

Sabbatical Report.
Peter Fitzgerald

Visits to schools in Singapore in April May 2010 and again in January 2011.

Term 2 2009.

Objective of the trip was to look at the teaching of Maths in Singapore schools. This interest arose when I was completing an action research project on the teaching of Maths 5 years ago.

Singapore consistently tops the international tables in Maths achievement.

However during the visits to schools, other aspects of their education system aroused my interest.

- ICT
- Special Needs
- Teacher Training and development.

Schools are large and multi storied. Surrounded by high rise buildings.



Schools range in size from just under 1000 to over 2000 pupils.



Rooms are large, ratios 1:30 in juniors and 1:40 in other rooms.





**Schools are organized into clusters.
PURPOSE OF the CLUSTER SYSTEM**

- Allows MOE to devolve greater autonomy to schools
- Enables schools to exercise flexibility and be more responsive
- Provides platforms for collaboration, sharing and learning.

BENEFITS OF CLUSTER SYSTEM

- Provides leadership opportunities for teachers and students
- Provides enrichment opportunities for students within the cluster
- Multiplies school resources – shared resources and targeted additional provisions by cluster
- Acts as a platform to pilot innovative ideas.
- Promotes better understanding of MOE policies
- Increase collaboration among schools
- Promotes professional exchange among schools
- Allows for mentorship of Ps and VPs
- Allows for speedier appointment of middle managers.



ICT

- The level of ICT resourcing in Singapore is outstanding.
- The Singapore target is to include ICT in 30% of all lessons.
- Singapore schools have high expectations of use of ICT in the home, like NZ approx 80% of homes have internet computer capability.
- ICT is used as a teaching tool mainly by using PowerPoint to present lesson content.
- ICT skills were not taught as a discrete subject but always as always part of another subject
- Children were very adept at typing, which enabled them to utilise the keyboard with a certain amount of proficiency.
- Much of the software used is common to the UK. E.g. BBC Typing Tutor
- There was much creative use of ICT with a greater emphasis on presentational and multi-media possibilities (eg 'claymation')
- There was a progressive development of staff capability through their extensive PD programme.

An example of what is happening in ICT - FUHUA Primary School

Focus Area: Knowledge Creation in ICT

The school is exploring the use of ICT to support inquiry along a continuum from structured inquiry to guided inquiry to student initiated inquiry in the teaching and learning of Science. This is based on the Inquiry-Based Learning pedagogical framework.

The school focuses on the use of an inquiry-based approach for the teaching and learning of Science in the Primary 3-6 levels. Teachers are encouraged to help students to progress along a 3-point inquiry (structured inquiry, guided inquiry and self-initiated inquiry)

ICT is used for the purpose of information source, data-gathering, analysis and presentation & communication.

The school has a structured programme for imparting ICT skills to students which is weaved into the syllabus with group-work. Over and above these ICT skills sets, the students learn specialized skill-sets as follows:

- animation using Kahootz
- Newscasting with NewsMaker
- Comiclfe on Mac platforms
- Video-Editing
- Podcasting
- Mind-mapping with Inspiration7
- Vox Proxy cartoon animations in PowerPoints
- Clay Animation



P1	-Typing Skills -Computer Basics -Publishing Skills: Use of any word processing tool: MS Word / Creative Writer 2 -Basic Animation – Kahootz
P2	-Reinforcement of typing skills/computer basics (including peripherals and items not seen) -Internet Surfing, Use of Search Engines and e-mailing -Scanning of pictures -Publishing Skills: MS Word -Basic Animation – Kahootz
P3	-Internet Surfing and use of Search Engines -Digital Art: Use of Art Attack/Paint -Use of digital camera -Use of PDA in the curriculum - MsWord -Presentation Skills: MS PowerPoint -NewsMaker (for newscasting)
P4	-Basic Movie-making –iMovies - Comic Life -Use of PDA in the curriculum -MsWord -Presentation Skills: MS PowerPoint
P5	-Video-Editing – Windows Movie Maker - Podcasting -Inspiration7 for Mind-mapping -Geometer Sketchpad for Investigative Maths -Use of PDA in the curriculum -MsWord -Presentation Skills: MS PowerPoint -Clay Animation (iMovies)
P6	-Vox Proxy for Animations in PowerPoint -Geometer Sketchpad for Investigative Maths -Use of PDA in the curriculum -MsWord -Presentation Skills: MS PowerPoint -MS Excel

Extracts from the Ministry of Education ICT development Plan.

a. Curriculum and Assessment

ICT was integrated into 30% of the curriculum time at all levels and into all subjects, where appropriate, as the use of ICT was seen as an essential tool in bringing about shifts in learning from mainly knowledge dissemination to more active engagement of students.

b. Physical and Technological Infrastructure

All primary schools were provided with an initial student-computer ratio of 6.6:1 while secondary schools and Junior Colleges had an initial student-computer ratio of 5:1. Schools were given computer laboratories, with 3 in each Primary School, 4 in each Secondary School and 5 in each Junior College.

