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## **Press Release**

### **Trends in International Mathematics and Science Study (TIMSS) 2019**

**Project Leader & Chairman of Hong Kong Centre for IEA<sup>1</sup> Studies: Professor Frederick Leung**  
**Project Co-leader: Dr Maurice Cheng**  
**Project Manager: Mr Yip Hak-Kwong**

#### **(I) TWENTY FOUR YEARS OF EDUCATIONAL TRENDS IN MATHEMATICS AND SCIENCE ACHIEVEMENT: HONG KONG STUDENTS' PERFORMANCE IN TIMSS 2019**

In the Trends in International Mathematics and Science Study (TIMSS) 2019 press conference scheduled today (December 8, 2020) at Room 408 - 410, Meng Wah Complex, HKU, the project leader informed the public about Hong Kong Primary 4 and Secondary 2 students' performance in mathematics and science as compared with more than 60 other countries/regions.

More than 580 000 students worldwide participated in TIMSS 2019, which is the seventh cycle of this international study. 2 968 Primary 4 students and 3 265 Secondary 2 students from 139 primary and 136 secondary schools in Hong Kong respectively participated in the assessment.

The Chairman of Hong Kong Centre for IEA Studies, Professor Frederick Leung, announced the findings of the Hong Kong component of TIMSS 2019 at the press conference concurrently with the official international press release in Paris, France on 8 December 2020. Professor Leung said, "This is the seventh time Hong Kong participated in TIMSS since it was conducted in 1995. Participation in TIMSS provides us with invaluable and reliable trend data to make evidence-based decisions on how to improve teaching and learning in mathematics and science, and also monitor Hong Kong students' achievement trends in an international context. TIMSS not only informs us about the prevailing standings of different countries' mathematics and science achievement, but also describes the changes in achievement over time."

Professor Leung pointed out that computer-based assessment (eTIMSS) was adopted in TIMSS 2019, which was different from the mode of paper-based assessment adopted in previous cycles. To associate the scores of eTIMSS with paper TIMSS in past cycles, a Bridge Study was conducted. For Hong Kong, 1 329 Primary 4 students and 1 423 Secondary 2 students participated in the Bridge Study, and it was found that there was an impact on students' performance due to the change of paper-based assessment to computer-based assessment. Hong Kong students were more seriously affected by the change than other countries/regions participating in the study.

In TIMSS 2019, Hong Kong students continue to demonstrate remarkable performance in mathematics. Hong Kong students occupied the 2<sup>nd</sup> position in Primary 4 mathematics. Hong Kong, Singapore, Korea, Chinese Taipei and Japan occupied the top five international positions. Similar to the results found in previous cycles of TIMSS, students from these five East Asian countries/regions outperformed their counterparts in other participating countries/regions. Among them, the results of Hong Kong, Korea and Chinese Taipei did not show significant difference. Hong Kong students also performed very well in Secondary 2 and occupied the 5<sup>th</sup> position. The other top-performing countries/regions were Singapore, Chinese Taipei, Korea and Japan.

In Primary 4 science, Singapore, Korea and Russia occupied the top three international positions. Comparatively, Hong Kong students performed less well and occupied the 15<sup>th</sup> position. The science performance of Hong Kong students was not significantly different from the performance of their counterparts in the United States of America,

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<sup>1</sup> IEA = International Association for the Evaluation of Educational Achievement

which occupied the 9<sup>th</sup> position. At Secondary 2, the science achievement of students in Singapore, Chinese Taipei and Japan which occupied the top three positions was significantly higher than that of Hong Kong students. While Hong Kong occupied the 17<sup>th</sup> position, the result was not significantly different from the results of England, which occupied the 14<sup>th</sup> position.

## **(II) OTHER KEY FINDINGS:**

### ***1. Trends in Achievement***

In the past six cycles of TIMSS, the mathematics achievement in Hong Kong shows an upward trend for Primary 4 and a fairly consistent pattern for Secondary 2. In 2019, the Primary 4 students' achievement was significantly lower than that of 2015, but almost the same as that of 2011 and 2007, and significantly higher than that of 2003 and 1995. The Secondary 2 students' achievement in TIMSS 2019 mathematics was significantly lower than that of 2015, but was not significantly different from those of the previous cycles.

