

Mathematics: The Importance of Continued Education via Evidence from PISA and Other Large-Scale Assessments

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Agenda

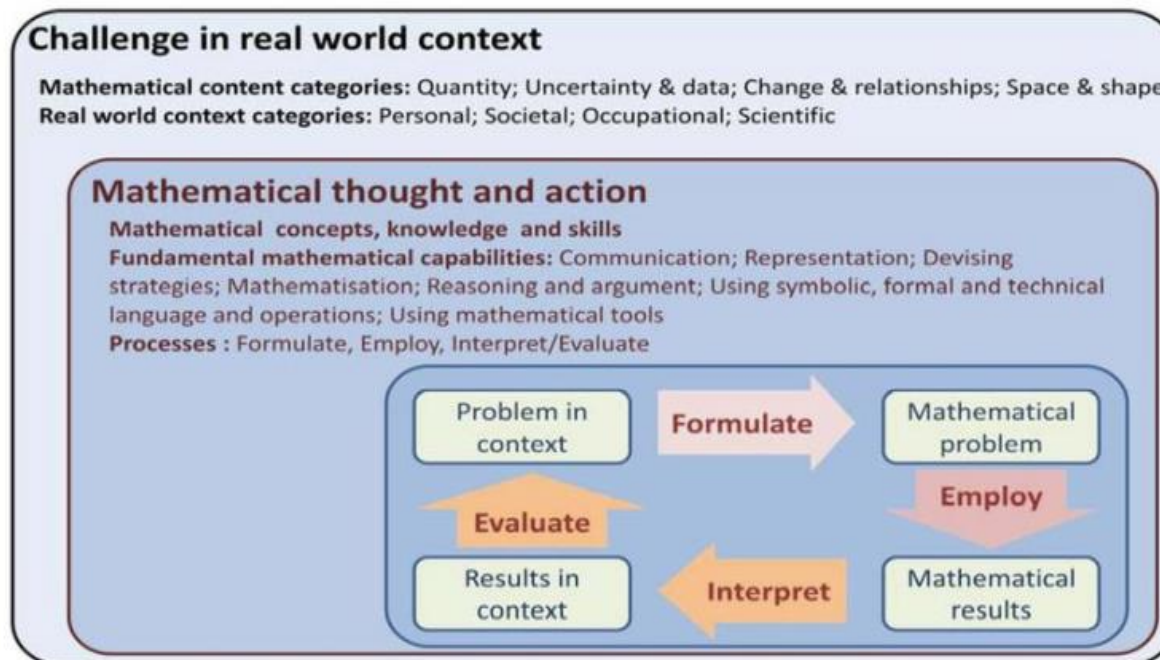
- › Understanding why continued education in mathematics is important for students.
- › How complex mathematics and continued enrollment can influence jobs and wages.
- › Utilisation of PISA and PIAAC to help understand needs surrounding mathematics and work towards more success in this area.



Why is Mathematics Relevant?

Importance of Mathematics

- › Math is not a means to an end; It is a foundational skill to be utilised throughout our personal and professional lives
- › Advanced education and performance in math are becoming more and more important as a result of the technological revolution



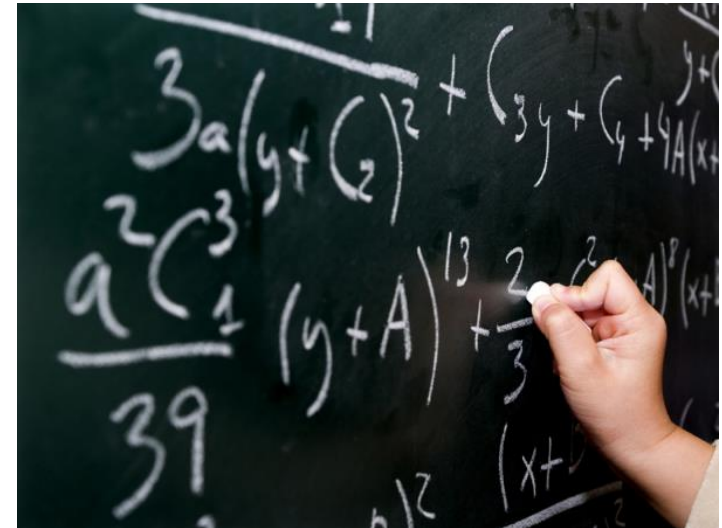
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Why Continued Mathematics?

Learning advanced mathematics is **not** about how to do arithmetic or algebra, it is about learning how to **think abstractly**.

