



84th International Scientific
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Profiles of Low- and High-Performing Students in an International Comparison: TIMSS 2023 and PISA 2022

Ph.D. Mihno L., Dr. Kiseļova R.

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“Dalība starptautiskos izglītības pētījumos izglītības kvalitātes monitoringa sistēmas attīstībai un nodrošināšanai”



TIMSS 2023

An IEA study measuring achievement in **mathematics and science** for Grade 4 and Grade 8. This analysis compares student groups relative to the international benchmark of **500 points**.

PISA 2022

An OECD study assessing 15-year-olds. This secondary analysis focuses on students with **low performance across all three domains** — mathematics, reading, and science — defined as the **lowest quartile in all three areas simultaneously**.

Research Aim

→ Compare profiles

Contrast low- and high-performing student profiles across family background, school context, wellbeing, engagement, and self-efficacy — with emphasis on risk factors in the low-achievement group.

→ Define methods

TIMSS: two groups split at 500 pts (low: below 500 in both subjects; high: top 12%/15%, thresholds 574 math / 564 science). PISA: lowest quartile in all 3 domains, using student and principal survey data.

→ Identify implications

Outline what the findings mean for schools and educators working with low-achieving students, and how TIMSS and PISA findings align.



Low-Achieving Student: Individual Profile



Home Resources & SES

Fewer learning resources at home; lower parental education and occupational status.



Early Readiness

Fewer early literacy and numeracy activities; activities; lower readiness when starting school.



Safety & Peer Relations

More bullying; weaker sense of safety and support at school.



Self-Confidence & Digital Self-Efficacy

Lower confidence in mathematics and science; science; lower digital self-efficacy.



Attitudes & Well-Being

Less enjoyment of mathematics; more absences, hunger, and fatigue.



Low-Achieving Student: Individual Profile



Sociodemographics

Lower ESCS; often male; frequently speaks a different language at home.



Personal Traits

Lower perseverance and curiosity; weaker emotional control but better stress resilience.



Mathematics Attitudes

Lower self-efficacy, higher anxiety, less positive self-perception, weaker growth mindset.



Study Habits

Less homework; more paid work and household duties; more truancy.



Home Environment

Fewer educational resources and more limited ICT access at home.



School, Classroom & Teacher Context



Classroom Environment

More disruptive lessons; lower clarity in science instruction.



Teacher Profile

No significant differences in age, experience, or formal education between groups.



School Context

Lower academic emphasis; more disadvantaged socioeconomic composition.

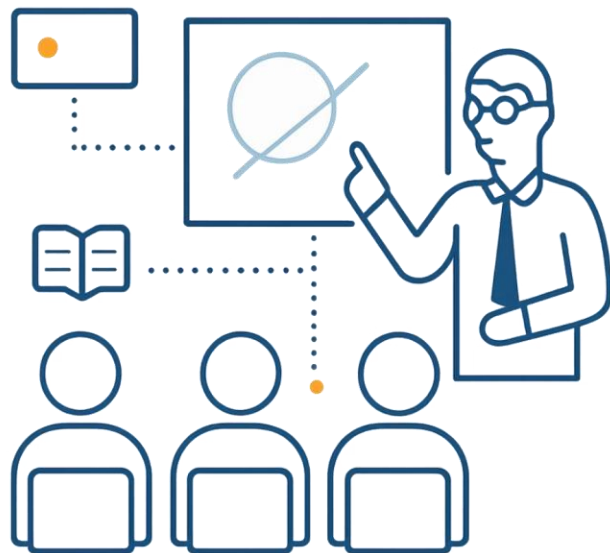


Instructional Practices

Fewer differences overall; some gaps in cognitive engagement depth in mathematics.
mathematics.



School, Classroom & Leadership Context



Belonging and Safety

Weaker sense of belonging, lower safety, more bullying, and a more problematic school environment.



Resources and Staff

Staff shortages, fewer qualified teachers, less professional development, and fewer extracurricular activities.



School Climate

Negative student behaviour hinders learning more often, alongside a poorer disciplinary background.



Leadership and Teaching

Teachers are more involved in decision-making, making, but principals are less engaged in instructional leadership and teacher support is weaker.



Shared Profile: What Both Studies Reveal

Lower SES & Home Resources

Both studies link lower achievement to disadvantaged family backgrounds and fewer educational resources at home.

Language as a Risk Factor

Speaking a different language at home is consistently associated with lower achievement in both studies.

Weaker Learning Capital

Lower self-efficacy and confidence, particularly in mathematics; TIMSS also highlights digital self-efficacy.

Adverse School Climate

More disruptive environments, weaker belonging and safety, and more bullying in both datasets.



Recommendations for Policy and Practice

01

Early Intervention

Target language, mathematical thinking, and thinking, and early diagnostics before school and in grades 1–2

02

Resource Equalisation

Direct materials, digital resources, and after-school support to lower-SES students and schools

03

Build Self-Efficacy

Embed structured feedback, differentiation, differentiation, and a safe culture of mistakes mistakes into teaching

04

Safe School Environment

Implement systematic anti-bullying standards, procedures, and and monitoring

05

Classroom Quality

Strengthen clarity, classroom management, and cognitive engagement engagement (arguing, explaining, applying)





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