For science, the TIMSS 2019 achievement of Primary 4 students was significantly lower than the results of TIMSS 2015, 2007 and 2003, but not significantly different from that of 2011 and significantly higher than that of 1995. The Secondary 2 students' achievement in TIMSS 2019 science was significantly lower than those of TIMSS 2015, 2011, 2007, 2003 and 1999. There was a more noticeable variation in Hong Kong students' performance in science than in mathematics.

### ***2. International Benchmarks***

Students' performances in TIMSS are classified into 4 levels of international benchmarks. In Hong Kong, over one-third (38 percent) of the Primary 4 students reached the "advanced" international benchmark (score reaching 625) of mathematics, lower than the 45 percent in 2015. At Secondary 2, nearly one-third (32 percent) of Hong Kong students reached the "advanced" international benchmark of mathematics (lower than the 37 percent in 2015). For science, there were 8 percent of Primary 4 students reaching the "advanced" international benchmark of science (lower than the 16 percent in 2015). At Secondary 2, there were 9 percent of students reaching the "advanced" international benchmark of science (lower than the 12 percent in 2015).

In Hong Kong, all Primary 4 students (after rounding) attained the lowest international benchmark of mathematics (score reaching 400), same as 2015; and 96 percent Secondary 2 students passed the lowest international benchmark of mathematics (slightly lower than the 98 percent in 2015). For science, 96 percent of our Primary 4 students passed the lowest benchmark (slightly lower than the 98 percent in 2015), and the percentage of Secondary 2 students who passed the lowest benchmark of science decreased from 96 percent in 2015 to 85 percent in 2019.

### ***3. Gender and Achievement***

In TIMSS 2019, there was no significant difference in both mathematics and science achievements between boys and girls at Primary 4 and Secondary 2.

### ***4. Attitudinal Results***

It should be noted that Hong Kong students were less likely to have positive attitudes towards mathematics and science when compared to students from other parts of the world, especially in their confidence in the two subjects. In Hong Kong (and other countries/regions as well), Primary 4 students generally had more positive attitudes towards mathematics and science than Secondary 2 students. They were more likely to find mathematics and science interesting and had more confidence in learning the two subjects than Secondary 2 students.

**[A summary of findings is attached to this press release]**

## TIMSS 2019 Participants

The Trends in International Mathematics and Science Study (TIMSS) 2019 was conducted under the auspices of the IEA. The participating countries/regions include Albania, Australia, Armenia, Austria, Azerbaijan, Bahrain, Belgium (Flemish), Bosnia and Herzegovina, Bulgaria, Canada, Chile, Chinese Taipei, Croatia, Cyprus, Czech Republic, Denmark, Egypt, England, Finland, France, Georgia, Germany, (Hong Kong, China), Hungary, Iran, Ireland, Israel, Italy, Japan, Jordan, Kazakhstan, Korea, Kosovo, Kuwait, Latvia, Lebanon, Lithuania, North Macedonia, Malaysia, Malta, Montenegro, Morocco, Netherlands, New Zealand, Northern Ireland, Norway, Oman, Pakistan, Philippines, Poland, Portugal, Qatar, Romania, Russia, Saudi Arabia, Serbia, Singapore, Slovak Republic, South Africa, Spain, Sweden, Turkey, United Arab Emirates, United States of America (plus 8 benchmarking participants from Canada, Russia, Spain, South Africa, United Arab Emirates and some regions of United States of America, including Abu Dhabi, Dubai, Gauteng, Madrid, Moscow, Ontario, Quebec and Western Cape)

### Media Note:

The international reports of TIMSS 2019 can be downloaded at <http://timss.bc.edu>.

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To review the e-version of the press release, and download photos, presentation file and further reference materials, please visit <https://web.edu.hku.hk/media/20201208>.

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