



**STEM Applied Learning Programme – The Singapore Model**



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### **Mr. ONG Yao Teck, Chester**



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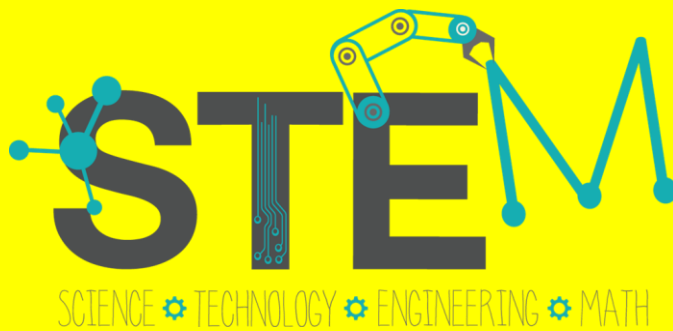
#### **STEM Applied Learning Programme – The Singapore Model**

Back in 2014, Prime Minister Lee shared his vision of a Smart Nation as the country's economy becomes increasingly technology-driven. Our capacity to fulfil the vision depends on the skills of our people in Science, Technology, Engineering and Mathematics (STEM).

The Ministry of Education then partnered STEM Inc, a newly-established unit under the Science Centre Singapore, to support schools in developing and implementing quality STEM Applied Learning Programmes (ALP). This is coupled with the Industrial Partnership Programme (IPP) where students get inspired by STEM professionals through interactions with them.

Manager, STEM Inc, Science Centre Singapore, Singapore Find out what makes STEM Education in Singapore tick and how STEM Inc continues to evolve to meet changing needs of the schools.

**STEM  
STEAM  
STREAM  
SCREAM  
EDUCATION**



# 2015 PISA AVERAGE SCORES

Math		Reading		Science	
Singapore	564	Singapore	535	Singapore	556
Hong Kong	548	Hong Kong	527	Japan	538
Macao	544	Canada	527	Estonia	534
Taiwan	542	Finland	526	Chinese Taipei	532
Japan	532	Ireland	521	Finland	531
China*	531	Estonia	519	Macao	529
Korea	524	Korea	517	Canada	528
Switzerland	521	Japan	516	Viet Nam	525
Estonia	520	Norway	513	Hong Kong	523
Canada	516	New Zealand	509	China*	518
Netherlands	512	Germany	509	Korea	516
Denmark	511	Macao	509	New Zealand	513
Finland	511	Poland	506	Slovenia	513
Slovenia	510	Slovenia	505	Australia	510
Belgium	507	Netherlands	503	United Kingdom	509
Germany	506	Australia	503	Germany	509
Poland	504	Sweden	500	Netherlands	509
Ireland	504	Denmark	500	Switzerland	506
Norway	502	France	499	Ireland	503
Austria	497	Belgium	499	Belgium	502
New Zealand	495	Portugal	498	Denmark	502
Viet Nam	495	United Kingdom	498	Poland	501
Russia	494	Taiwan	497	Portugal	501
Sweden	494	United States	497	Norway	498
Australia	494	Spain	496	United States	496
France	493	Russia	495	Austria	495
United Kingdom	492	China*	494	France	495
Czech Republic	492	OECD Average	493	Sweden	493
Portugal	492	Switzerland	492	OECD Average	493
OECD Average	490	Latvia	488	Czech Republic	493

## Towards Being World's First Smart Nation

Singapore is building a Smart Nation that functions beyond the capabilities of a Smart City. With an ultra-high speed, pervasive, intelligent and trusted ICT infrastructure, as well as a vibrant ICT ecosystem with a ready pool of tech talent, which are achievements of the IN2020 masterplan, Singapore is ready to be a Smart Nation.

### WHERE SINGAPORE STANDS TODAY

**1st**

**DELIVERING E-GOVERNMENT**

1st in the world in digital government, 1st in the world in digital public services (World Economic Forum, 2015)

**2nd**

**DOING BUSINESS IN SINGAPORE**

2nd most competitive economy in the world (Economic Freedom of the World, 2015)

**1st**

**LIVING IN SINGAPORE**

1st in the world in digital quality of life (World Economic Forum, 2015)

### DIGITALLY-ENABLED POPULATION

**data.gov.sg** **Onebox**

DRIVE SOCIAL INNOVATION WITH DATA

8,800 datasets released

**digital services for citizens**

87% of citizens use digital services

**ACCESS TO COMPUTER**

97% of citizens use computers

**ACCESS TO BROADBAND**

87% of citizens use broadband

### SKILLED TECH TALENT

**146,000** tech talent

1st in the world in digital talent (World Economic Forum, 2015)

