



Overview of the Education System and Education Research in Singapore

Israeli Academy of Sciences
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Overview

1. Singapore Context

2. Investment in Education Research

3. Advancing Education Research in Singapore

4. Grand Challenges, Future Directions
Collaboration Possibilities

Singapore

- 5.61 million – 74.3% Chinese, 13.4% Malay, 9% Indian, 3.2% Others.
- Official languages – Chinese, English, Malay, Tamil. English – dominant language of administration, business, education.
- Governed by one political party since independence (1965).

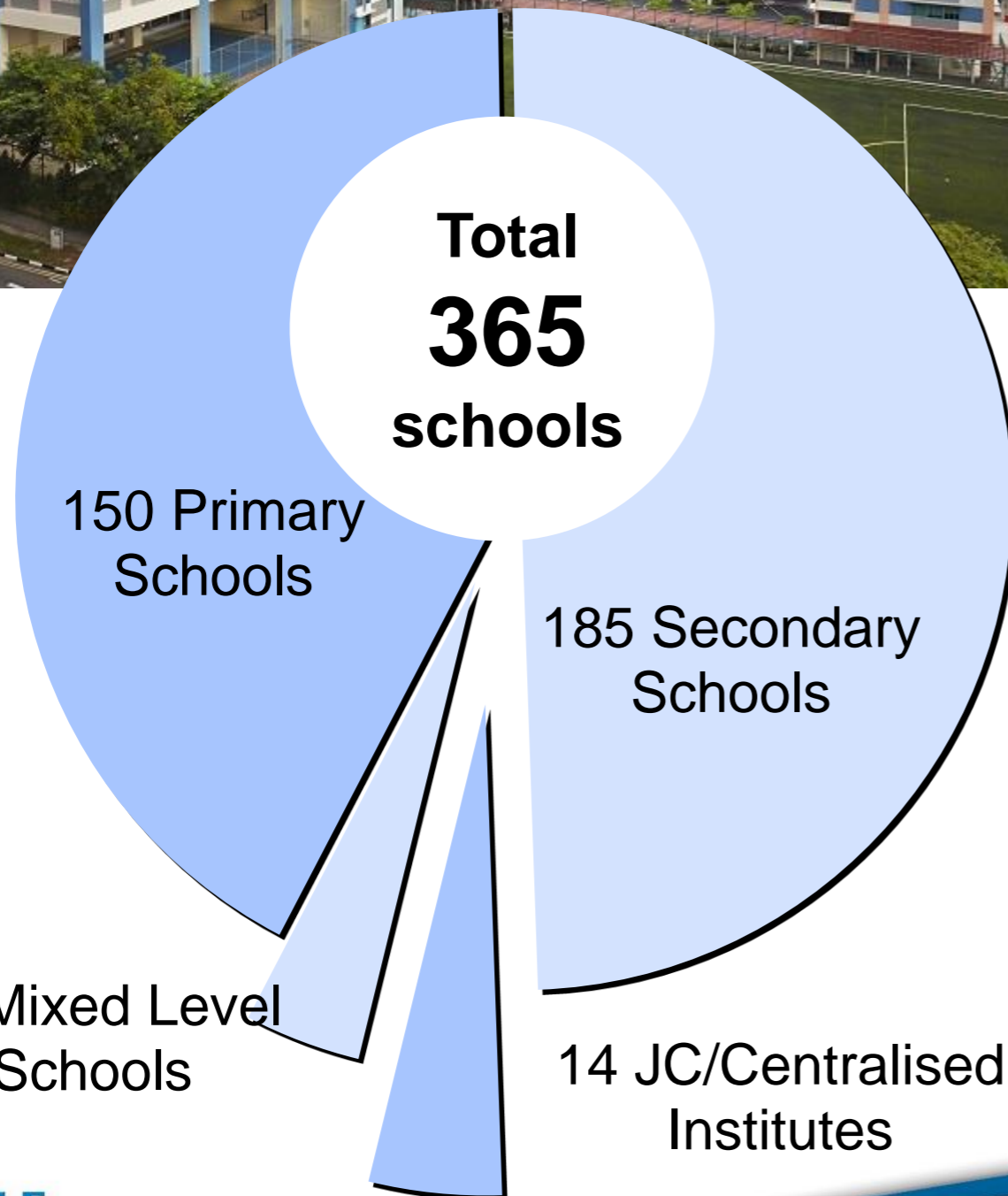
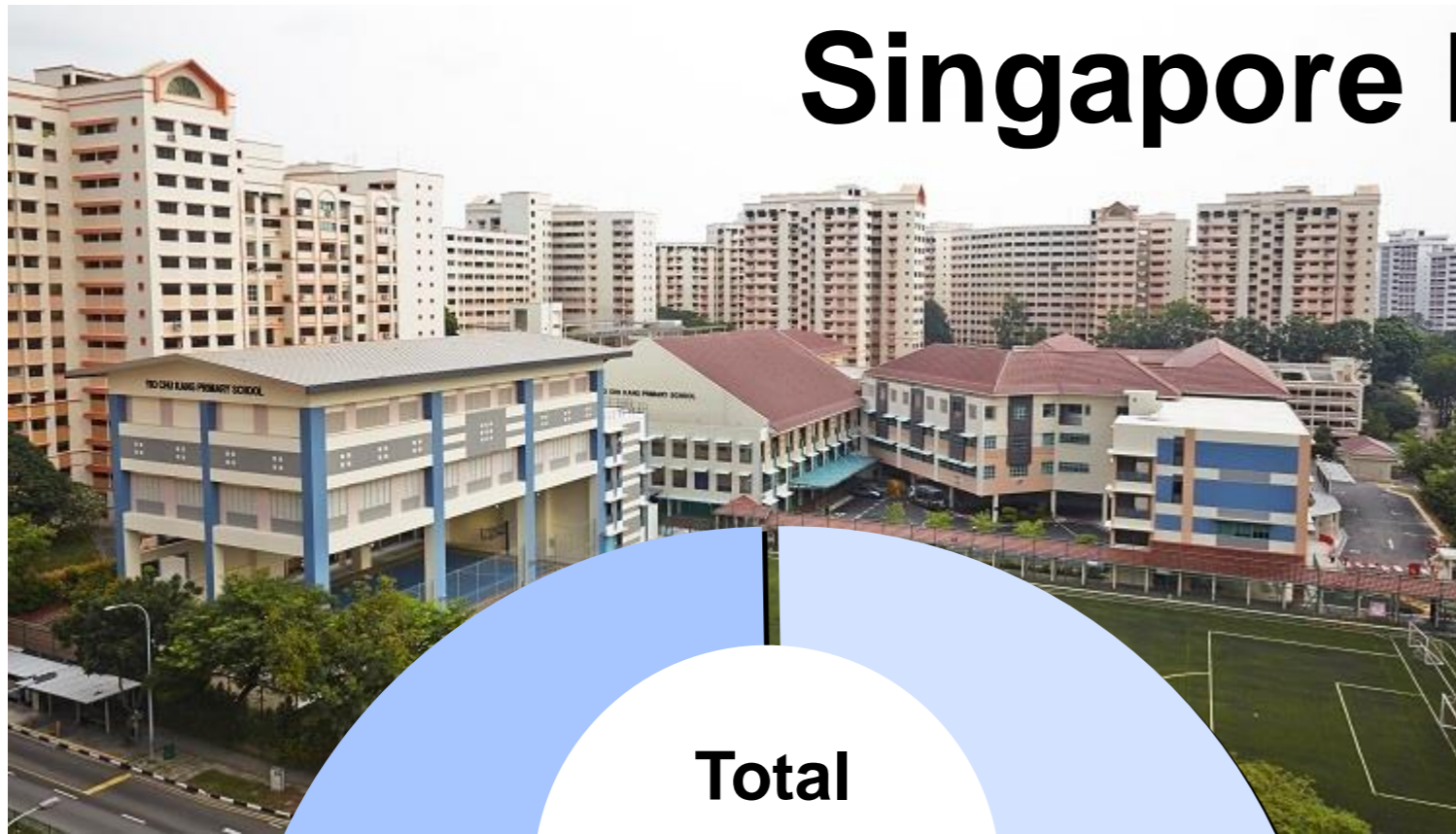