MOE also provided school-wide networking in every school to allow internet and digitized media resources to be accessed in all classrooms and learning areas, as well as the sharing of teaching and learning resources within and between schools by teachers and students. Each school was also provided with a Technology Assistant to give first-level onsite support in resolving hardware and software problems and in maintenance work.

c. Content and Learning Resources

MOE acquired a starter set of suitable commercially available educational software for schools, and set up a central clearinghouse to source, evaluate and recommend suitable ICT-based learning resources, such as CD-based software titles and internet sites to schools, via the MOE learning website, edu.MALL. The Educational Software Procurement Scheme (ESPS) was also implemented to help schools obtain software easily and at discounted prices. MOE also developed digital resources for subjects that were not commercially available, e.g. Mother Tongue languages, as well as gave schools an annual software budget with the autonomy to decide which software to purchase. MOE collaborated with local industries to encourage the development of a wide range of educational software that met the specific needs of the local curriculum.

d. Human Resources Development

In mp1, every teacher received between 30 and 50 hours of school based training on the integration of ICT into the curriculum conducted by Senior ICT Instructors from the Educational Technology Division, set up within MOE. MOE also organized ICT-based sharing sessions, conferences/seminars to encourage regular exchange of ideas and professional reflections among teachers and key school personnel.

e. Research and Development

Two major projects included the development of the eduPAD and the Digital Media Repository (DMR). The eduPAD was a prototype equivalent to the current Tablet PCs available in the market, and the DMR was a centralized repository of digital resources accessible via the networks by teachers anytime anywhere.

Teacher Training.

Teacher Training is strictly controlled and delivered by one institution – NIE
Applicants are not always accepted.

Before College, applicants are sent to a school where they must work for 12 months. Initially they work as teacher aides and gradually increase their classroom involvement, taking groups, reading to the class etc.

At 6 and 12 months, they have to be assessed for suitability. They must pass these milestones.

The school that passes them as suitable for entry to College, is the school that has them as beginning teachers when they graduate.

If they pass the 12 month in school practice they then go to College.

College focuses on the practical. While they may specialise, i.e. PE, all teachers must be competent and able to deliver programmes in Maths, Science, English and a language.



MATHS

Maths is seen as vitally important.

Maths takes place every day, no exceptions.

Regular testing takes place 4 times a year.

The curriculum is clear and precise in guiding teachers what to teach.

In 1999 content was reduced by 30%. Teach less, teach more.

Resources are provided; power point, games, activities, text books etc.

Close and reading activities takes place as part of Maths.

Maths Vocabulary is taught.

Children follow three stages; concrete, pictorial, abstract.

Banding on ability takes place - varies as per school policy.

School closes early one afternoon each week. Staff meetings and PD takes place sharing;

Content. – Teachers actually complete the work.

Good teaching practice.

Common errors

Areas of concern.

Pull out programmes take place for low

ability when maths takes place 1:10

As well extra Maths help happens after school.

Children are identified like we do for

reading recovery for maths recovery.

There is a heightened awareness of the end Goal.

P 1 teachers know what is required at P2.

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P 2 teachers know what is required at P3

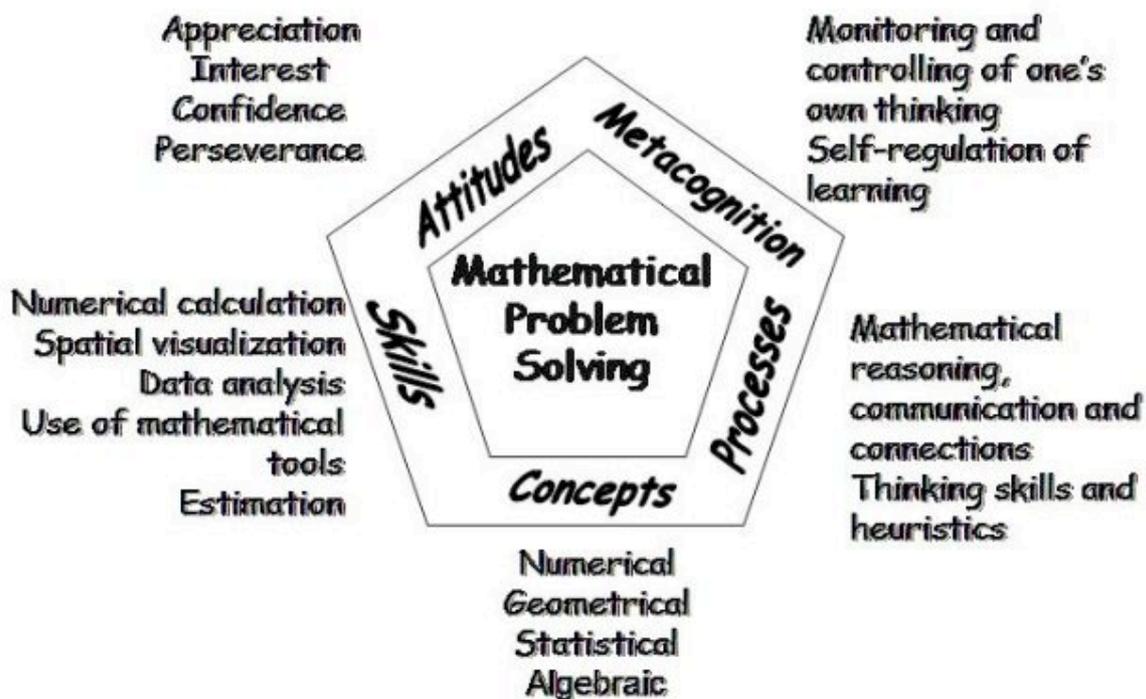
etc.



