THEMATIC PROBE. Primary Education: an International Perspective

Country Description: Singapore

Note: This country description was compiled from the *INCA* Archive (www.inca.org.uk). Additional comments were received from Mdm Sharon Boey, Head of Humanities and Aesthetics in the Curriculum Planning and Development Division of the Ministry of Education in Singapore.

1. Organisation of school phases:

How are the early years and primary phases organised? (3-5yrs? 5-11yrs?)

There is an average of ten years of formal general education in Singapore. This commences in the January of the year in which a child reaches the age of seven (the school year begins on 2nd January each year and runs until December), and comprises six years of primary school education and four years or more in the secondary sector.

This education is currently universal, but not compulsory. Six years of primary education will become compulsory from January 2003 (subject to certain exemptions, for some children with special educational needs for example).

Prior to starting primary school, most children attend some form of pre-school education, at least between the ages of three and six/seven years, either in a kindergarten or childcare centre.

Primary sector education caters for children aged six/seven to 12, in primary schools or in *full schools*, which take children aged six/seven to 16 years.

The primary sector is divided into two cycles or stages:

- the foundation stage (Primary One to Primary Four, aged six/seven to 10 years), which aims to provide children with "a firm foundation in English, their mother tongue ([Mandarin] Chinese, Malay or Tamil) and mathematics"; and
- the orientation stage (Primary Five and Primary Six, children aged 10 to 12 years), during which children are placed in three, sometimes four, different streams according to ability (EM1, EM2, EM3 and ME3), designed to prepare them for the secondary sector course best suited to their abilities.

What are the points of transfer between phases?

Early years education	Primary education		Secondary education
3-6 years of age	Foundation stage, Primary 1 - 4 6/7 - 12 years old	Orientation stage Primary 5 - 6 10-12 years old	12 - 16/17 years old

2. Locus of control

What degree of control over curriculum content and other aspects of primary schools exists at the national, regional, local, or school level?

The educational structure, national goals for education, and the education programme for the whole country are determined by the national Ministry of Education (MOE). However, autonomy is devolved to schools to take control of the planning and delivery of instructional programmes and the adoption of teaching methods to meet the needs, abilities and interests of their students. This is done within the framework of the parameters and guidelines drawn up by the MOE.

State education is free for Singapore citizens and all schools in the education system receive public funding; the level of funding depends on school type. *Government schools* are fully funded by the Government. *Government-aided schools*, set up by religious organisations, receive 90 per cent funding from government for their development costs. The recurrent costs of *government-aided schools* are also borne by the Government.

Curriculum and assessment

Singapore has a centralised system of curriculum design and assessment. That is, the Ministry of Education (MOE) has overall responsibility for the curriculum and assessment.

In terms of the curriculum, the MOE sets out the policy objectives of the teaching and learning of the various subjects in the curriculum and designs the subject syllabuses. For each subject, the subject syllabus outlines in detail the rationale and specific objectives for teaching the subject at the primary level. These are accompanied by the curriculum framework, in which the lists of content topics are integrated across each Grade/Year level. In addition, guidelines and suggestions on the methods of teaching are highlighted, together with a clear statement of the intended standards of achievement. The syllabus then concludes with a suggested list of texts and available instructional resources. The MOE is also responsible for the ongoing review and systematic revision of the national curriculum in Singapore.

With regard to assessment, in addition to setting standards of attainment, the MOE is responsible for the administration of the Primary School Leaving Examination (PSLE). All children in mainstream schools take this national examination at the end of primary education.

Are there any shifts in the distribution of control between these different levels? (Is it possible to assign percentages to each level, to reflect circumstances in each country?)

As mentioned above, some autonomy has been devolved to schools to take greater control over the planning and delivery of instructional programmes within the broad framework and parameters defined by the Ministry of Education (MOE).

As part of this move to give schools more autonomy and to foster an environment that facilitates the implementation of new ideas within a collaborative network, the MOE

has also started to create school 'clusters'. Each cluster of 13 to 14 member schools [1] is managed by a cluster superintendent, on whom the Ministry of Education confers greater authority than would normally be the case at this level.

At what intervals is the curriculum reviewed? (eg are there established review cycles?)

The school curriculum in Singapore undergoes continual revision and refinement.

The Ministry of Education undertakes systematic curriculum review as part of a process of ensuring that the curriculum is responsive, future-oriented, remains relevant in the context of Singapore's economy, and meets the needs, abilities and interests of students. To facilitate this process, the curriculum planning and review process has been reduced from an eight- to 10-year cycle to a six-year cycle incorporating a mid-term review at the end of the third year. This involves a detailed study of the subject syllabuses, teaching approaches and the modes of assessment to align these with national policies and emerging trends.