Skills utilised include:

- › Adaptability
- › Communication
- › Problem Solving

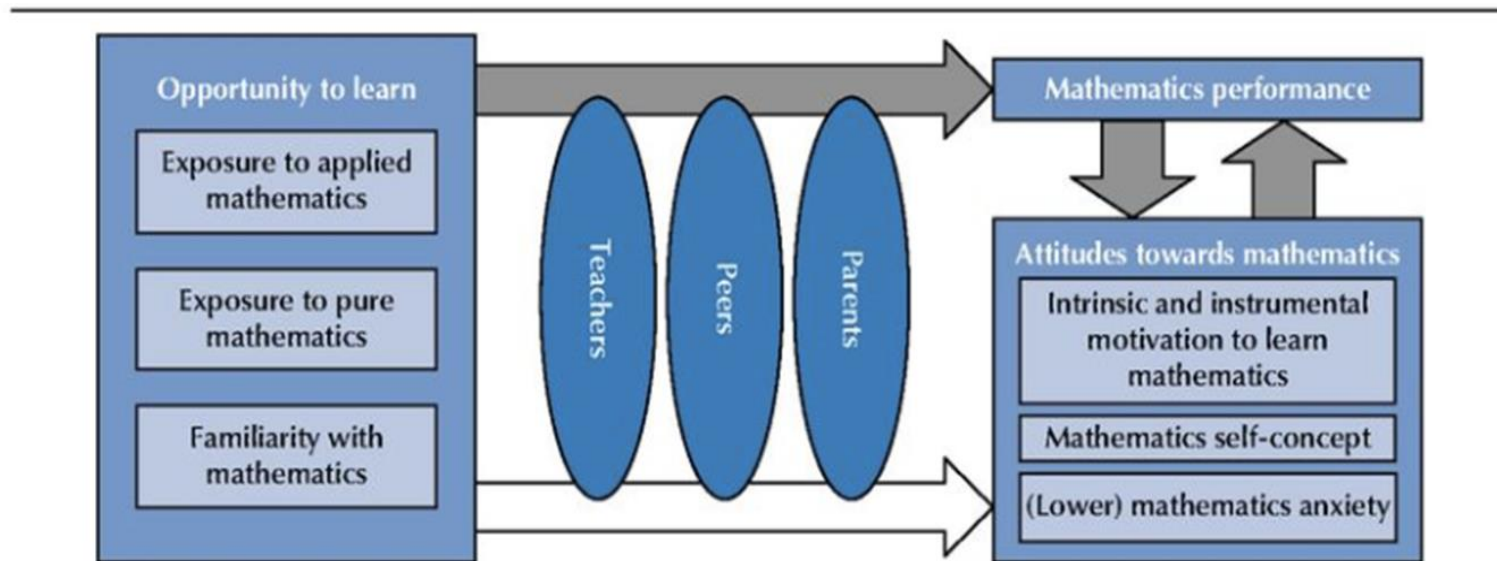


Complex mathematics is not only for the ‘highest achievers’.

- › Those who are good at math are good thinkers, but those who are trained in mathematics **become** good thinkers.

What is the Relationship between Opportunity and Attitudes in Mathematics?

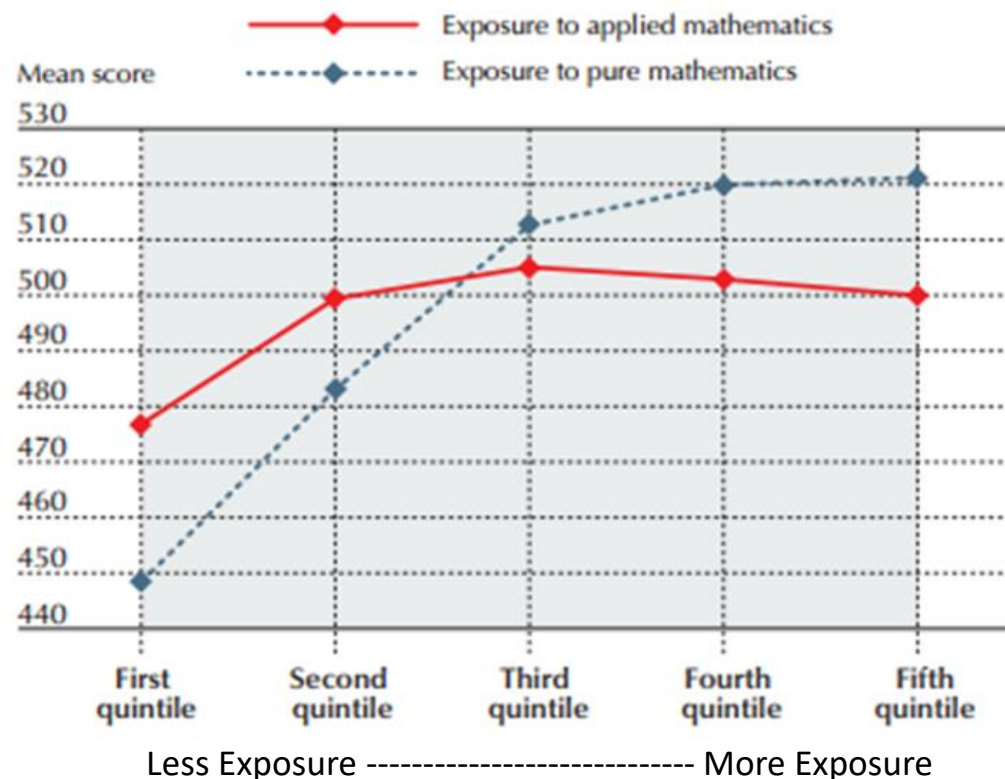
- › Exposure to complex mathematics can help students with low self-confidence and anxiety.
- › Increases motivation for continued enrollment in mathematics.