Israel & Singapore

- Geographical: small & surrounded
- Historical tensions over religion and ethnicity
- Strong emphasis on military, including emulating Israel's system
- An unlikely existence: “I thought our people should understand how vulnerable Singapore was and is, the dangers that beset us, and how we nearly did not make it.” (Lee Kuan Yew, 2012).

<https://www.timesofisrael.com/singapore-vs-israel-whos-the-better-role-model/>
<http://www.tabletmag.com/scroll/189871/the-singapore-story-is-the-israel-story>

Singapore Education Context



| | |
|--------------------|---|
| Primary | Grades 1 to 6 |
| Secondary | Grades 7 to 10 |
| Mixed Level | Primary + Secondary or Secondary + Junior College |

Junior College Grades 11 to 12

Total Enrolment 446,582 students

Total Teachers 33,378 teachers

Graduate Teachers Primary 76.4%
Secondary 95.2%

(Education Statistics Digest, 2017)

Singapore as Developmental State

- Developmental states privilege **economic development** as a means of ensuring political legitimacy and building resources for infrastructure (Gopinathan, 2015).
- Core belief that without economic growth, social cohesion and a vision for the future, nations and societies cannot endure.
- Education \leftrightarrow Economy



4 Reform Transitions

1. Building a post-colonial education system: social cohesion and skill-building
 - Survival-Driven Education (1965-1978)
2. Building a system for an industrial economy
 - Efficiency-Driven Education (1979-1997)
3. Building a system for a knowledge-based economy
 - Ability-Driven Education (1997-2011)
4. Building a system for social cohesion
 - Student-Centric Values-Driven Education (2012-Present)