In recent years, to ensure alignment of the curriculum to the initiatives in National Education (NE), Thinking Skills and Information Technology (IT), introduced in 1997 (see below), curriculum review was carried out in two stages. The first stage was the reduction of curriculum content. The second stage of the review was the integration of these initiatives into the syllabuses when the latter were revised as part of the curriculum review cycle. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

3. Curriculum content

What does the statutory curriculum consist of?

The primary curriculum is intended to build a foundation in literacy, numeracy, character formation, and social and emotional skills development.

Primary One to Primary Four

The foundation stage of primary education - Primary One to Primary Four, children aged six/seven to 10 years - focuses on a core curriculum of:

- English;
- the mother tongue ([Mandarin] Chinese, Malay, or Tamil) (known as CMT);
- mathematics;
- music;
- art and crafts;
- civics and moral education (CME); and
- physical education.

In addition, science is introduced in Primary Three, children aged eight/nine onwards. Children also study social studies.

[1] Some clusters consist entirely of primary schools, some entirely of secondary schools and some include a mixture of primary and more senior schools.

The learning of English in Primary One to Primary Four (children aged six/seven to 10+ years) also includes general topics such as health education.

The study of the mother tongue includes civics and moral education (CME), as it is felt that core Asian values are most effectively and appropriately transmitted through the mother tongue language medium.

Primary Five and Six

In Primary Five and Primary Six (the orientation stage, children aged 10+ to 12 years), the subjects studied are:

- English;
- mother tongue (Chinese, Malay or Tamil, CMT);
- mathematics;
- science;
- social studies;
- art and crafts;
- music;
- physical education (PE); and
- civics and moral education (CME).

Children in all the four streams of the orientation stage (EM1, EM2, EM3 and ME3) study essentially the same curriculum, except that they are taught at different levels of complexity. EM1 children, for example, study mother tongue at the first language (higher) level; EM2 children study mother tongue at second language level and those in EM3 study mother tongue at basic level. In EM3 a modified curriculum is provided for English, mathematics and science, focusing on core content and skills. The emphasis is on achieving the required proficiency in English and mathematics. In the ME3 stream, which is only provided where there is sufficient demand, mother tongue is taught to first language (higher) level and English to basic level.

See the summary table which follows.

Subjects taught in Singapore primary schools

Foundation Stage (Primary 1 – 4) (6/7- to 10-year-olds)	Orientation Stage (Primary 5 – 6) (10+- to 12-year-olds)
English language Mother tongue (Chinese, Malay or Tamil, CMT) Mathematics Science Art and crafts Music Social studies Civics and moral education (CME) Health education Physical education (PE)	English language Mother tongue* (Chinese, Malay or Tamil, CMT) Mathematics Science Art and crafts Music Social studies Civics and moral education (CME) Health education Physical education (PE)
Notes The study of science is introduced in Primary Three (children aged eight/nine onwards). The study of health education topics is included in the learning of English language during this stage of primary education. Some English language teachers set aside a period per week specifically for health education. Civics and moral education (CME) is delivered in the mother tongue language. On average, over the four years, 32 per cent of curriculum time will be spent on English language, 26 per cent on the mother tongue, 20 per cent on mathematics and the remaining 22 per cent on the other subjects.	**Notes** Civics and moral education (CME) is delivered in the mother tongue language. * Studied at varying levels depending on the stream. Children in EM1, for example, study the mother tongue at a higher level.

(Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

What other aspects of the curriculum/teaching in schools are statutory? Are time allocations for subjects statutory?

Bilingualism

The study of English *and* the mother tongue throughout primary level education reflects and stresses the importance of being bilingual in a multiracial society, and aims to guarantee that children are equipped with the basic skills of literacy and numeracy to function in a modern industrialised economy.

Civics and moral education (CME)

Civics and moral education (CME) is an integral part of the formal curriculum (see above) as well as part of extra curricular activities (co-curricular activities (CCAs, see below). For instance, as part of the CME programme, all students in primary to post-secondary pre-university level education are required to participate in a 'Community Involvement Programme' (community service, see below also) for at least six hours in each year. The aim of this programme is to "nurture students to be socially responsible and to help them understand that every Singaporean has a role in enhancing the well-being of the community and the country".

Co-curricular (extra-curricular) activities (CCAs)

The CCA programme forms an integral part of the education system in Singapore. Sports is a major component of schools' CCA programmes, along with uniformed groups, music and dance, and various clubs and societies. CCAs aim to engage children in a meaningful way; provide opportunities for character and leadership development; and promote the acquisition and application of social and cooperative skills. On average, children attend CCAs once a week, with some attending twice a week.

While the academic development of children is considered as important, parents and teachers are encouraged not to overlook the fact that purposeful participation in CCAs provides a good balance to academic pursuits in schools; CCAs provide children with a well-balanced life and holistic education.

