

Trends in International Mathematics and Science Study (TIMSS) 2011

Summary of Findings

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Background

TIMSS is the largest international study of mathematics and science education in the history of comparative studies. It is conducted under the auspices of the International Association for the Evaluation of Educational Achievement (IEA). TIMSS consists of an international test of student achievement in mathematics and sciences, and it probes into different factors that account for student achievement through a set of questionnaires. Over 588,000 Primary 4 and Secondary 2 students from more than 60 countries/regions participated in TIMSS 2011.

The Hong Kong component of TIMSS is conducted by the Faculty of Education, HKU. In Hong Kong, 3,957 Primary 4 students from 136 primary schools and 4,015 Secondary 2 students from 117 secondary schools participated in the study. Schools and classes were randomly selected. Schools, mathematics teachers and science teachers of the sampled students were asked to complete a school questionnaire and a teacher questionnaire. Students were required to complete a test booklet and a student questionnaire.

Areas tested at Primary 4 are:

Mathematics: 1. Number 2. Geometric Shapes and Measures 3. Data Display

Science: 1. Life Science 2. Physical Science 3. Earth Science

Areas tested at Secondary 2 are:

Mathematics: 1. Number 2. Algebra 3. Geometry 4. Data and Chance

Science: 1. Biology 2. Chemistry 3. Physics 4. Earth Science

Hong Kong Results of TIMSS 2011

Mathematics Achievement

Primary 4

- TIMSS scale score: 602
- International ranking: 3rd
- Significant improvement over the performance in 1995 and 2003 but no significant difference from the performance in 2007
- Percentage of students reaching the “Advanced” International Benchmark: 37%
→ A significant increase of 15% and 20% over the performance in 2003 and 1995, respectively
- Gender difference in achievement: boys > girls

Secondary 2

- TIMSS scale score: 586
- International ranking: 4th
- Significant improvement over the performance in 1995 but no significant difference from the performance in 1999, 2003 and 2007

- Percentage of students reaching the “Advanced” International Benchmark: 34%
→ A significant increase of 6% and 11% over the performance in 1999 and 1995, respectively
- Gender difference in achievement: No significant difference

Science Achievement

Primary 4

- TIMSS scale score: 535
- International ranking: 9th
- Significant improvement over the performance in 1995 but a significant decrease in performance compared to the performance in 2007
- Percentage of students reaching the “Advanced” International Benchmark: 9%
→ A significant increase of 4% over the performance in 1995 but a significant decrease in performance compared to the performance in 2007
- Gender difference in achievement: boys > girls

Secondary 2

- TIMSS scale score: 535
- International ranking: 8th
- Significant improvement over the performance in 1995 but a significant decrease in performance compared to the performance in 2003
- Percentage of students reaching the “Advanced” International Benchmark: 9%
→ No significant difference from the performance in 1995, 1999 and 2007 but a significant decrease in the performance compared to the performance in 2003
- Gender difference in achievement: No significant difference

Background and Attitudes

- The GNP per capita for Hong Kong increased from US\$ 29,040 in 2007 to US\$31,570 in 2011
- Public expenditure on education: 5% of Gross Domestic Product (GDP)
- Average age of Primary 4 students tested: 10.1 years old
- Average age of Secondary 2 students tested: 14.2 years old
- Home with more resources for learning is associated with higher mathematics and science achievement
- Hong Kong students’ values of mathematics and science and their confidence in learning the two subjects are rather low. There are more Primary 4 students with positive attitudes towards mathematics and science than students at Secondary 2, however, the percentages of students having positive attitudes towards mathematics and science are all lower than the international averages at both grades.