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.


- 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/
Singapore Education Context

Total 365 schools

- 150 Primary Schools
- 185 Secondary Schools
- 16 Mixed Level Schools
- 14 JC/Centralised Institutes

**Primary**
- Grades 1 to 6

**Secondary**
- Grades 7 to 10
- 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 ↔ 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

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)
Schools in Singapore
Classrooms in Singapore
## Educational Indicators (ESD, 2017)

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<tbody>
<tr>
<td>(a) Eligible for Secondary School² (Refer to students who sat for the PSLE and qualified for Express, Normal (Academic) or Normal (Technical) courses)</td>
<td>97.9</td>
<td>97.9</td>
<td>97.7</td>
<td>97.7</td>
<td>98.0</td>
<td>98.3</td>
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<tr>
<td>(b) who had at least 5 N-Level passes or 3 O-Level passes²</td>
<td>88.9</td>
<td>88.5</td>
<td>88.9</td>
<td>88.9</td>
<td>89.4</td>
<td>89.8</td>
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<tr>
<td>(c) Admitted to:³</td>
<td></td>
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<tr>
<td>(i) Nitec / Higher Nitec courses (full-time)</td>
<td>21.0</td>
<td>20.9</td>
<td>22.4</td>
<td>23.5</td>
<td>24.3</td>
<td>24.8</td>
</tr>
<tr>
<td>(ii) Publicly-funded diploma courses (full-time)⁴</td>
<td>47.5</td>
<td>47.7</td>
<td>47.6</td>
<td>47.8</td>
<td>47.2</td>
<td>46.9</td>
</tr>
<tr>
<td>(iii) Pre-university courses</td>
<td>27.0</td>
<td>27.8</td>
<td>28.1</td>
<td>27.9</td>
<td>27.7</td>
<td>28.4</td>
</tr>
<tr>
<td>(iv) Publicly-funded degree courses (full-time)⁵</td>
<td>27.8</td>
<td>29.3</td>
<td>29.9</td>
<td>30.6</td>
<td>32.0</td>
<td>34.2</td>
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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.
Increase in government investment in R&D over the years.
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)

<table>
<thead>
<tr>
<th>More…</th>
<th>Less…</th>
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<tbody>
<tr>
<td>Focus on Quality of Learning</td>
<td>Focus on Quantity of Learning</td>
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<tr>
<td>Engaged Learning</td>
<td>Drill and Practice</td>
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<tr>
<td>Differentiated Teaching</td>
<td>‘One-size-fits-all’ Instruction</td>
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<tr>
<td>Guiding, Facilitating, Modelling</td>
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<tr>
<td>Formative and Qualitative Assessing</td>
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<tr>
<td>Spirit of Innovation and Enterprise</td>
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<td></td>
<td>Emphasis on Examinations</td>
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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

Strategy on Research Focus

- 2002-2007: ER1.0 (S$48m)
  - Baseline Studies
- 2008-2012: ER2.0 (S$96.6m)
  - Baseline Studies
  - Intervention Studies
- 2013-2017: ER3.0 (S$111.58m)
  - Scaling & Translation
  - Intervention Studies
  - Baseline Studies

Organizational Strategy

- Establish Research Center
- Foster NIE-Wide Research
- Develop Peaks of Excellences
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)

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

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

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

Tushman & O’Reilly, “Research and Relevance: Implications of Pasteur’s Quadrant for Doctoral Programs and Faculty Development” AMJ, 50, 4, 2007

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
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**.

**MOE**
Policy formulation

**NIE**
Design & delivery of teacher education programmes
Providing research evidence to help shape future policies

**Schools**
Provide spaces for research and teaching experience
Grow beginning teachers to become professionals

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

2003-2007
Minimal

2008-2012
40% of projects with MOE officers as co-researchers
346* schools involved in 107 OER projects

2013-2016
56% of projects with MOE officers as co-researchers
248* schools involved in 55 OER projects

* 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, policymakers 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).
Researching Education for the Future

• Can changes in Singapore education rapidly raise the capacity for innovation and entrepreneurism?

• 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).
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.

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
## Economy, Society, Workplace

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