Core skills and values

There are eight core skills and values:

- literacy and numeracy;
- information skills;
- thinking skills, problem solving and creativity;
- communication skills;
- social and cooperative skills;
- knowledge application skills;
- self-management skills; and
- character development,

which, along with information technology, are infused into subjects across the curriculum.

Time allocation

Within general guidelines regarding time allocation per subject per week for all levels and streams of education, schools have some flexibility to deviate slightly to meet the needs of their students.

In Primary One to Primary Four, children aged six/seven to 10 years, time allocation per subject is roughly as follows:

English	33 per cent
Mathematics	20 per cent
Mother tongue (Chinese, Malay or Tamil)	27 per cent
Other subjects (e.g. art and crafts, music, PE)	20 per cent

Curriculum, Primary One (P1) - Primary Four (P4), aged 6/7 - 10 years

Subjects	**No. of 30-minute lessons per week**			
	P1	**P2**	**P3**	**P4**
English, including health education and information literacy	17	17	15	13
Chinese/Malay/Tamil including civics & moral education (CME)	15	13	12	11
Mathematics	7	9	11	11
Science	-	-	3	4
Social studies	1	1*	1**	2
Art & crafts	2	2	2	2
Music	2	2	2	2
Physical education	3	3	3	3
Assembly	1	1	1	1
TOTAL	**48**	**48**	**49**	**49**

* Began in 2001.

** Began in 2002. The time is taken from either English language or mother tongue lessons.

Curriculum, Primary Five-Six, by stream (EM1/EM2/EM3), aged 10-12 years

	No of 30 minute lessons per week		
	EM1	**EM2**	**EM3**
Examination Subjects: total	**36**	**36**	**36**
English, including information literacy skills	12	13	16
Chinese/Malay/Tamil	10	8	4
Mathematics	9	10	13
Science (not an examination subject at in the Primary School Leaving Examination [PSLE] in EM3)	5	5	3
Non-Examination Subjects: total	**13**	**13**	**13**
Civics & moral education (in mother tongue)	3	3	3
Social studies	3	3	3
Art and crafts	2	2	2
Music	1	1	1
Physical education	2	2	2
Health education	1	1	1
Assembly	1	1	1
TOTAL	**49**	**49**	**49**

Are there statutory timings for the length of the school day/week?

The school year consists of four 10-week terms beginning on 2nd January each year. There is a one-week vacation after the first and third term, a four-week vacation mid-year and six weeks at year end.

Of the 40 teaching weeks of the school year, examinations and other school activities may account for about four weeks of instructional time. Most schools run double sessions, with different groups of students attending school either from 7:30 am to 1:00 pm, or from 1:00 pm to 6:30 pm, Monday to Friday.

What changes have there been to the statutory/non-statutory elements of the curriculum?

In 1997, at the opening of the first session of the Ninth Parliament, the President summed up the Government's educational thinking as follows:

- We must develop our young to think creatively and apply knowledge in innovative ways, while recognising the wide range of abilities among students.
- We will revise the school curriculum to stretch but not overload our students.
- We will reduce the amount of factual knowledge they must acquire and do more to build thinking and processing skills.
- We will review the system of assessment of both schools and students to meet their objectives, while maintaining rigorous standards.

In consequence, with a view to realising the Ministry of Education's vision - *Thinking Schools, Learning Nation* and to meeting the challenge of preparing Singapore's students for the knowledge age, three new education initiatives were introduced:

- a Thinking Skills programme (designed to develop thinking skills and creativity in students);
- an Information Technology (IT) programme; and
- a National Education (NE) programme (which incorporates the teaching of civics, social education, family education, and community/country education).

All three initiatives are infused into the academic and non-academic curricula at all levels of education.

Subject syllabuses were revised in 2001 to reflect the incorporation of the above three initiatives.

Thinking skills

The National Institute of Education has set up the Singapore Centre for Teaching Thinking (SCTT) to provide resources and to undertake research to assist schools in the implementation of the critical and creative thinking initiative. It is training teachers in the teaching of thinking skills. These trained teachers will then be expected to pass their new knowledge on to their teaching colleagues

Information technology, IT

The masterplan for IT in education provides a blueprint for the use of IT in schools, as well as access to an IT-enriched school environment for every child. The masterplan aims to:

- Enhance linkages between school and the world around it so as to expand and enrich the learning environment.
- Generate innovative processes in education.
- Enhance creative thinking, lifelong learning and social responsibility.
- Promote administrative and management excellence in the education system.

The masterplan focuses on provision of the supporting physical and technological infrastructure, learning resources, teacher training, and curriculum and assessment, and is accessible at http://www1.moe.edu.sg/iteducation/masterplan/welcome.htm.