Photo Courtesy of Toh Tuck Secondary School Facebook Page



Schools in Singapore



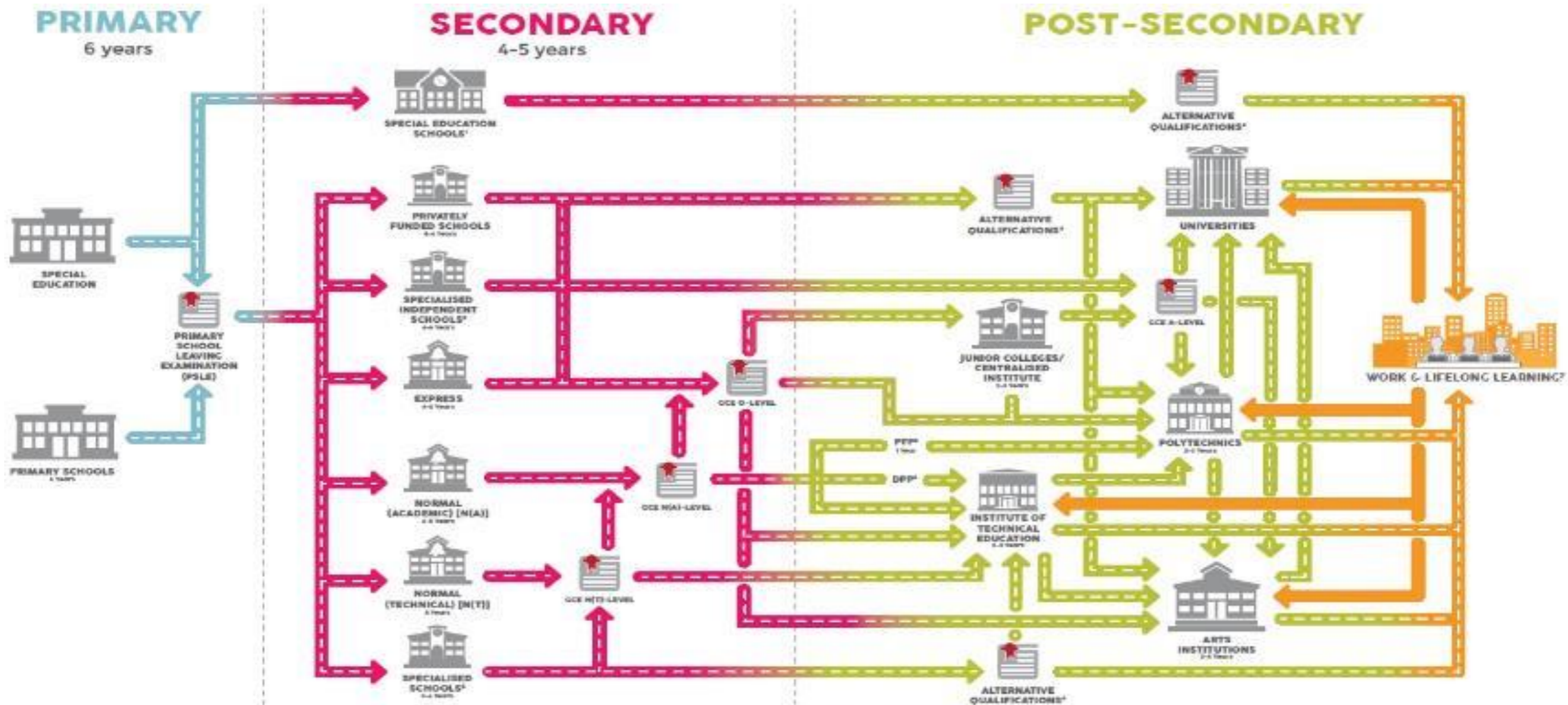
Classrooms in Singapore



Educational Indicators (ESD, 2017)

| Percentage of P1 Cohort : ¹ | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|------|------|------|------|------|------|
| (a) Eligible for Secondary School ² (Refer to students who sat for the PSLE and qualified for Express, Normal (Academic) or Normal (Technical) courses) | 97.9 | 97.9 | 97.7 | 97.7 | 98.0 | 98.3 |
| (b) who had at least 5 N-Level passes or 3 O-Level passes ² | 88.9 | 88.5 | 88.9 | 88.9 | 89.4 | 89.8 |
| (c) Admitted to: ³ | | | | | | |
| (i) <i>Nitec / Higher Nitec</i> courses (full-time) | 21.0 | 20.9 | 22.4 | 23.5 | 24.3 | 24.8 |
| (ii) Publicly-funded diploma courses (full-time) ⁴ | 47.5 | 47.7 | 47.6 | 47.8 | 47.2 | 46.9 |
| (iii) Pre-university courses | 27.0 | 27.8 | 28.1 | 27.9 | 27.7 | 28.4 |
| (iv) Publicly-funded degree courses (full-time) ⁵ | 27.8 | 29.3 | 29.9 | 30.6 | 32.0 | 34.2 |

Singapore Education System – “Bridges & Ladders”



What Singapore's education system has achieved

- Sound and robust schools
- Reduced dropout rate
- Improved academic achievements
- Better trained teachers and principals
- Better facilities
- Well-aligned and coherent education system
- Nexus of educational research, practice, and policy.



Importance of Relevant Research

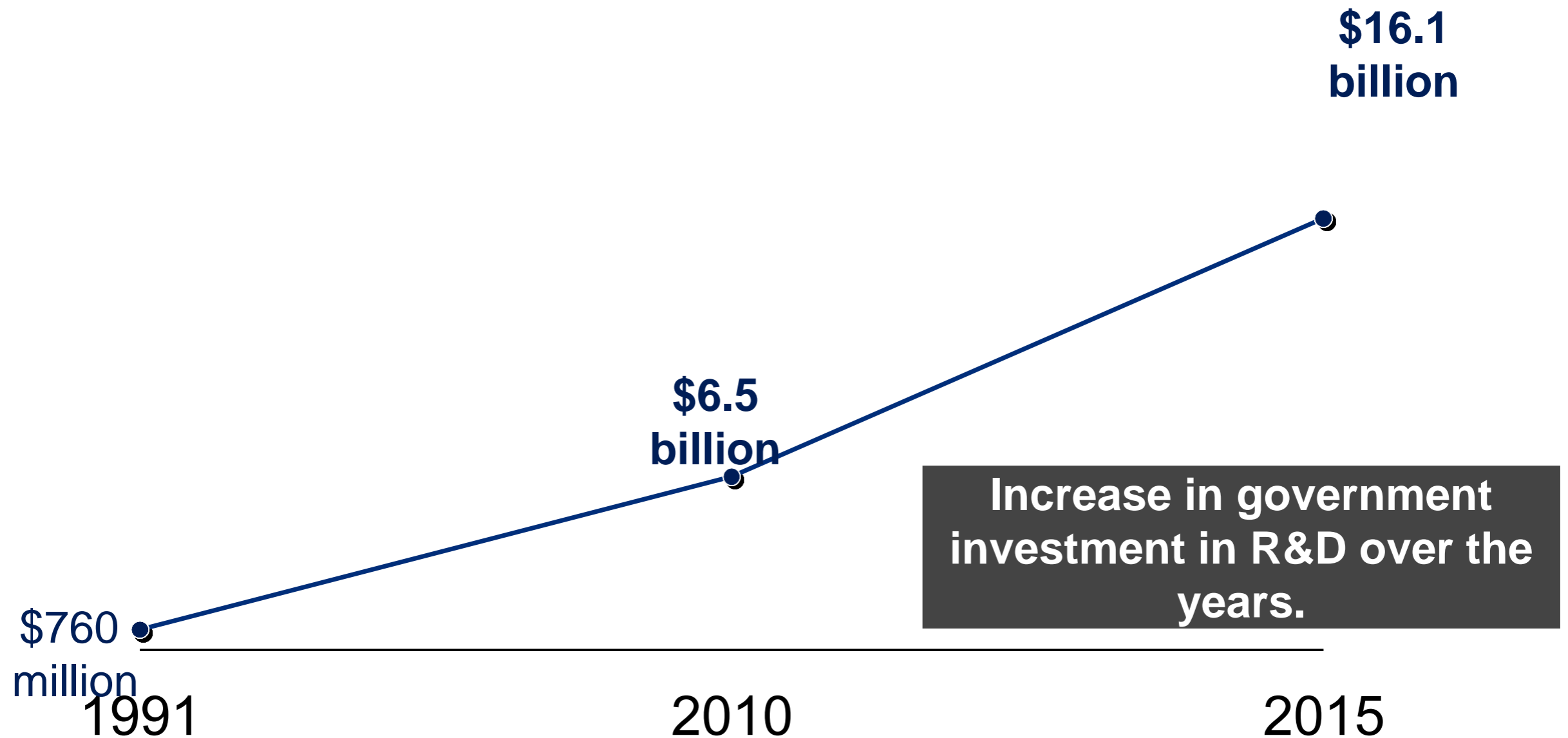
... We will encourage research, preferably research with relevance to the economy or to society (Lee Kuan Yew, Address to University Staff, 20 May 1980).