SINGAPORE MATHEMATICS CURRICULUM

- 1981 first Primary Math curriculum was developed
- focused on content
- 1992 curriculum was revamped
- key emphasis on problem solving
- 1994 curriculum was revised
- 1999 - content reduction by up to 30% to provide room for implementation of key initiatives (thinking skills, use of IT and delivery of National Education messages)
- 2001 - problem solving continued to be the central emphasis
- 2007 - emphasis on reasoning, communication and connections in addition to problem-solving skills

Maths Curriculum Framework

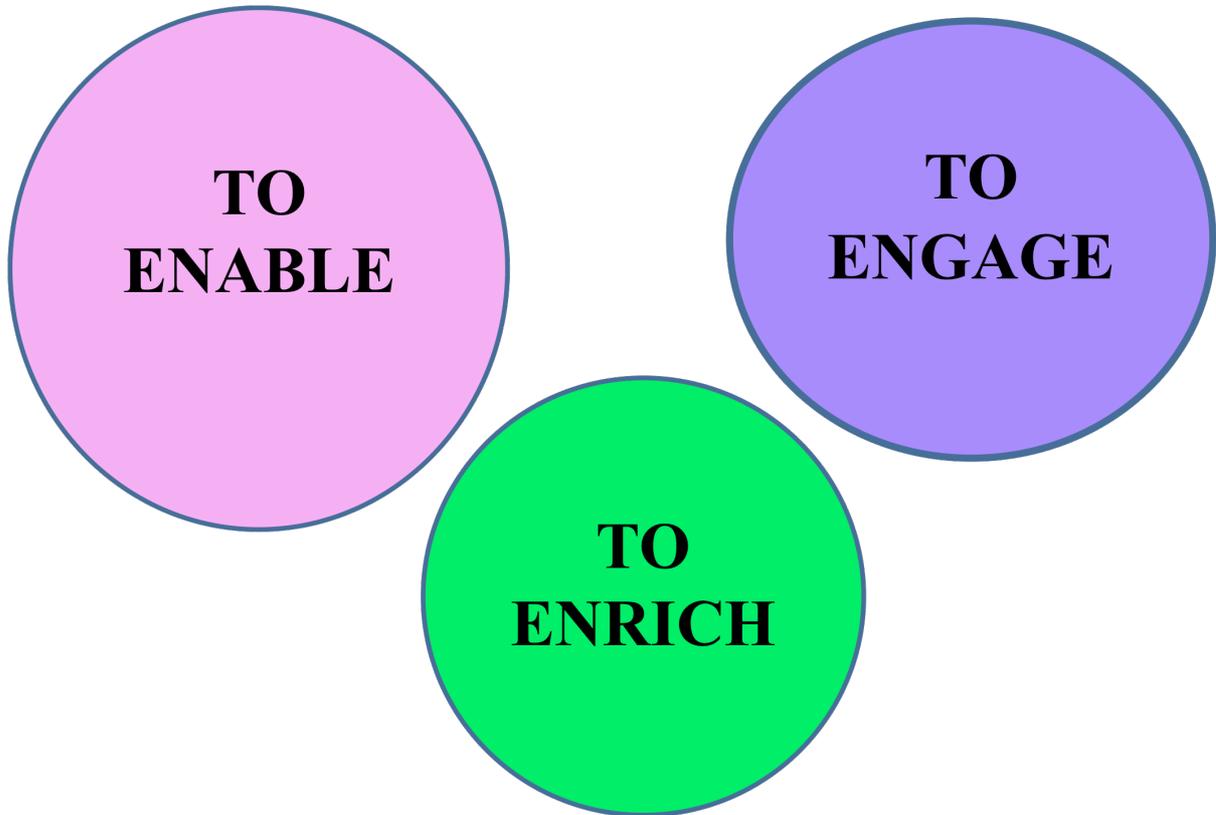


MATH INSTRUCTIONAL PROGRAMME

- mastery of knowledge and skills
- problem solving
- critical and creative thinking skills
- communication skills