As a result of the masterplan, all schools have been networked and provided with computers for teachers and students. Schools have also been enabled to acquire and develop a wide range of educational resources to meet curriculum needs, and to infuse the use of IT into teaching and learning. Evaluations conducted by the Ministry of Education (MOE) have revealed that students find that the use of IT makes learning more interesting, encourages them to learn beyond the curriculum and allows for greater interaction among students. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

National Education (NE) programme

National Education (NE) places a premium on responsible citizenship and is integrated into different subjects and incorporated in many school initiatives. The programme was introduced to strengthen national cohesion and confidence in the future. In schools, distinct strategies for NE are required at different education stages, in line with the intellectual and emotional maturity of the students. At the primary level, children are encouraged to *Love Singapore*; while secondary students are taught to *Know Singapore* and pre-university students are urged to *Lead Singapore*. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

As mentioned above, NE is not a formal subject in its own right but is infused across subjects in the curriculum. However, a core group of subjects has been identified as being especially suited to the delivery of NE messages and the inculcation of NE values. At the primary level, these subjects are social studies and civics & moral education (CME). NE-related activities are organised to imbue values and attitudes through experiential learning. Children participate in the commemoration of key historical events, for example, or in learning journeys to institutions and organisations that bear witness to Singapore's development. Methods that work well for NE are open and active dialogue on controversial issues; close home-school collaborations; and a variety of meaningful community involvement activities through the 'Community Involvement Programme' (CIP), see above. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

What government/other initiatives have been introduced? What has been their impact?

The introduction of the three initiatives, National Education, Thinking Skills and Information Technology (see above) has impacted on teaching and learning in all Singapore schools. These initiatives have been infused in the syllabuses and instructional materials. Appropriate strategies have been adopted to support the delivery of National Education; and teaching methodologies have changed to generate critical and creative thinking and encourage independent learning. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

Learning Support Programme (LSP)

The LSP is an early intervention language and literacy programme, first introduced in primary schools in 1992, to provide additional support to children in Primary One (P1) and Primary Two (P2) (aged six/seven to eight/nine years), identified as educationally 'at risk' of failing in school. Each year, between 10 and 15 per cent of P1 and P2 children are supported in LSP. The LSP is implemented in all primary schools. Schools are provided with an additional teacher, allowing children in the LSP to be taught in small groups of between eight and 12 members. In many schools, there is a specific or purpose-built classroom for LSP.

On average, LSP children start school at P1 with limited reading skills, equivalent to children of less than five years of age. In 2001, after 10 months of intervention in LSP, the average reading age of LSP children increased to seven years; almost on a par with the rest of the P1 cohort in terms of their reading skills. It is generally accepted that these improvements in reading carry over to the classroom and increase children's ability to learn new materials. This is reflected in the improvement in pass rates of children in the LSP. For example, in 2001, less than half (45 per cent) of P1 LSP children passed the mid-year examination in English. By the second semestral examination at the end of the year, the pass rate was 65 per cent.

At the end of P1, 60 per cent of LSP children are discharged from the programme. The remainder continue to receive support in P2. The Ministry of Education (MOE) is of the opinion that the LSP is currently obtaining results that are close to optimal. As a result, instead of extending the LSP to Primary Three, the Ministry intends to focus resources on introducing an LSP for mathematics, as this has been identified as an area of need by schools.

As a result, in 2002, the LSP for mathematics was introduced to around 50 schools on a pilot basis. These schools are provided with an additional teacher to implement the programme. A two-year study is underway to determine the optimal model of implementation for the LSP for mathematics. If proven successful, the programme will be rolled out to all schools in phases.

Character development programme

Introduced in 2001, the character development programme aims to guide schools in providing a balanced programme for each student in three domains: leadership, citizenship, and personal and social development. Activities in the leadership domain are designed to provide opportunities for students to "lead as they serve and to serve as they lead". Under the citizenship domain, activities are organised to help students acquire values such as loyalty and commitment to nation. In the social and personal domain, students are exposed to activities that heighten their awareness of self and the relationships with others.

The programme was introduced in view of the fact that technological advancements have brought with them knowledge explosion and easy access to ideas and influences – both good and bad. In addition, globalisation provides opportunities for uprooting. Character education (values education) aims to ensure the holistic education of the whole child with an emphasis on strengthening the instincts for the community and

the nation. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

One approach adopted for the teaching of this programme has been direct instruction through relevant subjects and programmes, such as the National Education programme (see above) or through subjects such as social studies and civics and moral education (CME). A second approach has been through the curriculum as a whole. For example, in primary education, children develop, through science, a concern for living things, and an awareness of the responsibility they have for the quality of the environment. Through physical education, sports and games, endurance, sportsmanship and fair play are nurtured. Through the arts, children learn to appreciate local and ethnic art and music and develop a sense of pride in their national and cultural heritage. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

PRIME

A Programme for Rebuilding and Improving Existing Schools (PRIME) is also being implemented from 1999 to 2005. This aims to rebuild or upgrade a total of 290 schools by the year 2005, providing improved facilities such as computer laboratories, media resource libraries, IT learning resource rooms, pastoral care rooms, health and fitness rooms, and bigger classrooms, staffrooms and 'interaction areas'.