Research, innovation and **enterprise** are important to Singapore's economy and future sustainability.



Research and Development in Singapore



Business

Govt commits S\$19b to new 5-year plan for R&D initiatives RIE2020

Plan will contribute significantly to the economy and create opportunities and jobs, support national initiatives like Smart Nation and SkillsFuture, and help workers to thrive amidst technological changes and globalisation, says PM Lee.



Thinking Schools, Learning Nation (TSLN, 1997)

“What is critical... is that we fire in our students a **passion for learning**, instead of studying for the sake of getting good grades in their examinations. I must say this passion is generally lacking among our students, including many among our most able. Their knowledge will be fragile, no matter how many ‘A’s they get, unless they have the desire and aptitude to **continue discovering new knowledge** well after they leave school.



Prime Minister, Goh Chok Tong, Speech at the Opening of the 7th International Conference on Thinking in 1997, para. 21.

Teach Less, Learn More (TLLM, 2004)



| More... | Less... |
|--|---|
| Focus on Quality of Learning Engaged Learning | Focus on Quantity of Learning Drill and Practice |
| Differentiated Teaching | ‘One-size-fits-all’ Instruction |
| Guiding, Facilitating, Modelling | Telling |
| Formative and Qualitative Assessing | Summative and Quantitative Testing |
| Spirit of Innovation and Enterprise | Emphasis on Examinations |

Education Research Objectives Circa 2003

CRPP established in 2003 with four key objectives:

- to describe & measure patterns of Singaporean **classroom pedagogy**
- to measure the impact of pedagogical practices on **student outcomes**
- to improve pedagogical practice through evidence-based **intervention strategy**
- to support **evidence-based** policy formulation to meet the challenges of 21st century environments



Prof Allan Luke
Founding Dean CRPP

NIE's Research Journey



NIE's Research Centres

Office of Education Research

It facilitates the **governance, planning, monitoring, quality assurance and dissemination of education research across the Institute.**

Another key function of OER is to **administer the Education Research Funding Programme (ERFP)**, a pool of research funds provided by the Ministry of Education (MOE), Singapore.

3

Research Centres

Centre for Research in Pedagogy & Practice (CRPP)

The Centre for Research in Pedagogy and Practice was established in 2003 by the National Institute of Education and funded by the Ministry of Education to be an education research centre of excellence in pedagogy and practice.

Education and Cognitive Development Lab (ECDL)

The Education and Cognitive Development Lab (ECDL) focuses on four thematic research areas: Applied Cognitive Development, Atypical Development, Bilingual Development, and Intervention.

Learning Sciences Lab (LSL)

Learning Sciences Lab (LSL) explores learning and teaching wherever the action is. Our central goal is to involve children and adults in creating opportunities to make learning not only possible but available and better.

28 Research Areas

Learner's Social and Cognitive Development

- Applied Cognitive Development
- Motivational Studies
- Children at Risk (Disability)
- Children at Risk (Low Progress Learners)
- Preschool/Early Childhood Education

Teacher Learning & Professional Development

- Teacher Education
- Teacher Learning & Professional Development

Curriculum & Instruction

- Mathematics
- Science
- Character & Citizenship / Values Education
- Humanities
- Sports
- Arts and Music
- English & Mother Tongue Languages
- Bilingual & Biliteracy Development
- Assessment
- Creativity & 21st Century Competencies
- Play/Game-based Learning
- Student-generated Design
- ICT Integration
- Seamless Learning
- Social Media & Multi-modalities

Leadership, Organization & System Studies

- Leadership & School Organization
- Education & Broader Environment
- System Studies in Pedagogies & Educational Outcomes