**Key R&D Initiatives - DR, Labs, Acceleration and Incubation** - to boost the tech ecosystem.

### VIBRANT TECH INDUSTRY & STARTUP ECOSYSTEM

**DRIVE SOCIAL INNOVATION WITH DATA**

8,800 datasets released

**STARTUP INVESTMENT**

\$517 billion

### TECHNOLOGY-ENABLED SECTORS

**NATIONAL ELECTRONIC HEALTHCARE**

36 million patients

**ICT FOR PRODUCTIVITY AND INNOVATION (IPIC)**

\$550 million

**COMPREHENSIVE ONLINE GOVERNMENT SERVICES**

98% of services

**EFFECTIVE LEARNING AND TEACHING**

50 applications

### SEAMLESS & PERSVASIVE CONNECTIVITY

**Wireless@SG**

10,000 hotspots

**TRUSTED REGULATORY FRAMEWORK**

3,000 applications

## DIGITALLY-ENABLED POPULATION

**DRIVE SOCIAL INNOVATION WITH DATA**  
8,800 datasets released to public on data.gov.sg and Data.gov.sg.

**USEFUL E-SERVICES FOR CITIZENS**  
Receive and read government letters all in one digital mailbox.

**RAISE THE ADOPTION OF INTERNET ACCESS**  
S\$8million Digital Inclusion Fund to benefit 6,000 low-income households and individuals.

**ACCESS TO COMPUTER**  
97% of resident households in Singapore with school-going children have access to a computer at home.

**ACCESS TO BROADBAND**  
87% of resident households in Singapore have access to a computer at home, and 87% have access to broadband.

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## SKILLED TECH TALENT

Singapore is home to more than **146,000** Infocomm professionals, with a wide range of training and development opportunities.

**NATIONAL INFOCOMM COMPETENCY FRAMEWORK (NICF)**  
Continual Education Training Centres to develop and launch NCCF accredited courses in areas such as strategic IT risk management and enterprise business analysis.

**CORPORATE PARTNERS FOR PROFESSIONAL DEVELOPMENT**  
Centres of Attachment and Competency-Led Training Programme to equip both young and experienced tech talent with expertise to take on high-growth ICT roles.

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## VIBRANT TECH INDUSTRY & STARTUP ECOSYSTEM

Key IDA Initiatives – IDA Labs, Accreditation and Accelerator – to boost the tech ecosystem.

**IDA LABS** support the collaboration of individuals, companies and government agencies to generate innovative IP from ideation to production.

**STARTUP INVESTMENT**  
**S\$1.7 billion** in venture capitalists' funding for Singapore-based technology companies in 2015\*.

\*Data from Asian Venture Capital Fund

**ACCELERATOR** are to build high growth Singapore-based tech product startups.

**Accredited**  
**ACCREDITATION@IDA** aims to help innovative tech product startups build their credibility as qualified vendors to government and large enterprise buyers.

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## TECHNOLOGY-ENABLED SECTORS

Singapore continues to drive adoption of tech to enhance innovation and productivity among the various economic sectors.

**NATIONAL ELECTRONIC HEALTH RECORD**  
has been deployed to **36** healthcare centres, including hospitals, specialist clinics and polyclinics.

**ICT FOR PRODUCTIVITY AND GROWTH (IPG) PROGRAMME**  
**S\$500 million** for small and medium enterprises (SMEs) to step up on the adoption and innovative use of ICT.

**COMPREHENSIVE ONLINE GOVERNMENT SERVICES**  
Nearly **98%** of public services in Singapore are available online, the majority of them being transactional in nature\*.

\*WASERA eGovernment ranking survey 2014

**EFFECTIVE LEARNING AND TEACHING**  
All schools have implemented Infocomm Competency Training in their curriculum. **50** applications rolled out from the Futureschools programme.

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## SEAMLESS & PERVASIVE CONNECTIVITY

**SINGAPORE'S WIRED NETWORK**  
NBNBN achieved nationwide fibre coverage since mid 2013. More than **550,000** subscribers served by 27 different service providers.