What other trends are emerging in curriculum development? (eg new subjects/areas of learning being introduced)

Curriculum design has shifted to achieve a better balance between mastery of content and process skills, and to recognise the contribution of each discipline to the development of values and positive attitudes. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

See also section 7. Pedagogy, for information on Project Work (PW).

What other levers may be having an impact on curriculum content? (eg international studies: PIRLS, IEA, PISA, TIMSS)

The results of TIMSS have not had any specific impact, other than to provide an objective measure of the system of mathematics and science education in Singapore and an affirmation of the quality of the system. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

4. Organisation of the curriculum

What are the common features of curriculum organisation in the primary phase? (single subjects? planning subjects as 'topics'?)

See section 7. Pedagogy, for information on Project Work (PW).

How are subjects labelled?

What examples are there of 'areas' rather than subjects?

What examples are there of clusters of subjects (eg Humanities, made up of geography and history) being brought together?

As previously mentioned, the learning of English also includes general topics such as health education, information literacy and social studies.

The study of the mother tongue includes civics and moral education (CME) because it is felt that core Asian values are most effectively and appropriately transmitted through the mother tongue language medium.

History, geography and society are taught as social studies.

What are the common features of timetabling? (eg weekly lessons in each subject, English and mathematics taught daily)

In timetabling, schools have the flexibility to institute blocks of time to support teaching and learning. For example, 12 periods of English each week could be organised as short blocks of one to two periods and longer blocks of two to four periods. These longer blocks might effectively be used for composition writing activities for example. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

In addition, schools plan and coordinate their instructional programmes on an annual basis to set aside time for subject events and activities (such as 'English Week', a social studies field trip, 'Mathematics Fortnight' or 'Healthy Lifestyle Month'). These special events can take place during or outside formal curriculum time. Cross-departmental planning is also carried out for interdisciplinary tasks such as Project Work (PW). (Further information is provided in section 7. Pedagogy.) (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

5. Assessment

What is the purpose, nature and scale of assessment? (eg end of phase assessment, statutory, published test results, optional, national, local, timed tests, teacher-assessment)

Apart from the national examination for this phase - the Primary School Leaving Examination (PSLE) - all assessment (continuous and twice-yearly tests) is school-based. The Ministry of Education (Curriculum Planning and Development Division) provides schools with guidelines on school-based assessment. In addition, for most subjects, the relationship between curriculum and assessment is incorporated in the syllabus documents. For some subjects such as the English language, the teaching syllabus includes suggestions for informal and diagnostic assessment, while a separate examination syllabus (for the PSLE) specifies the skills to be examined and the allocation of marks for each skill.

Testing at the end of Primary Four

As previously mentioned, children are streamed at the end of Primary Four (the foundation stage), aged around 10 years, for the final two years of primary education. This streaming takes place on the basis of performance in a school-based examination in English, the mother tongue and mathematics.

Primary School Leaving Examination

At the end of the six years of primary education children take the Primary School Leaving Examination (PSLE). This national examination determines access to differentiated courses of secondary sector education according to the individual's learning pace, ability and inclinations.

The PSLE is a formal assessment and children take both written and oral examinations. Those in upper primary streams EM1 and EM2 are generally tested in four subjects: English at the first language level, the mother tongue (Chinese [Mandarin], Malay or Tamil) at second language level (oral and written), mathematics and science. EM3 children usually only take foundation level English, basic mother tongue and foundation level mathematics in the PSLE and are then admitted to the secondary 'normal' (technical) course. Children in the ME3 stream (where one exists) are also tested in three subjects; the mother tongue at first language (higher) level, basic English and basic mathematics.

Stream	**Subjects tested in the Primary School Leaving Examination**
EM1 and EM2	English language, mother tongue*, mathematics and science * Children in EM1 take an additional, higher level mother tongue paper
EM3	Foundation English language, basic mother tongue and foundation mathematics
ME3[2]	Higher mother tongue, basic English language and mathematics

The PSLE is a norm-referenced examination in which attainment is recorded by grades: A*, A, B, C, D, E and U (ungraded). Children are issued with a certificate recording their performance in the PSLE and which serves as evidence of their academic achievements when seeking entry to secondary sector education institutions. Schools receive a summary of their individual school and national results, as well as the detailed results of each child.