Scaling, Translation & Knowledge Management

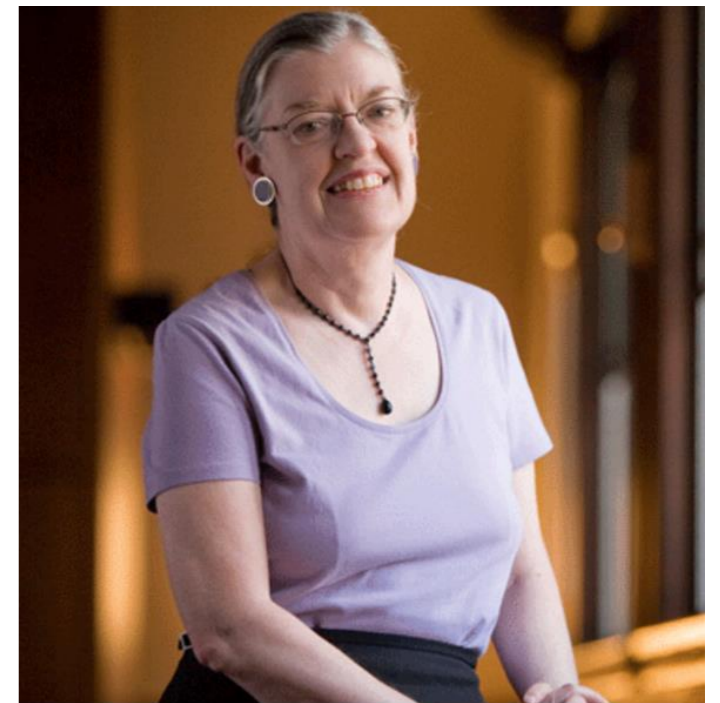
- Scaling and Translation
- Knowledge Management

International Benchmarking

- International & Comparative Studies

Advancing Education Research: Rigor *and* Relevance

Educational progress is most likely to emerge from approaches to **research that create an equal footing for practitioners and researchers**, recognizing that ... both have a role in creating tools (curricula, practices, professional development approaches) that can be used to forge **lasting improvements** (Snow, 2015, p. 460).



Prof Catherine Snow, Harvard University

Knowledge Production in Education

| Rigor | Relevance / Utility | |
|-------|---|---|
| | No | Yes |
| Yes | <p>Bohr's Quadrant <i>High quality "basic" disciplinary research (e.g., cognition and learning)</i></p> | <p>Pasteur's Quadrant <i>High quality "basic" research (eg., cognition and learning); high quality policy related research; high quality "partnership" innovations; high quality school-based action research</i></p> |
| No | <p>Merlin's Quadrant <i>Small, non-representative, under-theorized, methodologically sloppy "mickey mouse" research studies</i></p> | <p>Edison's Quadrant <i>Informal, practical "tinkering" by classroom practitioners; semi-formalized action research by classroom teachers; some university research</i></p> |

Substantial Investment in the Development of Baseline Databases

to support Informed Dialogue among
Researchers, Practitioners and Policy Makers

Professional Learning as a Strategy

to ensure Knowledge Application

Design Research as a research approach

to incorporate rich contextual information
and practitioner knowledge

NIE Strategies

to engage in Theory-Practice Nexus
& Advance Education Research

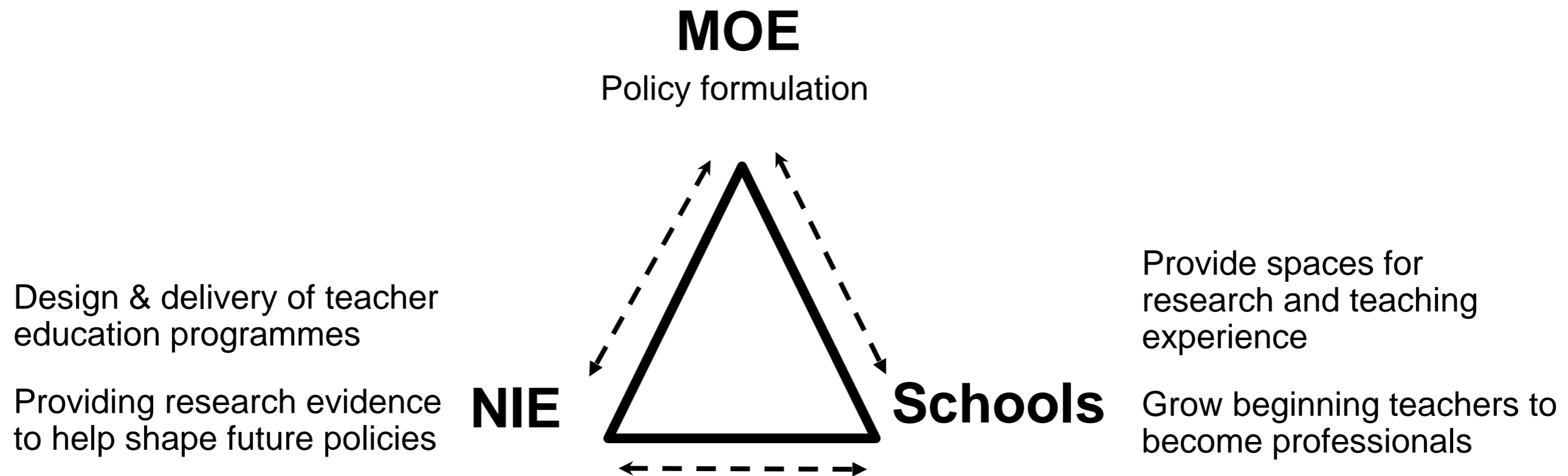
Developing a Distinctive Suite of Signature TE Programmes

Enhancing Partnerships with
Key Stakeholders and Universities to
Grow Teaching and Research
Productivity and Impact

Investment in Enhancing Research Capabilities

Enhancing Partnerships with Key Stakeholders to Grow Teaching & Research Productivity and Impact

A key success factor for Singapore's high performance in international education benchmarks is the close **partnership** and **alignment** between **NIE**, **MOE** and schools in **Singapore**.



Collaborating with MOE and schools to deliver **rigorous, relevant and responsive** programmes for pre-service, in-service teachers and school leaders, and research that can inform policy and practice.

The ultimate goal of such strong partnerships is enhancing the learning outcomes of students in our school system.

