

Examining Gender Differences in the Mathematical Literacy of 15-Year-Olds and the Numeracy Skills of the Age Cohorts as Adults

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Patterns of gender disparities in science, technology, engineering, and mathematics (STEM) fields are seen at various stages, from early education to secondary school through college and into the workforce. These disparities have often been documented in international school assessments and in labor force studies. This study uses data from the two assessments—mathematical literacy in the Program for International Student Assessment (PISA) and numeracy in Program for the International Assessment of Adult Competencies (PIAAC)—to look at the skills and characteristics of a group of 15-year-old students and their age cohort as 23-to-25-year-old adults. **Combining PISA and PIAAC allows one to see the progression of gender differences in mathematics skills from the 15-year-old students in PISA to the cohort of 23-25 years old young adults in PIAAC.**

- In general, there is a fairly close correlation between countries' mathematics performance in PISA 2003 and in numeracy in PIAAC 2012, when looking at the relevant age cohort in PIAAC (23- to 25-year-olds).
- The gender gap in mathematics performance of the cohort of 15-year-olds in PISA 2003 either stayed the same in PIAAC 2012 (when those in the cohort were 23 to 25 years old) or increased. Approximately half of the countries showed an increase in the gender gap, with Finland and United States showing the largest increase.
- Within the total PIAAC population, the size of the gender gap in numeracy increases as age increases. The 16 to 24 age group shows the least number of significant differences between males and females within countries.
- In most countries that participated in PISA 2003, male students were more engaged in and had more positive attitudes toward learning mathematics than females, although most of these gender differences were small.
- In all but one country, more females than males ages 23-25 had completed a university degree. However, many more males than females earned a degree in the STEM-related areas of science, engineering, mathematics, and computing. More females than males choose non-STEM areas and the females who did choose STEM areas more often chose the areas of education sciences or health and welfare.
- Female adults in 10 out of 16 countries in the study used their numeracy skills at home less frequently than males did. Females in 8 of the 16 countries in the sample used their numeracy skills at work less often than males; the Netherlands had the highest gender difference in adults' use of numeracy skill at work.
- In most countries, there was no gender difference in adults' readiness to learn new ideas and information. The United States and Japan were the only two countries in which females showed slightly less readiness to learn new ideas or information than their male counterparts.

These findings suggest that there is still a long way to go toward gender equity in the STEM fields. Educators at various levels need to understand these differences and work with their female students to improve their attitudes and engagement with STEM fields. It is also important for colleges and universities to create resources and policies to encourage female students to choose and complete their major area of study in the STEM fields.