Children's performance in the PSLE is also one of the factors used to measure the performance of the school.

School-based continuous assessment

Continuous, formative assessment, which forms an integral part of the teaching-learning process, serves to monitor children's progress in academic studies and extracurricular activities. It often involves such test items as monthly quizzes. There are also two semestral assessments (mid- and end-of-year examinations) which

[2] The ME3 stream is only provided if there is sufficient demand for it.

provide a summative evaluation of an individual child's learning during the preceding half-year. Scores from these two forms of assessment are aggregated (suitably weighted) to offer a profile or index of the child's progress over the school year, and form the basis on which children are placed on, and progress through, the different courses of study. The scores also constitute one of the sources of feedback that are used to counsel children at annual teacher-parent meetings.

The profile of each child's progress in the first years of school, which all primary schools maintain, is used, at the end of Primary Four (children aged 10+), as the basis on which to stream them for their future academic career. Children are grouped according to their level of performance in English, the mother tongue and mathematics. Parents are informed of their child's aptitude for the various academic subjects and are further advised on possible educational paths for them. The final decision on the stream best suited to the child rests with the parents. However, if, after a year, a child fails to reach the required standard, he/she may be transferred to a lower stream for the final year of primary level education. The different streams are designed to prepare children for the secondary sector course best suited to their abilities.

In general, children do not repeat classes during the foundation stage (Primary One to Primary Four, aged six/seven to 10+). They may repeat the Primary Five year if the school or parents deem this necessary. This is generally the only occasion (unless there are exceptional circumstances) when primary school children repeat a year.

How far is the curriculum driven by assessments? (eg evidence of teacher preparation for testing, 'booster' or 'catch-up' classes in schools)

Assessment has changed in tandem with the increased emphasis on thinking and process skills in teaching and learning (see Section 7). Assessment modes have been expanded to stimulate thinking, elicit problem-solving behaviour, collaboration in groups and effective communication. The range of assessment modes includes pen-and-paper tests, project work, portfolios, practical work and oral presentations. In addition, questions are designed to elicit higher order thinking. For example, in primary level social studies, open-ended questions require children to assess and evaluate information, leading to the generation of potentially different, but correct answers. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

6. Teaching profession/training

What changes can be identified in initial teacher training programmes?

The National Institute of Education (NIE) provides initial teacher training programmes. The NIE and divisions of the Ministry of Education (MOE) are in constant dialogue about curricular changes and the implications for initial teacher training programmes. In recent years, in tandem with the MOE's directions and initiatives, the NIE has introduced and strengthened modules on thinking skills and creativity, organisational learning approaches and building effective relationships

with stakeholders. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

In support of the National Education (NE) initiative, see above, elements of NE have also been introduced to initial teacher training in the form of seminars and talks. This is with a view to sensitising would-be teachers to the issues and challenges Singapore faces. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

In relation to information technology (IT), the NIE has aligned its initial teacher training programmes to ensure that trainee teachers have core skills in teaching with IT resources. The measures taken include the effective infusion of IT into the NIE's own curriculum, the training of academic staff in the use of IT and the provision of ready access to IT tools and related resources for all trainee teachers. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

What kinds of continuing professional development/on-going training are provided?

Generally, teachers are entitled to a recommended minimum of 100 hours of continuing professional development each year in order that they stay abreast of content and pedagogical developments. Professional development opportunities include briefings and workshops, local and overseas training courses, seminars and conferences, and attachments to relevant research institutes. Teachers identify their training needs (based on a training framework established by the Ministry of Education, MOE) and select courses that best meet these needs. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

Support for Curricular Change

Curricular change is essentially supported by the provision of teaching and learning resources (see below) to engage children in purposeful learning, and the training of teachers to deliver the new emphases in the curriculum. These forms of support are coordinated and funded by the MOE. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

Training is provided to enable teachers to better understand the rationale for change and to equip them with the knowledge, skills and values to effectively deliver the changes. In recent years, the continuing professional development provided for teachers has focused on the MOE initiatives of National Education (NE), Thinking Skills and information technology (IT) (see above), Project Work (PW, see below), as well as on the introduction of revised subject syllabuses. One example is the English Grammar course, which leads to the attainment of the *Singapore-Cambridge Certificate in the Teaching of English Grammar*. This training was provided for all primary English language teachers to enable them to effectively deliver the revised syllabus which has an emphasis on grammar. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

To ensure the effective implementation of any revised syllabus, all teachers involved in teaching the syllabus at the relevant levels are required to attend the professional development training provided. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

In instances of briefings and workshops relating to the implementation of new initiatives, each school is required to nominate a recommended number of teachers to attend. These teachers then return to their schools to cascade the key learning to their colleagues. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

To what degree are teachers'/schools' planning subject to scrutiny?