Impact: Increased Partnerships with MOE



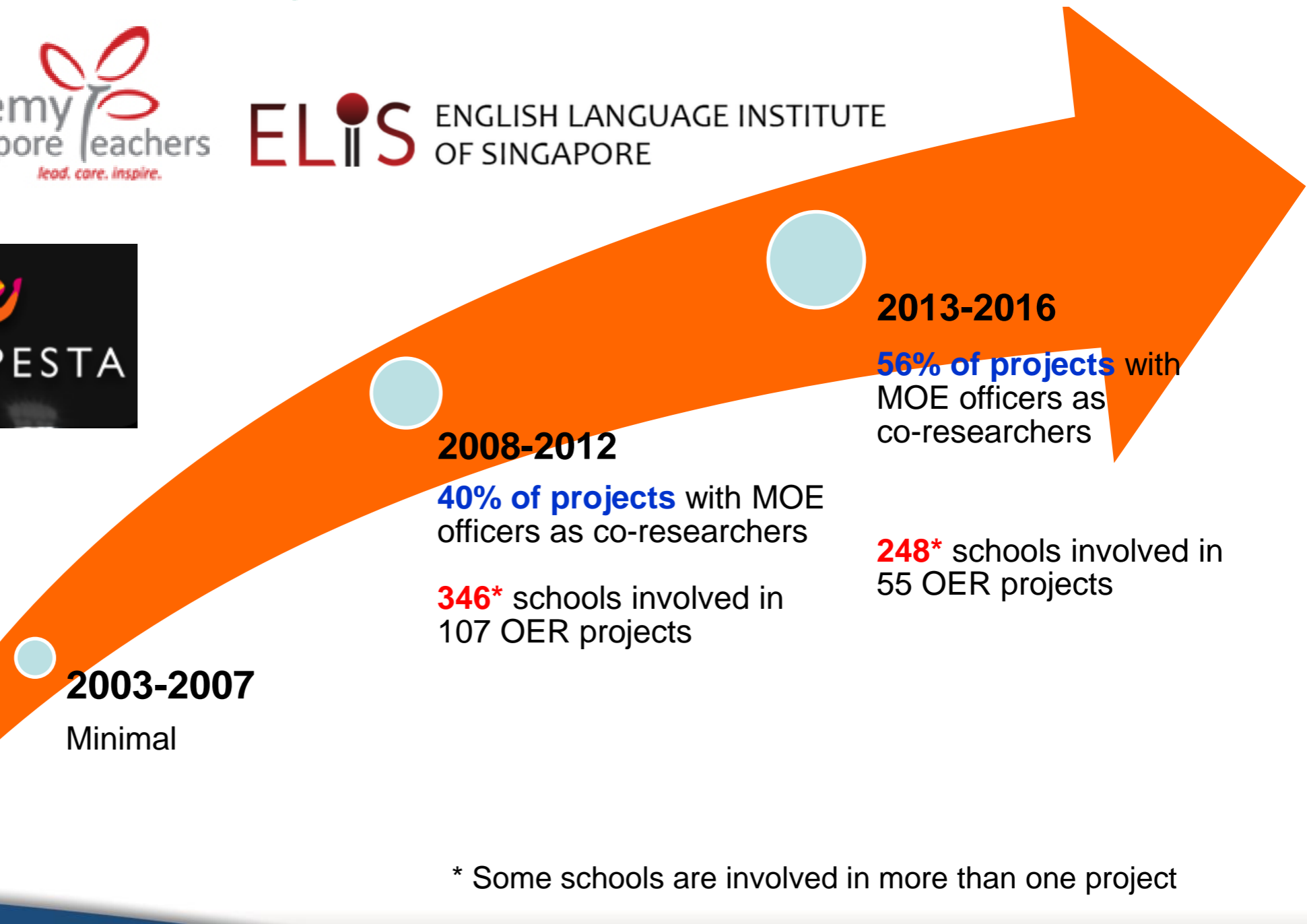
Ministry of Education
SINGAPORE



Singapore Teachers' Academy for the aRts

Academy
of Singapore Teachers
lead. care. inspire.

ELIIS ENGLISH LANGUAGE INSTITUTE
OF SINGAPORE



* Some schools are involved in more than one project

Professional Learning as a Strategy

- Leverage on NIE's pre-service and in-service **programmes**
- Three international **peer-reviewed journals** managed by NIE.
- Regular academic local and international **conferences** which are well attended by Singaporean teachers.
- **Practitioner-oriented publications** distributed to schools, MOE and are available online. Such publications highlight ongoing and completed NIE research as well as educational and practitioner themes that are helpful to teachers, school leaders, policy-makers and curriculum designers.



Grand Challenges in Singapore: Social Mobility

- “[Social mobility challenges] will be with us for a long while. They are not one-off challenges, not challenges for 10 or 15 years. They are challenges for decades to come” – Deputy Prime Minister Shanmugaratnam (2018).

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Deep changes in social spending

Social mobility, ageing are Singapore's big challenges: Tharman



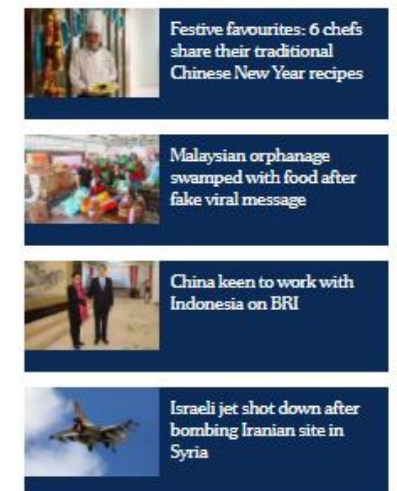
1 of 2 One in four Singaporeans will be aged 65 and above by 2030, a dramatic shift from today's figure of about one in eight. This is already propelling healthcare spending upwards, said DPM Tharman Shanmugaratnam. ST FILE PHOTO

PUBLISHED JAN 28, 2018, 5:00 AM SGT



Over the past decade, government spending more than doubled from \$33 billion to \$71 billion - and is set to increase further. Ahead of Budget Day on Feb 19, Insight looks at where spending demands are greatest: healthcare, infrastructure and jobs. The first of a three-part series, this week's feature examines Singapore's social policies, and pressing issues in healthcare.

