84th International Scientific Conference of the University of Latvia 2026

Mechanisms for Reducing Achievement Gaps Among Students with Different Home and School Language Use: TIMSS 2023

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What is TIMSS?

International Assessment

Mathematics and science achievement study with 28 years of comparable trend data (1995–2023)

Participants

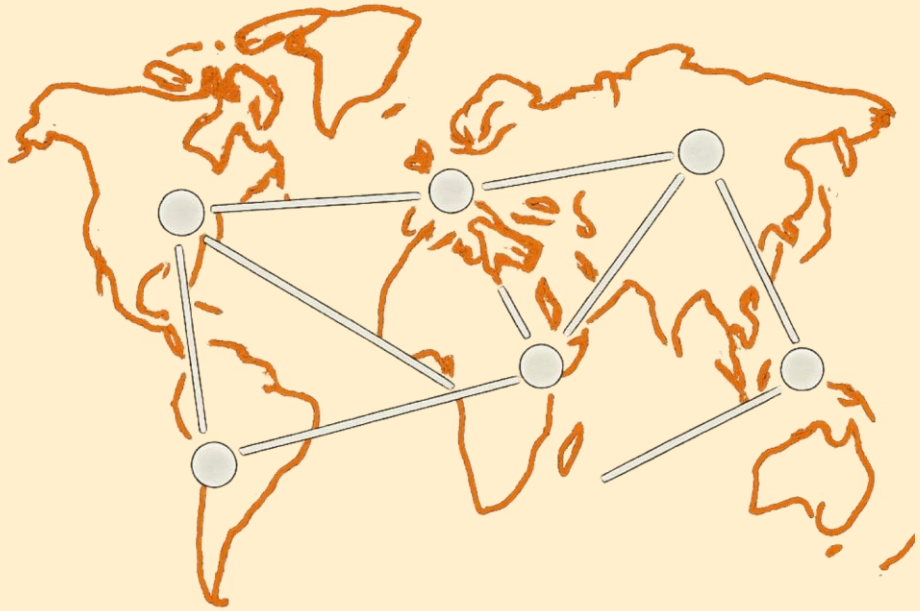
Representative samples of Grade 4 and Grade 8 students from participating countries worldwide

Fully Digital (2023)

First fully computerised TIMSS cycle, enabling richer contextual data collection

Contextual Data

Surveys from students, parents, teachers, and principals, plus system-level curriculum information



RESEARCH RELEVANCE

Why Does the Language Barrier Matter?

- **Globalisation and migration** are increasing linguistic diversity in classrooms worldwide
- **UNESCO (2025):** ~40% of students globally do not learn in a language they fully understand
- **Monolingual policies** risk reinforcing segregation and deepening educational inequality

Research aim: Using TIMSS 2023 data to identify factors affecting mathematics achievement when home language ≠ school language, and to inform policy on language transition and school support measures.

Methodology

achievements “sometimes/never” ≥ “always”

Singapore 43%
Morocco 42%
Canada 29%
Group 1
New Zealand 24%
Australia 21%
England 21%
Kazakhstan 20%

achievements “sometimes/never” < “always”

United Arab Emirates 54%
Macao SAR 31%
Spain 32%
Cyprus 28%
Belgium (Flemish) 29%
Group 2
Germany 26%
Belgium (French) 26%
Sweden 23%
United States 23%
France 21%
Netherlands 21%
Bulgaria 20%

Analytical approach: Oaxaca–Blinder decomposition of the performance gap between two groups
Top-15: The 15 factors with the largest absolute contribution to each component

Results

achievements “sometimes/never” ≥ “always” vs **achievements “sometimes/never” < “always”**

start with different resources (for example, family resources, parents’ education, etc.)

the same factors affect achievement in a similar way

the gap is **not only** about **starting resources**

the same factors work differently for the two groups — improvements in resources or school support can bring a **larger benefit** for students who sometimes or never speak the test language at home

Conclusions

Linguistic Diversity Requires More Than Monolingual Policy

Students whose home language ≠ school language need targeted support mechanisms beyond a single-language approach

Structural Factors Amplify Achievement Gaps

Lower SES, parental education, and home learning resources compound language barriers — compensatory support is essential

School-Level Interventions Criticala

Belonging, self-efficacy, motivation, and language-sensitive STEM teaching are key levers at the classroom level

Build Teacher Capacity for Multilingual Classrooms

Teachers need language support strategies and skills to develop students' academic language alongside content

Additional Language Use in STEM: Contextual, Not Universal

Using home languages in STEM can help, but must be balanced with national language goals

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