

Recent Developments in Singapore's Education System: Gearing Up for 2015

INTRODUCTION

1. Singapore's education system evolved from the British education system. It provides 6 years of primary education and 4 to 5 years of secondary education. Students progress to post-secondary education along either an academic, applied-oriented or vocational pathway, before pursuing their university education. (Refer Annex for overview of Singapore's education system.) We have a small school system, with around half a million students enrolled in 351 public schools and a teaching force of 28,500 teachers. There are around 140,000 students enrolled across 3 publicly-funded Universities, 5 Polytechnics and the Institute of Technical Education. A new publicly-funded university will be established in 2015.

STRATEGIC DIRECTIONS IN SINGAPORE EDUCATION

2. At the 2007 IELD conference, MOE highlighted five key directions for the Singapore education system. These are summarised as follows:

a. Creating a More Diverse Education Landscape. To date, we have introduced new education pathways and curricular options to provide different learning experiences for students. Specialised schools, such as the NUS High School of Mathematics and Science, the School of the Arts, Singapore Sports School have been set up to cater to the needs of students with specific inclinations and strengths. In 2010, we will be establishing a new School of Science and Technology. In terms of curricular options, students have been offered a wider range of subjects, including new examinable subjects like Business Studies and Drama; and elective modules for example Aeronautical Engineering, Digital Animation and Mechatronics.

b. Providing Engaging and Holistic Learning Experiences. Across the board, schools are providing more engaging and holistic learning experiences for our students. MOE initiated the "Teach Less, Learn More" (TLLM) movement in 2005 as a call to all educators to engage our learners better and prepare them for life. Under the TLLM initiative, more time and space have been freed up within the curriculum to allow schools and teachers to better customise what and how they want to teach to their students. Schools are also given resources to customise and implement their school-based curriculum and programmes. Teachers are encouraged to leverage on Info-Communications Technologies (ICT) to deliver an engaging curriculum to their students. A key enabler is the Research Activist Scheme to build in-house research expertise within

schools which embark on the TLLM journey. By 2009, about two thirds of schools would have come on board the TLLM movement.

c. Leveling Up Opportunities through Education. Education is a key social leveller and sustains social mobility. MOE is committed to investing heavily in education so that every child, regardless of his background, is given a quality education. We have enhanced our intervention programmes such as the Learning Support Programme (LSP) for Primary 1 and 2 students, designed to help academically weaker students catch up in their literacy skills.¹ Through various financial assistance schemes, we also ensure that students from low-income families have access to quality education.

d. Inculcating a Global Outlook among Our Student. To prepare young Singaporeans for a global future, we aim to give our students greater opportunity to learn about other countries and cultures from young. Opportunities are currently available for students to be involved in exchange programmes with overseas schools, extended immersion programmes in an foreign country as well as learn foreign languages that will allow them to engage the region and beyond.

e. Building a World Class Education Service. The success of our education system would not be possible without dedicated, high-quality teachers and school leaders. MOE is committed to keeping the teaching profession attractive, through competitive salaries, as well as providing professional development opportunities for teachers to ensure that the teaching profession keep pace with the changing needs of the students.

Our broad strategic directions outlined above remain.

TOWARDS 2015 AND BEYOND

3. In the area of curriculum, pedagogy and assessment, MOE has recently embarked on an envisioning exercise to help meet the needs of the future. In regard to this, a project team, the Curriculum 2015 ("C2015") Committee, was set up. The C2015 team visited education systems abroad, and surveyed a broad spectrum of people, including educators, parents and industry employers, to glean insights that would inform the review.

¹ In 2007, an enhanced Learning Support Programme (LSP) for Primary 1 students was implemented. The enhanced programme placed greater emphasis on skills that can be transferred to other subjects e.g. alphabetic knowledge and reading comprehension skills. Research has shown that the enhancements have been effective. 65% of students in the LSP were discharged by end of Primary 2, compared to a 40% discharge rate previously.

