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Twenty years of TIMSS trends show the world is moving in the right direction
Achievement rises, gender gaps narrow, and schools are safer, conclude the IEA

Amsterdam (11/29/2016) – TIMSS 2015, the sixth installment of the IEA’s Trends in International Mathematics and Science Study, reveals that grade 4 and grade 8 students’ mathematics and science achievement has improved, not only over the short term but also over the twenty years since the study began. **The majority of countries participating in TIMSS in 1995 and in TIMSS 2015 have increased students’ achievement in both grades and subjects**, with increases as significant as 99 score points for Portuguese grade 4 students in mathematics and 78 score points for Slovenian grade 4 science students. Trends over the last four years have also seen significant increases in achievement, with improvements of 89 score points for Moroccan grade 4 students in science, 45 score points for Bahrain’s grade eight students in mathematics, and 44 score points for Malaysia’s grade eight students in science. Several countries also registered reduced achievement gaps, indicating educational equity is improving worldwide.

“The world seems to be moving in the right direction,” said IEA Executive Director Dr Dirk Hastedt.

TIMSS is the most comprehensive study of mathematics and science achievement around the world. TIMSS 2015 assessed more than 600,000 grade four, grade eight, and advanced mathematics and physics students in their final year of secondary school. Additional rich background information was collected from the assessed students, their mathematics and science teachers, their school principals, and the parents of grade four students, enabling researchers and policymakers to better understand the factors influencing differences in education and identify which characteristics are most closely related to student achievement. TIMSS was first administered in 1995, and every four years since, providing an unparalleled opportunity to investigate trends in mathematics and science education over 20 years. TIMSS is a flagship study of the IEA, conducted under the auspices of the TIMSS & PIRLS International Study Center at the Lynch School of Education, Boston College, USA.

The TIMSS 2015 results published online today involved 60 countries and benchmarking regions.

The TIMSS Advanced 2015 results, also published today, were less favorable. TIMSS Advanced monitors students in their final year of secondary school who have elected to take advanced courses in STEM subjects. Over the 20 years there were some declines and no improvements in the nine countries assessed. Only Norwegian and Swedish students demonstrated increased achievement in advanced mathematics between 2008 and 2015.

Other highlights include:

- **Mathematics and science are at the heartbeat of education and thriving, and** remain core to school programs, occupying from a quarter to a third of teaching time. This has not changed in the last 20 years.
- **The last 20 years have seen reductions in mathematics class sizes**, but there is no evidence to prove that smaller classes result in improvements in student achievement.

- **Schools are perceived as safer now than they were eight years ago**, with the proportion of students reporting that they attend “very safe and orderly schools” increasing from less than half in 2007 to approximately two-thirds in 2015.
- **Teachers are more qualified in 2015 than they were in 2007**, although qualification standards vary from country to country. However, student achievement does not appear to be related to teacher qualifications.
- **Students regularly using a computer or tablet at home do better** at school than students who don't.
- **Teachers have reduced the frequency of homework given to students**. In 1995, 67% of students said their teachers gave them homework at least three times a week, but, in 2015, this percentage had reduced to 52%. Teachers also expect students to spend less time doing their homework than previously.
- **Mathematics teaching time varies from country to country**. While some countries have increased time spent on mathematics over the last 20 years, others have reduced it. However, the combined time allocated in the curriculum to teaching mathematics and science over the past 20 years appears stable.
- **The gender gap has narrowed and differences favoring boys have reduced**. Historically, boys have generally outperformed girls in mathematics and science. In 1995, boys in most countries (15 of 26) performed better than girls. In 2015, boys performed better in only three of these 15 countries.
- **Students who are confident about their mathematics and science ability, or those who enjoy the subject, score more highly**. While at both grade 4 and grade 8, most students like mathematics, grade 4 students report higher levels of confidence and satisfaction than grade 8 students. Most students report that they usually do well in mathematics, and, in twenty years of TIMSS cycles, less than 17% of students have disagreed with the statement ‘I usually do well in mathematics’.

In light of these findings, Dr Dirk Hastedt concluded, “Twenty years of trends offer three remarkable findings: gender gaps in achievement have narrowed, schools are now perceived to be safer places than in the past, and students consistently report high levels of self-confidence and enjoyment in mathematics. We are happy to convey such positive news.”

By reaching its 20 year milestone, TIMSS earns the distinction of establishing the longest trend line of any international education assessment. TIMSS data enables participating countries to make evidence-based changes in educational policy. Officials have used TIMSS to monitor education systems’ effectiveness in a global context, identify gaps in resources and opportunities, pinpoint areas of weakness, and measure changes in educational outcomes.

The IEA’s comparative studies of education systems across the world enable better understanding of the policies and practices that foster educational progress, and play a critical role in helping nations build their own knowledge and research capacity. By linking research, policy and practice, and measuring how well our education systems are preparing children for the future, our association contributes toward a more educated world.

The IEA thanks everyone who worked so hard on the study at the national research centers of the participating countries, the dedicated teams at our partner institutions – the study center at Boston College,

Statistics Canada, and ETS – as well as all involved at the IEA. Without the steadfast commitment and support of so many people, a study of this magnitude would not be possible!

The results of TIMSS 2015 and TIMSS Advanced 2015 are available at: <http://timss2015.org/>

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