ST VIDEOS



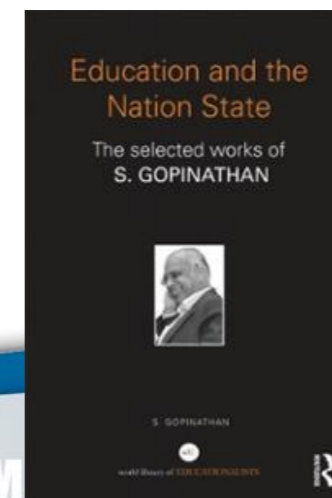
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Researching Education for the Future

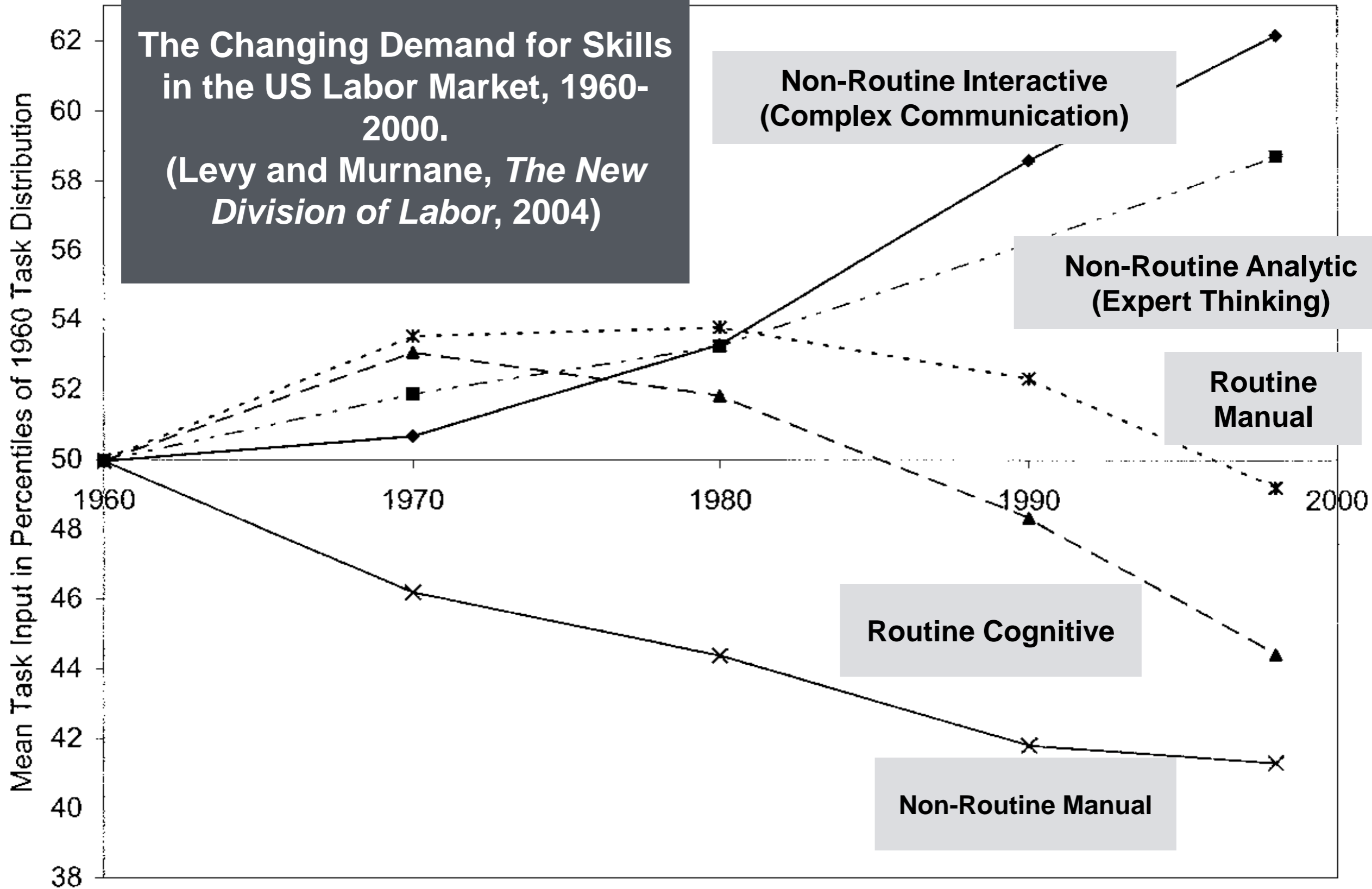
- Can changes in Singapore education rapidly raise the capacity for **innovation and entrepreneurship**?
- Can an education system that directs the talented into the professions and civil service change to create more **enterprising, risk-taking individuals**?
- Can changes build resilience, strengthen attachments in the face of threats, establish **new norms for identity formation**, civic participation and **citizenship**, and strengthen **social cohesion**?

(Gopinathan, 2006, p. 224).



**The Changing Demand for Skills
in the US Labor Market, 1960-
2000.**

(Levy and Murnane, *The New
Division of Labor*, 2004)



- ■ — Nonroutine analytic
- ▲ — Routine cognitive
- ◆ — Nonroutine interactive
- * — Routine manual
- × — Nonroutine manual

22 May 2012 Last updated at 23:03



Singapore wants creativity not cramming

By Rebecca Lim
BBC News, Singapore

Singapore's schools have become global role models, with consistently high results in international tests.

But now they want to move beyond this - towards something that cultivates creativity and what they term as "holistic education".

Minister for Education, Heng Swee Keat, said this is "less about content knowledge" but "more about how to process information".

He describes this challenge to innovate as being able to "discern truths from untruths, connect seemingly disparate dots, and create knowledge even as the context changes".

This strategy aims to prepare today's students for the demands of the next 20 years.

It means that schools are under more pressure - and will be given more leeway - to come up with creative ways to teach the syllabus.