C2015 GUIDING PRINCIPLES

4. The C2015 committee has also evolved a set of principles to guide us in our thinking about *what* to learn, and *how* to learn, namely:

- a. **Strong fundamentals.** High standards of knowledge, skills and values are maintained, especially in key areas such as languages, mathematics, science, humanities and physical well-being.
- b. **Future orientation.** The curriculum is reviewed on a regular basis and incorporates future learnings for students to live and work as fully-functioning adults.
- c. **Broad-based and holistic curriculum.** Students access learning in the cognitive, moral, social, moral, physical and aesthetics domains.
- d. **Finer customisation of learning.** Curriculum, pedagogy and assessment are customised according to our students' profiles, interests, abilities and talents so that they can maximise their individual potential.
- e. **Challenging and enjoyable learning.** Learning is a positive and fulfilling experience for all students as they learn in and outside the classroom. There is high expectation for all and strong teacher-student relationships. The curriculum stretches capable students and scaffolds less able students to enable them to experience success.

5. The vision derived for C2015 is ***Strong Fundamentals, Future Learnings***. We advocate a "Tight, Loose, Tight" approach to operationalise the vision. This means a clearly defined educational philosophy in school leadership, clear strategic intents and direction to guide the national and school-based curriculum; school autonomy to innovate at school and classroom level; and a comprehensive mechanism to evaluate if students have acquired the strong fundamentals and are prepared for future learnings, and to ensure school accountability.

6. Based on reviews undertaken in various areas, MOE has identified the following key priority areas going forward. These are:

- a Primary education
- b ICT Masterplan
- c Developing the next generation school team

REVIEW OF PRIMARY EDUCATION

7. Primary education forms the foundation for future learning, providing our pupils with a broad-based education. MOE is currently exploring measures to enhance holistic learning. In particular, we seek to ***strike a better balance between equipping our pupils with foundational knowledge and developing in them the skills and values that will prepare them for life.***

8. To achieve this, MOE will focus on a few prongs to achieve a more balanced primary education, namely:

9. **Review of teaching and learning strategies.** In the coming months, the MOE will review the teaching and learning strategies in primary schools based on our desired student outcomes, so as to provide more platforms to effectively develop key life skills and inculcate values in our pupils. These strategies could include the use of innovative pedagogical approaches in the classrooms such as group work and oral presentation and out of the classrooms such as drama and outdoor education. As part of the review, we plan to consult various stakeholders including school leaders, teachers, parents, pupils and the public, to seek fresh ideas on how to enhance primary education.

10. **Providing more co-curricular activities for all primary school pupils during curriculum time.** More opportunities will also be provided for all primary school pupils to participate in Co-Curricular Activities (CCAs) as a means to promote leadership, inculcate values, develop character and hone life-skills. We will look into providing CCAs for all primary school pupils, with the possibility of introducing modular CCAs for Primary 1 and Primary 2 pupils within curriculum time. This broad exposure will help pupils identify their interests and talents earlier, and help them develop 'softer' skills.

11. **Single session structure for all primary schools.** To provide a more holistic learning experience for our children, teachers will require more time to make use of innovative pedagogies to instruct and interact with each pupil. In turn, pupils will also need more time to practice and develop the skills taught. MOE will study ways to create more time and space for each pupil to benefit from the broader learning experience.

12. One strategy under serious consideration is to increase our investment in school infrastructure so that all primary schools may start lessons for all levels in the morning (i.e. what we call a "single session structure"). In Singapore's context, a typical primary school has a student enrolment of around 1500. 60% of our primary schools conduct lessons for students with some grades (especially the lower grades) in the afternoon, using the same classrooms and facilities which are shared with students from the other grades in the morning. This poses a significant constraint in terms of the classroom time available to teachers and pupils. We believe that operating schools at single-session will enable schools to provide a better environment to develop their pupils more holistically, as they have more time and space to plan and accomplish what they want to achieve for their pupils' education.

13. A single-session structure will allow for more time and flexibility in organising the school day. Pupils can benefit from more contact time with their teachers and higher quality teacher-pupil interaction. It will also allow teachers to use the classroom environment more fully to achieve learning outcomes, without being constrained by having to cater to pupils from different levels sharing the same classroom. Furthermore, school will be able to set a common time for greater professional exchange. Teachers from all levels can interact and learn from one another to raise the level of instruction, and allow for seamless mapping of curriculum and teaching strategies from Primary 1 to 6.

