Forum.



Top 10 skills of 2025

-  Analytical thinking and innovation
-  Active learning and learning strategies
-  Complex problem-solving
-  Critical thinking and analysis
-  Creativity, originality and initiative
-  Leadership and social influence
-  Technology use, monitoring and control
-  Technology design and programming
-  Resilience, stress tolerance and flexibility
-  Reasoning, problem-solving and ideation

Type of skill

-  Problem-solving
-  Self-management
-  Working with people
-  Technology use and development

Source: Future of Jobs Report 2020, World Economic Forum.

Framing Innovation & Higher Order Thinking Skills



Source: Singapore Ministry of Education

- **Social Emotional Skills**
- **Innovation Mindsets**
 - *Design Thinking, Computational Thinking, Systems Thinking, Futures Thinking etc.*
- **Technology Skillsets**
 - *Data Science, Modelling, Simulation, Machine Learning, Programming etc.*

3 Key Questions

1. What mindsets/skillsets help to support job creation?
2. How do we bring skills development to the broad base of students (who tend to be non-technical)?
3. How do we leave in a place a system that will self-correct for the future?

Combine Skills Learning with Real World Applications

Applied Learning Programme (ALP): A Possible Enactment of Achieving Authentic Learning in Singapore Schools

Low June Meng

National Institute of Education/Nanyang Technological University (Singapore) & Teachers' College/Columbia University (USA)

junemeng.low@ri.edu.sg

ABSTRACT: As a response to global challenges and the need to equip its citizens with 21st century competencies, the Ministry of Education (Singapore) (MOE) announced two key programmes to enable the acquisition of these key attributes. One of them, Applied Learning Programme (ALP), serves to enable authentic learning achievement by introducing 'real world' skills to the students in Singapore schools. Having been informed by theories that surround the notion of authentic assessment and authentic learning, this paper attempts to apply these theories to the discussion on ALP, using the concept known as Work-integrated Learning (WIL) as a possible ALP reference point. Implications of its enactment, including the intractability of assessing values and desirable attributes and its impact on the traditional role of the teacher are also discussed in this paper. While the author agrees that ALP holds promise in achieving authentic achievements as a long term and sustainable form of learning that can positively influence student learning, equip students with 21st century competencies and ensure positive future outcomes, there is a need for greater scholarship discourse in the area of authentic assessment and authentic achievement and their roles in the enactment of ALP.

Source: National Institute of Education, Singapore

- Rolled out in all secondary schools in 2017.
- Rolled out in all primary schools by 2023.

Embedded Electronics and Robotics eWater Sensors & Water Technology

1. Advance Robotic Arm



Watch video here:



Or: <http://tiny.cc/STEMProj-K1>

2. Biped Robot



Watch video here:



Or: <http://tiny.cc/STEMProj-K2>

3. Intelligent Home Automation



Watch video here:



Or: <http://tiny.cc/STEMProj-K3>

Curriculum Specialist Mr Kenny Phay

8

Source: Science Centre Singapore

Food Science & Technology Applied Health Sciences

1. Raceable Tech



Watch video here:



Or: <http://tiny.cc/STEMProj-M1>

2. Smart Fitness Stations



Watch video here:



Or: <http://tiny.cc/STEMProj-M2>

3. Beverage Dispenser (Arduino)



Watch video here:



Or: <http://tiny.cc/STEMProj-M3>

Curriculum Specialist Dr Tan Mui Hua

11

3 Key Questions

1. What mindsets/skillsets help to support job creation?
2. How do we bring skills development to the broad base of students (who tend to be non-technical)?
3. How do we leave in a place a system that will self-correct for the future?

Create a culture of lifelong learning through policy & action



Source: Civil Service College and Ministry of Manpower, Singapore

SkillsFuture

Your Skills. Your Asset. Your Future.

Programmes you can look forward to under SkillsFuture

| | | | |
|---|---|--|--|
| EDUCATION AND CAREER GUIDANCE (ECG) Counsellors to help students make well-informed decisions on education, training and careers. | SKILLSFUTURE EARN AND LEARN PROGRAMME Placement with structured on-the-job and institution-based training to give fresh ITE and polytechnic graduates a career headstart in chosen sectors. | SKILLS-FOCUSED MODULAR COURSES Wider range and scale of short skills-focused modular courses relevant to industry needs. | SECTORAL MANPOWER PLANS Developing pipeline of skilled workers. Progression and development framework to provide every worker with career pathways based on skills. |
| ENHANCED INTERNSHIP Structured programmes and enhanced internships will better support career exploration and workplace learning. | SKILLSFUTURE CREDIT Learning credits for all Singaporeans aged 25 years and above to pay for course fees for work-skills-related courses supported by public agencies. | SKILLSFUTURE STUDY AWARDS Monetary awards to help individuals develop and deepen their skills in growth clusters. | SKILLSFUTURE LEADERSHIP DEVELOPMENT INITIATIVE Funding to support increased collaboration with companies to develop and stretch high-potential talent. |
| YOUNG TALENT PROGRAMME (YTP) More overseas market immersion opportunities for ITE, polytechnic and university students. | | INCREASED COURSE SUBSIDIES All Singaporeans aged 40 years and above to receive a minimum of 90% course subsidy for MOE-funded and WDA-supported courses. | SKILLSFUTURE MENTORS SMEs can access pool of mentors with deep industry skills and experience to provide guidance in their implementation of skills deepening initiatives. |
| INDIVIDUAL LEARNING PORTFOLIO An online, one-stop education, training and career guidance portal for every Singaporean to plan their education, training and career path. | | SKILLSFUTURE FELLOWSHIPS Cash sponsorship for individuals with deep skills expertise to achieve mastery in their respective fields. | SKILLSFUTURE CREDIT Regular top-ups in learning credits for all Singaporeans to support skills deepening. |

In School **Starting Work** **Growing your Career**

STUDENTS, PARENTS & TEACHERS INDIVIDUALS EMPLOYEES EMPLOYERS GOVERNMENT EDUCATION & TRAINING INSTITUTIONS UNIONS & INDUSTRY ASSOCIATIONS

For more info, visit www.skillsfuture.sg

Putting it all together

- Involve Whole-of-System – Education Policymakers, School Leaders and Teachers.
- When it comes to change, supplement first. Then perhaps, supplant.
- These approaches have been embedded into the Intel® Skills For Innovation program.