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What can we do to Promote and Improve Mathematics and Continued Education?

- › Increased exposure to mathematics
- › Address equality in mathematics education
- › Promoting positive attitudes towards mathematics
- › Continued monitoring and analysis of performance



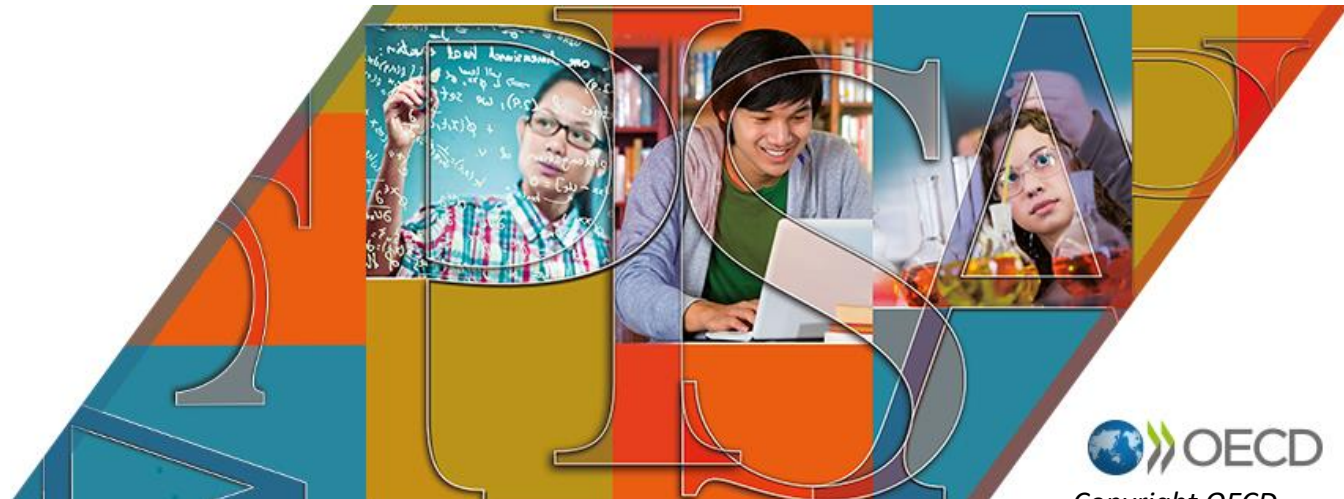
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Conclusion: Exposure to mathematics, regardless of type, increase performance on Mathematics in standardised testing

What is PISA?

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- Programme for International Student Assessment (PISA)
- 500,000 15-year old students worldwide representing over 28 million students
- > 70 countries participating
- Most widely recognised large-scale assessment globally



What can we learn from PISA?