ICT MASTERPLAN 3

14. The second key priority area is the ***use of infocomms technology (ICT) for promoting life skills and mindsets***, such as risk-taking, innovation and problem-solving. Our belief is that ICT has to be employed *judiciously* in order to equip our students with the necessary skills and dispositions to stimulate creativity and thinking skills that will prepare them better for the future.

15. The first ICT Masterplan was launched in 1997 - when MOE revamped the national curriculum to reduce content and increase emphasis on process skills and citizenship education - to bring about a change in mindset in learning.

16. Masterplan 1 laid the foundation by providing all schools with basic infrastructure such as hardware, computer laboratories and essential learning software packages. More importantly, it trained all teachers with basic skills in the use of word processing and presentation software to begin the process of integrating ICT into their lesson plans. We adopted a centralised approach in the early years, as ICT infrastructure in schools was lacking and a significant proportion of teachers were still not comfortable using ICT.

17. MOE also adopted a different approach to the training of teachers. We recruited 60 Senior ICT instructors from our schools, educators who shared our goals of the benefits of ICT and were role models themselves. Rather than train a few teachers from each school at a time, we sent teams of instructors to each school. Each teacher received at least 30 hours of training. Targets were also set for all schools to have ICT-enabled lessons for up to 30% of curriculum time.

18. The approach of scaling up ICT competence among the entire teaching force laid a strong foundation for Masterplan 2 which started in 2002 where we sought to deepen the integration of ICT into daily lessons in schools. It went beyond just using Powerpoint presentations. We wanted instead to bring about greater interactivity and engagement in the learning process.

19. With a basic infrastructure present in all schools, we then provided greater autonomy for school leaders to decide how best to integrate ICT into teaching and learning based on the specific needs of their students. Baseline ICT Standards for students were also introduced last year, and spelt out the specific

competencies that students should achieve at certain milestones, ranging from basic typing skills by 3rd grade to application of data for scientific investigation by the 10th grade.

20. Some schools have used ICT to take teaching and learning to a different level and ventured into alternative pedagogies such as inquiry-based learning and problem-based learning. Students have been able to expand their learning horizons through exploring virtual worlds such as Second Life and educational games such as Quest Atlantis. They are also able to demonstrate what they have learnt through blogs, wikis, podcasts, e-portfolios, animations and video production. Class outings have been enriched by mobile learning such as the development of e-trails, the use of dataloggers, PDAs and mobile phones.

LESSONS LEARNT FROM OUR JOURNEY IN ICT

21. In the process of our journey in ICT, we have gained valuable lessons, as follows:

a ***A gap continues to exist between familiarity with ICT and translating this into effective teaching.*** Over 30% of our teaching force is below the age of 30, and ICT-savvy. However, teachers still need to base effective outcomes on sound pedagogical principles when they use ICT tools to bring out a learning point.

b ***The need to strike a balance between centralisation and autonomy.*** Autonomy for schools and teachers increased ownership and encouraged more bottom-up innovations. We must not diminish the motivation for individual schools to find better teaching methods using ICT but at the same time we need to address the unevenness in the quality of execution across schools. Autonomy can also lead to less efficiency. While each school might customize its learning resources for different groups of students, it may not be necessary for every school to buy its own electronic learning management system or manage its own infrastructure. It is important to identify areas where economies of scale and standardization are advantageous, such as infrastructural provisions and capability building for teachers. Our approach is to maintain a light touch and allow schools to be the main driver of ICT efforts.