**Wireless @SG**  
Hotspots to increase to **10,000** by 2015, and to double to **20,000** by 2016.

## TRUSTED REGULATORY FRAMEWORK

**FOURTH GENERATION** Telecommunication services deployed nationwide since June 2013.

**PERSONAL DATA PROTECTION**  
Do Not Call Register launched on 2 January 2014, with **> 600,000** numbers and about **3,000** organisations registered.

**ENABLING SPECTRUM EFFICIENCY**  
to regulate use of TV White Space spectrum band, increasing capacity and data connectivity, and allowing consumers to access more options for wireless services.

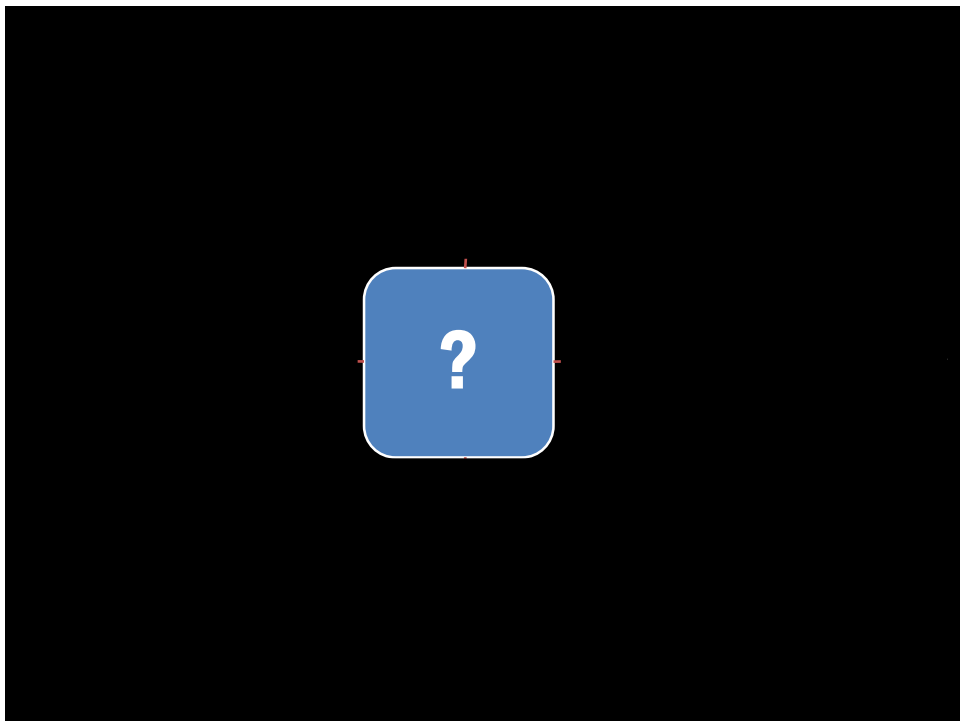
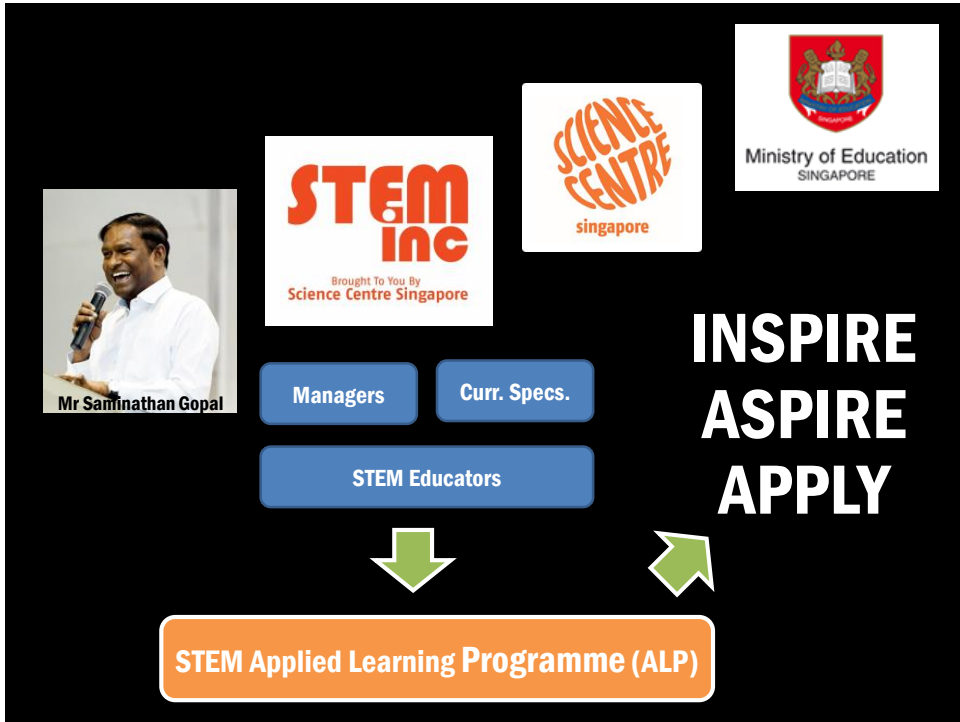
## The HARDEST SKILLS to find