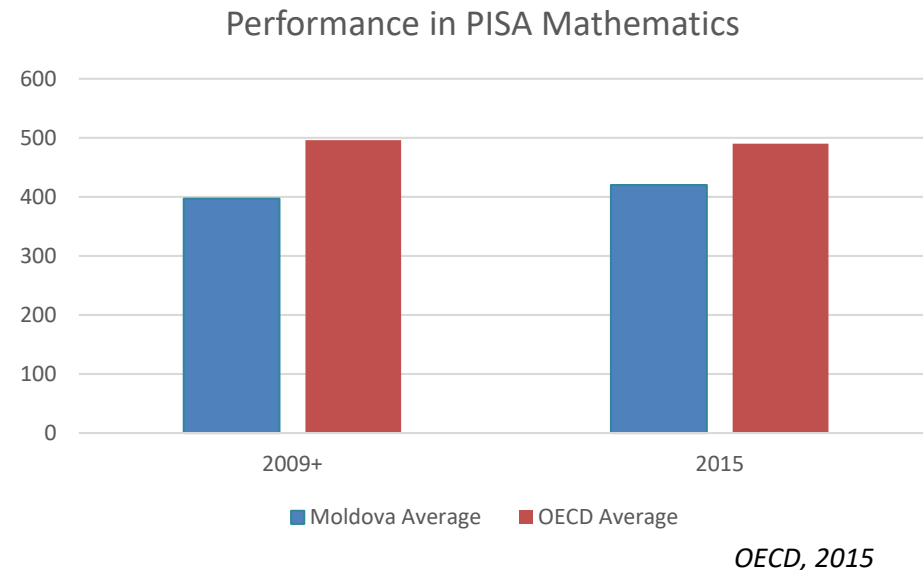
PISA:

Assess capacity to solve real world problems

- › Beyond basic skills
- › Access to new technologies
- › Inequalities in learning

Looking at more than performance

- › Exposure to mathematics
- › Teaching techniques
- › Country specific and OECD averages

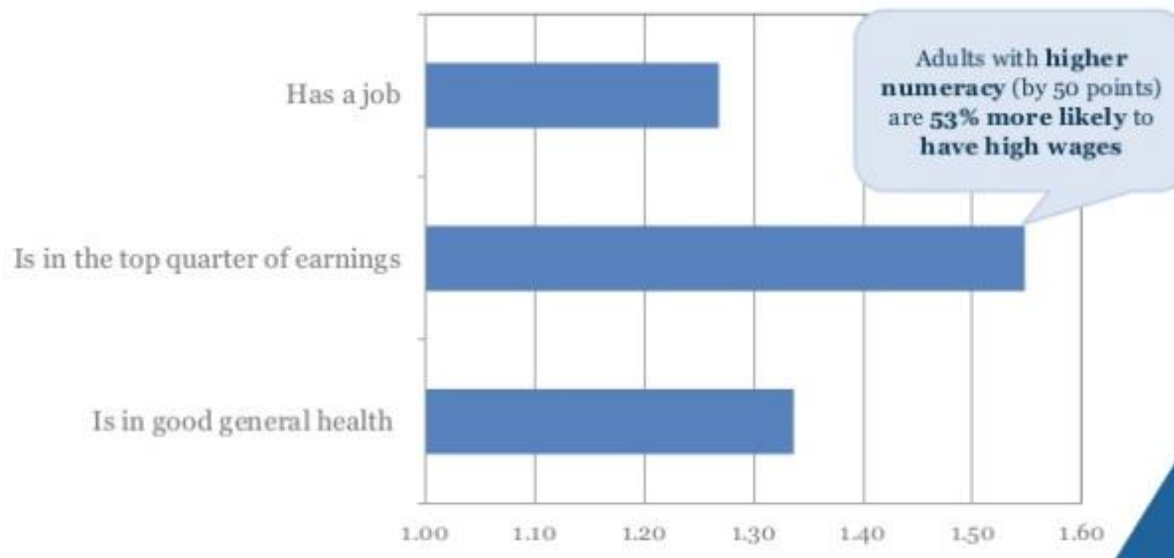


Why do Numeracy and Problem Solving Skills Matter?

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Influence on Wages

- › Years of education and proficiency in numeracy accounts for almost 30% of wage variation.
- › Those who score at the highest levels of skill proficiency had on average income 65% higher than those who scored at the lowest level of proficiency .