In each school, the principal and vice-principal (headteacher and deputy headteacher respectively) work closely with their middle management (for example, heads of department, subject coordinators or heads of year) to plan, implement and monitor instructional and other school programmes. They monitor the implementation of plans through regular lesson observations, the checking of student assignments, and progress reports. In addition, each school is now supervised by a cluster superintendent, one of whose roles is to facilitate the resource planning of schools within his/her school cluster. Overall, the approach taken is participative and developmental. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

How the school and teachers design, implement, manage and improve key processes to provide a holistic education and work towards enhancing children's learning is critically evaluated within the framework of the School Excellence Model (SEM). The SEM is a self-assessment model for all schools and includes a set of standards and rubrics as a guide for self-appraisal. It requires schools to look at critical processes that can influence education outcomes, question current practices and think of more effective and innovative ways of delivering education outcomes. Periodically, the Ministry of Education (MOE) conducts an external validation of each school using the criteria and standards established in the SEM. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

Special programmes are monitored and evaluated by the responsible divisions of the MOE, through regular contact with school personnel involved in programme planning and implementation. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

To what degree are teachers using electronic formats to plan?

The 'IT Masterplan' (see above) has helped to promote the use of IT in education. Schools make use of established IT systems to record and report on children's progress. Teachers also use available lesson building packages to plan their lessons. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

Looking ahead, the School Cockpit System, a web-based school administration system, is being developed for all schools. This will serve to provide an integrated IT

environment to help school staff in their planning, resource management and decision-making, and in managing their students better. It includes modules in lesson planning, timetabling, academic results' management and physical fitness test management, among others. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

7. Pedagogy

Which teaching approaches are dominant or developing a higher profile, and which are receding? (eg collaborative work, whole-class instruction)

In the light of the three new initiatives currently being implemented in Singapore - thinking skills, information technology (IT) and national education (NE) - teaching and learning strategies are beginning to change. There is a gradual move from a teacher-centred to a learner-centred and more interdisciplinary approach.

> Until recently, the most frequent approach adopted by teachers was whole-class instruction with teacher-talk being more dominant. There is now a move towards a more collaborative, learner-centred approach. In this approach, the teacher plays the role of a facilitator to promote thinking and problem-solving skills; encourage children to voice their opinions and to think laterally; and to implement group work teaching strategies to encourage children to take responsibility for their own learning. Collaborative learning strategies, group work and child-led discussions are becoming more widespread, as is the interdisciplinary approach to teaching and learning to help children see the links between topics and across subjects. Teachers achieve this by facilitating and guiding children in learning activities such as interdisciplinary Project Work (PW, see below). (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

There is also a move towards a balance between whole-class, group and individual learning. Within lessons, whole-class learning is complemented by group learning, which allows for the development of collaboration and communication skills. Project Work (PW) is an example of a group learning activity. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

Project Work

Project Work (PW) was introduced in 2000 to provide children with opportunities to explore the inter-relationships and inter-connectedness of subject-specific knowledge. Through PW, children are able to apply creative and critical thinking skills, improve communication skills, foster collaborative learning skills and develop self-directed inquiry and lifelong learning skills. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

In PW, teachers use cooperative learning strategies to promote collaboration among group members. To enable children to become independent learners, teachers encourage them to reflect on their learning and to acquire the habit of self-reflection. At the primary levels, PW is implemented as a learning activity. (Mdm Sharon Boey,

Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

The increasing use of rubrics in the curriculum promotes active, independent learning. Rubrics provide clear descriptors of expectations of learning and the behaviours children should exhibit as a demonstration of their attainment of the expectations. In addition, IT is a powerful tool in empowering children to become active, independent learners. Individual learning is supported through the infusion of IT in teaching and learning and the provision of IT-based learning resources. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

To what degree are teaching approaches focusing on developing thinking skills, creativity and building on children's learning styles?

Focus on information and thinking skills

In the knowledge age, it is crucial that children learn to access information from various sources, organise and analyse information, generate new ideas and perspectives, and make informed and considered decisions. The focus has been shifted from how much children know to what they are able to do with what they know. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

Critical and creative thinking skills have been systemically infused in all subjects in the curriculum to provide more opportunities for children to apply what they have learned to solving problems. For example, in primary mathematics, children are taught to recognise and use mathematical thinking and problem solving strategies, and to apply mathematical concepts to solve problems in everyday life. In primary social studies, children learn to compare and contrast events and places and identify causes, effects and constraints. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