For the first time, **Sales Representatives** are the hardest jobs to fill in Singapore; **Engineers** are in second place, followed by **Technicians** and **Accounting & Finance Staff**.

- 1 **Sales Representatives**  
*(sales executives, sales advisors and retail sales people)*
- 2 **Engineers**  
*(mechanical, electrical and civil engineers)*
- 3 **Technicians**  
*(production, operations or maintenance technicians)*
- 4 **Accounting & Finance Staff**  
*(bookkeepers, certified accountants and financial analysts)*
- 5 **Drivers**  
*(truck, lorry, heavy goods, delivery, heavy equipment and construction drivers)*
- 6 **Skilled Trades**  
*(electricians, carpenters, welders, bricklayers, plasterers, plumbers, masons and more)*
- 7 **Project Managers**
- 8 **Teachers**
- 9 **Production/ Machine Operators**  
*(operators of special machinery)*
- 10 **Laborers**

▲ more than previous year  
▶ same as previous year  
▼ less than previous year

4





## STEM ALP Themes



Embedded  
Electronics



Engineering Design  
& Modelling



Robotics



Food Science &  
Technology



Alternative Energy



Urban Design &  
Innovation

# STEM ALP Themes



eWater Sensors & Water Technology



Materials Science



eHealth Sensors



Applied Health Sciences

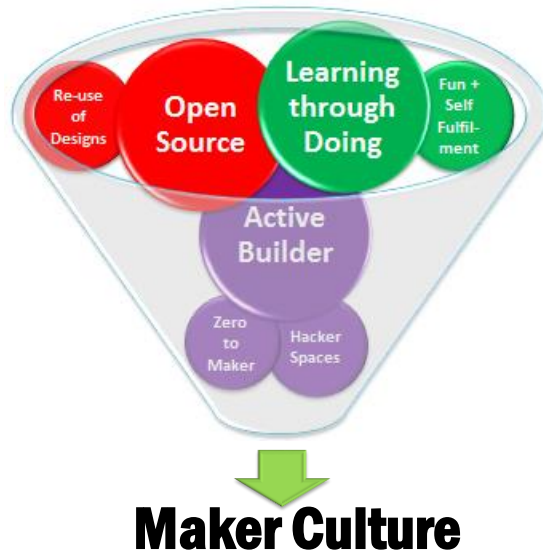