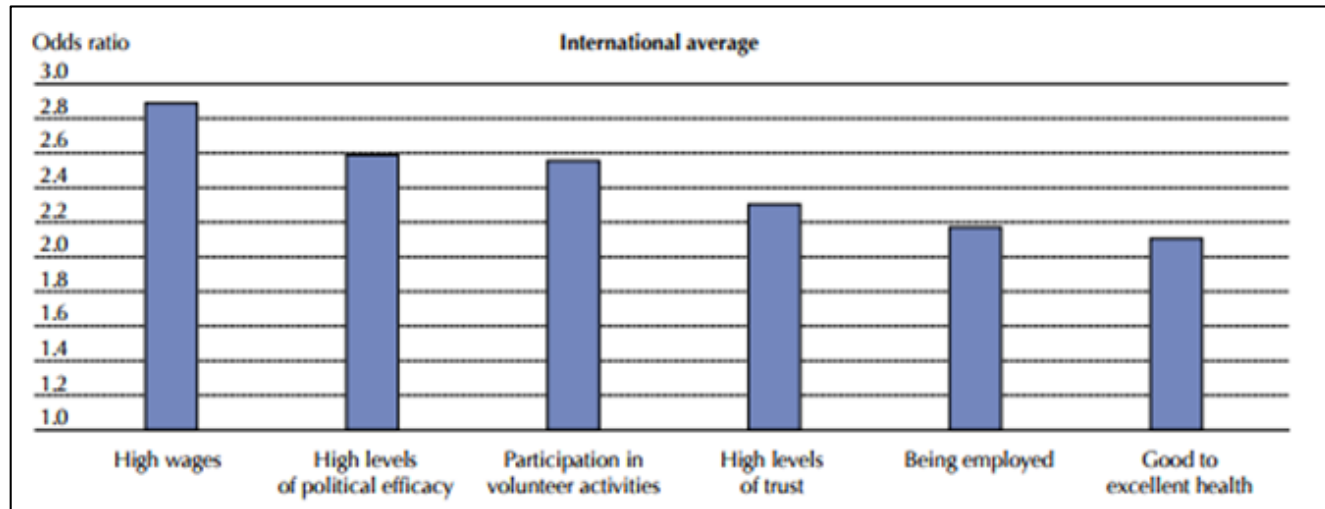


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What we can learn from other large-scale assessments (PIAAC)?

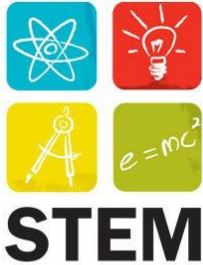
PIAAC (Survey of Adult Skills):

- › Assessment of skills in adults impact more than earnings and employment, these skills affect political involvement, health, and volunteer activities.
- › Insight into how to address challenges in policy issues and who will benefit most from increases in education.



Likelihood of positive social and economic outcomes amongst high performing adults

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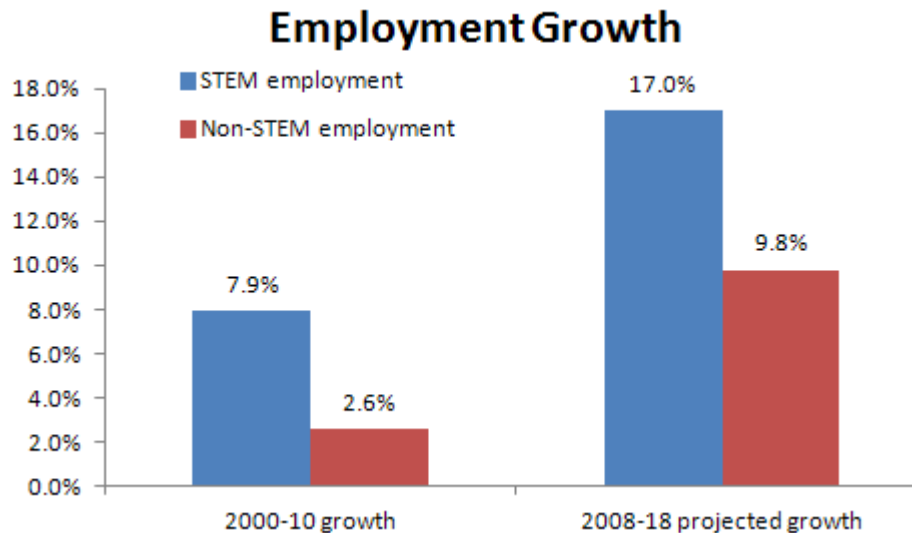


science • technology
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Looking towards the future: STEM Education and Employment

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- › Rise of employment in STEM related fields has increased 12% from 2000 to 2013.
- › As the world advances in technologies, it is more important than ever to have people who can understand and critically analyse technologies and mathematic systems.



Conclusion

Continuing Education in Mathematics is Vital

- › Increased motivation for mathematics, ability to solve problems
- › Increased likelihood of employment and increased wages

How to we change the narrative

- › Simple increases in exposure can encourage participation in Mathematics
- › Broaden exposure to the benefits of Mathematics in work and real world situations

Large-scale assessments (PISA and PIAAC)

- › Give an insight to the state of education – overarching themes and country specific information
- › Provide policy recommendations to provide more beneficial teaching practices and continued learning tools