Promotion of interdisciplinary learning

As knowledge is not compartmentalised in the real world, it is becoming increasingly important that children appreciate the inter-connectedness of disciplines and see that what they are learning in the classroom is of relevance to their current or future interests. In order to make the boundaries between subjects more porous, the Ministry of Education (MOE) now makes explicit the links within and between disciplines. It provides opportunities (through Project Work, for example, see above) for children to bring together - via interdisciplinary tasks - the different knowledge and skills they have acquired from different areas of learning. A further example is the revised primary science syllabus. This is based on a thematic approach, which allows for the integration of scientific ideas and enables children to see how topics are linked across the different scientific disciplines through the themes 'Diversity', 'Cycles', 'Systems', 'Interactions' and 'Energy'. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

Children's individual learning styles

Structurally, the needs of children with similar talents, abilities and learning styles are met through streaming. Streaming at the end of Primary Four, for example, at the age of 10 years, aims to place a child in a stream in which the content, learning pace and approach are most suited to him/her, so that he/she can complete primary education successfully (at the end of Primary Six, aged 12 years). In the classroom, teachers seek a balance in teaching to individual learning styles, using a variety of teaching methodologies and learning activities. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

What is the impact of ICT in teaching practice? (eg use of electronic whiteboards, intranets, managed learning environments/local grids)

There is prevalent use of ICT in teaching and learning. Teachers integrate the use of available software packages, the Internet/Intranet and electronic devices (such as digital cameras) into their instruction, to make teaching and learning more current, relevant and interesting. Teachers' use of e-mail facilities to communicate with their students outside the classroom is also common. Some schools have also subscribed to e-learning services provided by external vendors, to enhance the resources that teachers can use in instruction and that children can use for independent learning. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

The 'IT Masterplan' has created an IT-enriched learning environment in schools and helped to nurture a teaching force that is able and keen to explore the opportunities that technology offers. Evaluations conducted by the Ministry of Education (MOE) have shown that a significant percentage of teachers express interest in further training in the use of IT to enhance the teaching process; find preparing IT-based lessons worthwhile; and want to explore more ways to integrate IT into their teaching. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

Evaluations have also shown that children find that the use of IT has made lessons more interesting, improved their knowledge, improved their learning, encouraged them to learn beyond the curriculum and allowed them greater interaction. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

8. Resourcing

How far are resources to support teaching made available via government/central/local agencies?

How far, and in which subjects, are resources statutory/ recommended/ subsidised? (eg textbooks, courses, lesson plans for teachers, web-based materials)

Textbooks

All textbooks are approved by the Ministry of Education - for a five-year period - and included in the *Approved Textbook List* (*ATL*), from which teachers select specific textbooks for use in class.

Textbooks are either produced by the Ministry or by private publishers and commercial companies, but all have to be reviewed and approved.

The conditions for approval generally include such categories as:

- textbooks should adhere to the requirements of the appropriate syllabus;
- they should be clear and logical in their presentation; and
- they should include activities to enhance the learning experiences of children.

Parents normally buy textbooks. In instances of need, families can apply for free textbooks or other financial aid from the school.

Approved textbooks do not 'stand alone'. They are usually produced as part of a multimedia package, which takes account of approved subject syllabuses. Consequently, for each subject, for a specific year group, the package generally consists of the student's textbook, an activity workbook, a teacher's guide and/or resource book and a range of audio-visual materials such as wall charts, picture cards, audio and video tapes and colour transparencies.

Electronic materials

As part of the *Singapore One* programme, launched in early 1998 to provide a single electronic network to serve everyone in Singapore, every child has been given access to the national multimedia network, including access to the Internet, a range of information sources and local television and video programmes.

Support for Curricular Change

Curricular change is supported by the provision of teaching and learning resources, which are coordinated and funded by the Ministry of Education (MOE). (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

In the case of National Education (NE), a compendium of resources was provided and a website was set up to house information about various events and programmes and as a repository of good ideas for teachers to draw on. NE seminars are organised for

personnel responsible for developing and leading the implementation of NE programmes. In addition, monthly videos covering a wide range of topics are produced to keep teachers up-to-date, not only with education initiatives, but also with regional and international happenings. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

For the 'IT Masterplan', the MOE funded the provision of computers, the networking of schools, physical renovations, software and courseware, and teacher training. All teachers have been trained to handle IT-based instruction in the IT-enriched classroom and to support new learning strategies among their students. (Mdm Sharon Boey, Head of Humanities and Aesthetics, Curriculum Planning and Development Division, Ministry of Education.)

Resource package for sex education

In late 2001, the Ministry of Education launched a multimedia resource package (entitled *Curious Minds*) to enhance the teaching of sex education at upper primary level (children aged 11 to 12 years). Including a video and CD-ROM, the resources have been developed following the October 2000 introduction of the *Framework for Sexuality Education* for schools in Singapore. Further information is available from the Ministry of Education, Education Programmes Division, Psychological and Guidance Services at http://www1.moe.edu.sg/pgsb/sexualit1.htm.