Outside the classroom

So instead of the traditional images of high-pressure Asian schools - with rows of heads buried in books - they are trying different approaches to learning.



Kicking on: Singapore's education system, praised for high test results, is now targeting innovation

Knowledge economy

France plans top 10 mega-university

University with mission to defend democracy

Power behind Qatar's global lessons

US targets debts for dead-end degrees

The young Singaporean adult...

- RISK AVERSE
- EASILY DISCOURAGED
- IN A COMFORT ZONE
- DOESN'T THINK OUTSIDE THE BOX
- WANTS INSTANT RESULTS
- MIGHT HAVE HAD GOOD GRADES BUT LACKS STREET SMARTS

Young Singaporeans lack drive, some CEOs told Education Minister Heng Swee Keat. While the definition of 'drive' is debatable, attitudes have definitely changed, say employers

Economy, Society, Workplace

| From | To |
|---|--|
| Connectivity – fast, free, easy for you, ubiquitous | Complexity – fast, free, easy for you, invisible |
| Geographically-bounded Society | Everywhere Society |
| Workplace 9-to-5 Economy | Gig On-demand Economy |
| Structured workplace | Flexible and autonomous workplace |
| Finding Jobs | Inventing Jobs |
| Hiring because of history | Hiring because of mastery |
| Focus on career-building & credentials | Focus on skills-building & badges/ certifications |
| Work Hard, Be Rewarded – Lifelong employee | Work Smart, Learn Always, Reward Yourself, Be Wise |

Multiple Educational Pathways

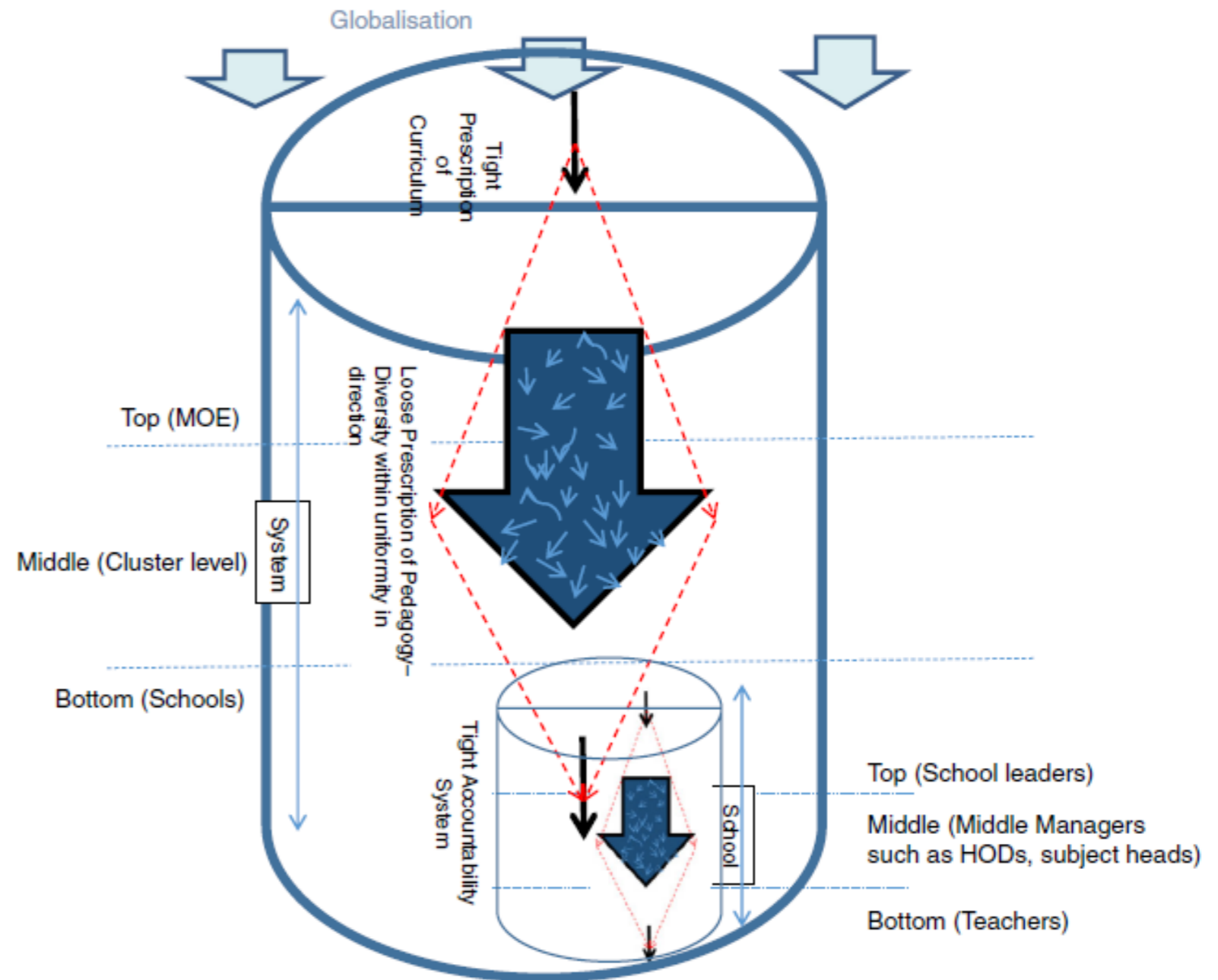
“Singapore needs to make the transformation from a ‘scarcity mentality’ that focuses on a single pathway to success to an **‘abundance mentality’** with multiple pathways”



- Minister Heng Swee Keat,
Committee of Supply Parliamentary
Debate 2015.

Systemic Tensions

- Centralisation – Decentralisation
 - Centralised Ministry
 - Increasing decentralization of schools
- Tight–Loose–Tight system (Toh, Hung, Chua, He & Jamaludin, 2016)
 - Tight prescription of curriculum
 - Loose prescription of pedagogy
 - Tight accountability systems



Thank you