CCNETWORK Regional Comprehensive Center Northwest

Improving math outcomes among multilingual students

Multilingual students identified as English learners bring valuable personal, linguistic, and cultural assets that can support academic success. The achievements of former English learners demonstrate these strengths.[1] However, educators may find it difficult to identify evidence-based instructional practices and programs that build on these assets. The Northwest Comprehensive Center created this resource to help Oregon district leaders and educators identify practices and programs that improve math outcomes among multilingual (ML) students. This resource identifies five strategies:

1. Teach students math terms so they can share their understanding of math concepts
2. Use visual tools like number lines to help students understand math ideas
3. Provide direct instruction on word problems to help students understand math and how to apply it
4. Provide ML-focused professional learning to math teachers and support them as they collaborate with peers
5. Implement K–12 dual language programs and make sure ML students classified as English learners can access them

For each strategy we address the estimated implementation time, the most appropriate settings and student populations, how to get started, and where you can learn more. Not every strategy will be practical or appropriate for every district or school.

These strategies are supported by rigorous research that is aligned with Every Student Succeeds Act (ESSA) tiers of evidence. We identify strategies with **STRONG EVIDENCE,** including findings from at least one randomized controlled trial and multiple correlational studies. We also identify strategies with **ML EVIDENCE,** showing positive effects for students classified as English learners. A database of the research is available.

These strategies are not necessarily the most effective ways to improve student outcomes overall. These strategies focus on what districts and schools can do to support math learning for ML students.

The Oregon Department of Education's Multilingual Learner Strategic Plan identifies four priority areas to support English learner students and families:

- **Authentic and responsive community engagement and partnerships**
- **Transformative educators and administrators**
- **Systems, instruction, and assessment improvements**
- **Pathways to multilingualism**

Throughout this brief, we use icons to identify the intersection between each strategy and the four priorities.

Instructional strategies to improve math outcomes

Estimated implementation time: 1–2 years



Strategy 1. Teach students math terms so they can share their understanding of math concepts **STRONG EVIDENCE**

Strategy 2. Use visual tools like number lines to help students understand math ideas **STRONG EVIDENCE | ML EVIDENCE**

Strategy 3. Provide direct instruction on word problems to help students understand math and how to apply it **ML EVIDENCE**

Most appropriate settings and student populations. These instructional strategies can be used by elementary school teachers[2] and can also be extended to secondary school. Studies in Oregon and throughout the United States show that direct instruction on math language and word problems[3] and using visual representations[4] help general population students in grades K–5 understand math. Since these are classroom-based instructional strategies, there is reason to believe that they are also effective among ML students and may be beneficial for students at the secondary level. Planning for math instruction that integrates language access may support teachers who are focused on the needs of multilingual learners.

How to get started

Districts can offer professional development, coaching, and peer learning so all teachers learn to integrate these strategies in their daily practice. This might include adding these strategies to district professional development calendars or creating professional learning communities to explore them in depth.

Learn more

What Works Clearinghouse Practice Guide: Assisting Students Struggling with Mathematics: Intervention in the Elementary Grades

Professional development to improve math outcomes

Estimated implementation time: 3-plus years



Strategy 4. Provide ML-focused professional learning to math teachers and support them as they collaborate with peers ML EVIDENCE

Most appropriate settings and student populations. Studies show that professional development helps teachers improve their practice[5] and improves student achievement.[6] Well-prepared teachers are one of the most important factors in making sure students get the instruction they need to succeed.[7] Research studies in Oregon[8] and nationally[9] show that students' math performance is higher in classrooms where teachers regularly collaborate with English learner specialists. Professional development programs that provide in-depth coursework and teaching practicums that culminate in an English for Speakers of Other Languages (ESOL) endorsement in Oregon[10] and other states[11] may improve student outcomes among diverse ML students in grades K–12.

How to get started

Districts can provide educators with consistent access to high-quality training focused on supporting MLs. They can also prioritize hiring teachers with ESOL or similar endorsements and partner with educator preparation programs to help teachers earn these credentials at no or low cost through state or federal funding. In addition, districts can develop grow-your-own teacher programs using available state and federal funds.

Learn more

Effective Teacher Professional Development

Grow Your Own Educators: A Toolkit for Program Design and Development

System changes to improve math outcomes

Estimated implementation time: 3-plus years



Strategy 5. Implement K–12 dual language programs and make sure ML students classified as English learners can access them STRONG EVIDENCE | ML EVIDENCE

Most appropriate settings and student populations. Dual language and bilingual programs teach students in both English and a partner language. They help students become skilled in two languages, learn to read and write in both languages, succeed in grade-level schoolwork, and develop the social and cultural skills they need to interact successfully with others. Multiple studies have demonstrated that these programs are effective to improve math performance among diverse ML students in grades K–12 in

multiple settings.[12] Dual language programs benefit students who speak the partner language at home (for example, Spanish), students who speak English at home, and students who speak other languages.

How to get started

Districts can explore dual language research and different language allocation models. They can analyze student enrollment data by home language to understand local needs. They can also involve families and community members in planning decisions through a formal advisory board or by providing other ways for them to share ideas and feedback.

Learn more

Guiding Principles for Dual Language Education

Office of English Language Acquisition Dual Language Immersion Playbooks

Endnotes

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