Flight & Aerospace

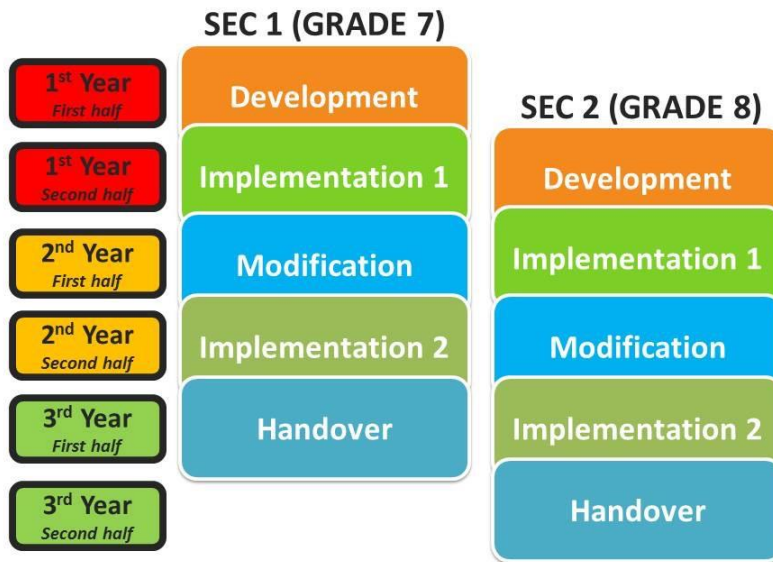


Game Design & Simulation











**STEM ALP Tier 1**



**STEM  
ALP  
Tier 2**



# Industry Partnership Programme



**Advice on STEM ALP**



**Learning Journeys**

**Job Shadowing**



**Workshops**



**Sharing of aspirations & experiences**

**CSR**

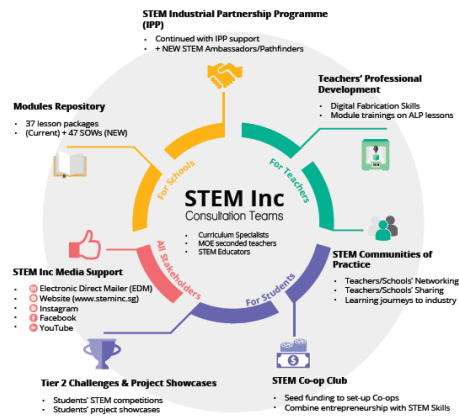


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## CONTINUED SUPPORT For STEM ALP Schools

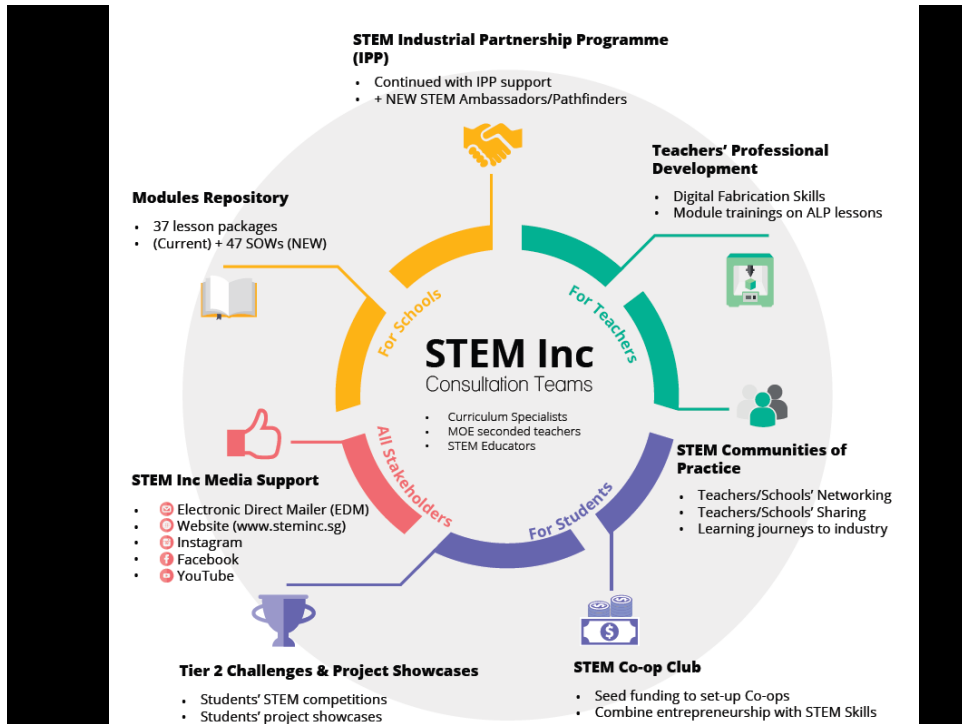
2017  
to  
2019



For enquiries, please contact STEM Inc Consultation Teams.

A collaboration between:





**STEM Inc**  
Health & Applied Learning Centre Singapore

HOME ABOUT US APPLIED LEARNING PROGRAMME INDUSTRIAL PARTNERSHIP PROGRAMME

- EMBEDDED ELECTRONICS
- ENGINEERING DESIGN & MODELLING
- ROBOTICS
- FOOD SCIENCE & TECHNOLOGY
- ALTERNATIVE ENERGY
- URBAN DESIGN & INNOVATION
- EWATER SENSORS & WATER TECHNOLOGY
- MATERIALS SCIENCE
- EHEALTH SENSORS
- APPLIED HEALTH SCIENCES
- FLIGHT & AEROSPACE
- GAME DESIGN & SIMULATION
- OUR SCHOOLS

Applied Health Sciences (Forensic Science)

Applied Learning Programme

[www.steminc.sg](http://www.steminc.sg) | [ong\\_yao\\_teck@science.edu.sg](mailto:ong_yao_teck@science.edu.sg) | [sendchester@gmail.com](mailto:sendchester@gmail.com)