- Emphasis on the development of understanding of concepts rather than rote learning
 - provision of learning experiences beginning with concrete and pictorial stages , followed by abstract stage to enable pupils to learn Math meaningfully
- Emphasis on proficiency in problem-solving processes
 - heuristics are taught to increase the probability of solving a problem

- Model Method to develop students' understanding of fundamental Math concepts and proficiency in solving basic mathematical word problems, providing a strong foundation for the learning of Math



TO ENABLE:

Banding based on ability
"Extended" curriculum time
Learning Support Math for P1 pupils
Pull out programme for lower ability pupils

TO ENGAGE

Math Reasoning and communication
Hands on Mathematics
Integration of IT

TO ENRICH:

Training In Math Olympiad Competition
Internal Math competition

Special needs.

There is a very effective identification system in place.

Each cluster has a resource school for each main gift.
These schools have extra specially trained staff for these children.
High need cases go to other special schools.
Special Ed is staffed with various experts.



General Observations

Visualisers: May be more useful to some teachers than interactive white boards in the first instance. They are instantly usable.

The large numbers in class – 44 in middle/upper primary & 30 in junior rooms.

There are some similarities between Awakeri and Shuqun – parents, children etc
It is mainly whole class teaching and they seem to teach to one level regardless of abilities.

P1 and P2 (6, 7, 8 year olds) spend most of their day teaching Literacy and Numeracy without all the other topics thrown in (they still have Arts, and Mother Tongue).

The amount of pressure and stress put on the children to pass the exam. They learn because there are consequences for them if they don't pass.

Specialist teachers available on site (E.g. Dyslexia)

Class teachers do not make the Maths post tests.

Whole class learning can work

Impressed with the use of technology in classrooms as part of everyday lessons.

There is a lot of pressure to score highly on the P6 test.

They have found E portfolios are difficult, tedious

Pressure from exams gives students an incentive for learning

Model drawing a good approach to solving maths word problems

Teacher school expectations very high, behaviour, community service, academic.

They teach Maths with emphasis on pictorial approach and problem solving. Little use of concrete materials.

Repetition was a factor in all lessons.

Maths was pretty similar for P1 and our year 1 & 2, however from then on it appeared more advanced. i.e. basic facts known at P3 (year 4) while in NZ it is Year 6.

Textbooks for everything ensures consistency of learning

Equal emphasis on all aspects of Maths, not just numeracy.

Only Literacy, Mathematics, P.E., Music and Art are taught at P1 & P2.

Visualisers & Data Projectors appeared to be widely used. Visualisers in classrooms that enabled teachers to enlarge objects/pieces of writing/books etc

Teacher training sessions every Thursday to improve PD in all curriculum areas

Some excellent resources for special needs - 2 different types of pencil grips and plastic letters that show where to start and the correction to form letters and Stila.

Joy Cowley is one of the authors they use for big books. Mostly big books and poems used in junior rooms. Very few individual readers. Found PM Readers in a book shop in Brunei!

Reading is taught in themes.



Ideas to pursue.

Purchase pencil grips as per the type we saw.

Purchase individual white boards.

Looking at cost of electronic notice boards

New software for editing film from new movie camera.

Use their Check lists for special needs.

Regular parent education evenings

Teacher training sessions 3 times a Term.

Remedial Maths programme at 5 years.

Extra help, not to be confused with Teacher Aide

classroom support, to happen before school when possible. i.e. RTLB, ESOL

Visualisers in rooms

Introduction of model problem solving technique.

Look at their program for staged learning of computer skills to see how it matches up with ours.

Introduce Maths Olympiad activities to extend thinking.

While keeping a balance put an emphasis on testing to make children accountable.

Using the school environment better to reinforce skills /attitudes (I loved their banner which said " have you asked a question today')

Use SMART Targets in IEPs and goal setting – Specific, Measurable, Achievable, Realistic, Timely.

Teach vertical form with place value from year 2. Teach only one way to whole class, extension will cover various ways to solve mechanical processes.

More emphasis on maths problem solving, especially in Year 2 upwards.

Pushing for higher standards in junior maths.

Temporary Stationery shop for the first two weeks of school. Remove stationery from teachers.

Mini laptops used for EOTC trips

Formalise maths testing, E-asttle. Pre and post testing.

Data loggers used on EOTC trips

