

Celebrating Mathematics

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Give me a connection between
Singapore and mathematics

Connection: Top 3 answers

- The president and PM of Singapore are mathematicians

Connection: Top 3 answers

- The president and PM of Singapore are mathematicians
- Singapore Math is a brand name

Connection: Top 3 answers

- The president and PM of Singapore are mathematicians
- Singapore Math is a brand name
- The pentagon is 25 years old

Celebrating: vertically in time and horizontally in scope

- Textbook
- Syllabus
- Mathematics
- Classroom

TEXTBOOK

Life before 1984

- No numbers on page one of P1 textbook
- Textbooks available in Chinese for the region
- Textbook is syllabus
- English schools were better provided with
(class size / teachers training)
- Full localization after Math Reforms

CDIS textbook

- Produced by MOE in the 80s
(introducing model method)
- Used in schools for over 20 years
- Still used in NIE for teaching
- There is a US edition

On process and in context

- Early attempts: linear programming, tessellation
- Lately through mathematical modelling
- Problems developed by teachers
- Taught within curriculum time
- Beyond textbooks

Publishing

- Writing textbook is a mad rush
- Publishers sell more e-books than hard copies
- ICT changes our learning habit
- What is the role of textbook?

SYLLABUS

First local syllabus 1959

- Syllabus for Grade 1 to Grade 13 in one book
- Syllabus printed in English and in Chinese
- Content is descriptive, approach is spiral
- Next change in 1968 (revised 1973) for the secondary, in 1971 (revised 1976) for the primary

Curriculum Planning Committee 1969

- My first involvement in math syllabus
- During the time of Math Reforms and adopting Syllabus C (1974- 1977)
- Full localization of syllabus, textbooks, and teacher training

New Education System 1979

- Streaming began
- Science and math taught and examined in English (1976 – 1984)
- Back to basics (Syllabus D)
- Some topics moved from sec 1 to sec 4

The pentagon 1989

- The pentagon was born
- Problem solving is core
- The pentagon stays and grows
- What is the role of the fat pentagon?

MATHEMATICS

Calculus Reforms

- An attempt to replace calculus by finite math in the 70s
- Ten years of calculus reforms in the 80s
- Calculus is to be taught graphically, numerically and analytically
- 1000 pages textbook stays on

Growth of university mathematics

- Analysis, algebra and geometry in the 50s
- Statistics added in the 60s
- Numerical analysis and operations research added in the 70s ...
- Analysis, algebra, discrete mathematics (coding), and statistics in the past 4 decades

Mathematics for students

- Mathematics in other disciplines
- No more applied mathematics
- Less and less pure mathematics (analysis)
- Do we teach enough computation and rigour?

Mathematics for teachers

- Teachers may need mathematics of a different kind
- Teachers may need mathematics to be taught in a different way
- We failed to produce a (blue) book for the purpose

CLASSROOM

Teaching approach

- New teaching approach is a belief
- Talk more about sense of mathematics, less on mathematics
- More passive learning using ICT
- Learn in small pieces
- There is no one best way

Assessment landscape

- Down play PSLE
- IB (International Baccalaureate) in place of O level exam
- Take part in TIMSS and PISA
- Encourage use of performance tasks
- The landscape is changing

Essence of teaching

- My visit to Jindaoxia (金刀峡) Primary school (a village school in China)
- Knowledge before creativity
- Teaching approach making high demand on teachers is not scalable
- Apply multiple tactics in teaching

Teacher training

- To deliver a good lesson comes first
- Aiming for a majority getting credit
- No second chance in the past, now almost no exit policy for student teachers

Reflections

- Nowhere to copy
- Seen it before
- Asia provides a rich ground for educational research

Memory

- 50 years of teaching and over 20 years in Yunnan Garden
- Regional Centre for Mathematics at Nanyang University 1979
- EARCOME 6, a journey of 35 years

END

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in great world city