NEXT STEPS –MASTERPLAN 3

22. These experiences will serve us well in our next phase, which is mapped out by the ICT Masterplan 3. Masterplan 3 was unveiled this year, and represents a continuum of the vision of Masterplans 1 and 2: to transform the learning environment for our students. We want greater engagement of students to encourage more self-directed questioning and learning. Masterplan 3 seeks to fulfil the following goals so as to improve learning outcomes:

a Equip our students with the critical competencies and dispositions to succeed in a knowledge economy. One example is to strengthen competencies for self-directed learning. In order for students to discriminate information, they must have technological literacy, higher-order thinking skills and even life and collaboration skills. The appropriate use of ICT can help develop many of these competencies.

b Tailor learning experiences according to the way that each student learns best. The stronger the ability of teachers to recognise how each student learns and where he or she has difficulty in, the more effective they can tailor their teaching for better learning outcomes. For example, students studying the same topic could use different learning resources or quizzes and tests that are better customised to that individual student. To enhance the ability of teachers, we will train a pool of "ICT specialist teachers" with strong pedagogical groundings to model and lead professional development efforts within and across schools. We are developing a learning roadmap, to help pace teachers in learning how to effectively use ICT in their classes.

c Encourage students to go deeper and advance their learning. For those who can and want to go further in any subject, ICT is a powerful adjunct to learning. For instance, technology allows scientific concepts like atomic structures or protein structures to be better understood using 3-Dimensional representation, as compared to traditional 2-Dimensional representation. The use of tools such as data loggers can help automate laborious operations such as data collection and graph plotting, thus freeing up time for more important data analysis and design of experiments. Subjects and topics in the humanities, which are currently limited to the use of print sources, can now include video and audio sources. This produces a more authentic reconstruction of events which allows students to better appreciate different perspectives and produce more nuanced analyses.

d Learn anywhere, anytime. The use of ICT allows such mobility and flexibility in learning, freeing it from the physical confine of classrooms and the rigidity of structured curriculum time.

23. These four goals are an expression of our desired end state. To achieve them, we will need to integrate ICT during planning and design of lessons plans, focus on improving the capabilities and skill sets of our teachers, improve the sharing of best practices and successful innovations across schools, and further build up infrastructure to maximise the potential of ICT. These strategies are work in progress, and will be implemented in the coming years.

DEVELOPING THE NEXT GENERATION SCHOOL TEAM

24. The third key priority area which has seen new strategies being formulated is the enhancement of the school workforce. Achieving our desired outcomes in education will require high quality teachers and administrative staff in schools. Singapore currently has 28,500 teachers, and we are on track to meeting our target of 30,000 by 2010.

25. High-performing education systems around the world have teachers with high qualifications. Over the last few years, the percentage of graduates among our newly recruited teachers has averaged at 69% in our primary schools and 92% in secondary schools. At the same time, an increasing number of non-graduate teachers have also upgraded their qualifications and obtained their undergraduate degrees in-service – from 256 in 2004 to 364 in 2008. At present, 55% of our primary school teachers and 91% of our secondary school teachers are graduates.

26. Past experience has shown that the growing number of graduate teachers in primary schools have helped to raise standards. In the coming months, we will explore the strategy of requiring all new teachers to have degrees as minimum qualifications.

27. While the content knowledge and learning skills acquired through the additional years of university study is an asset, our teacher selection process will look beyond academic credentials. We will continue to assess whether potential teacher candidates have an aptitude for teaching and whether they have a heart for nurturing young people.

28. In addition, high quality teaching requires a good mastery of curriculum, pedagogy and assessment. Emphasis will also be placed on professional development to ensure that we continuously equip teachers with the knowledge and pedagogical skills to effectively teach content and cultivate life-skills and values. They must be able to respond to students who question more and who may learn better through self-discovery and an exchange of views.

29. MOE has recently introduced a new career scheme called the Allied Educators Scheme (AES) - to attract, motivate and retain good quality people to be Allied Educators (AEDs). This is a group of para-educators, comprising Full-Time School Counsellors, Special Needs Officers and Education Associates. While teachers remain overall responsible for the total development of students, these allied educators will co-teach with teachers, assist teachers in providing pastoral care, cater to students with special needs, assist with managing co-curricular activities or undertake a mixture of these duties.

CONCLUSION

30. These strategies have been adopted since the last dialogue to position our education system to better meet the needs of our students. Going forward,

the demands on Singapore's education system to meet the needs of a rapidly changing global landscape will continue to grow. We will continue to take stock at regular intervals and take appropriate measures to ensure that our education system meets Singapore's social and economic manpower needs in the 21st century.

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