

RESEARCH IN BRIEF

Teacher perspectives on pathways for equitable math instruction for California's multilingual students

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EQUITABLE MATH INSTRUCTION FOR CALIFORNIA'S MULTILINGUAL STUDENTS

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Over one million of California's students—nearly 20%—are classified as English Learners (ELs), and in 2019, 87.4% of those students did not meet grade-level expectations for math standards. As educators and policymakers consider how to improve the education for ELs in K-12 schools, they must prioritize adopting and using instructional materials that integrate evidence-based language and literacy support. Instructional materials can be a valuable resource for teaching and learning (Ball & Cohen, 1996), and researchers have found significant gains in student achievement when teachers use high-quality, standards-aligned instructional materials (Koedel & Polikoff, 2017; Koedel et al., 2017; Reys et al., 2003). However, many teachers of multilingual students do not have access to instructional materials that are appropriate for their students. Research in mathematics education tells us that teachers who receive comprehensive professional development around instructional strategies that center on the learning needs of ELs are better equipped to encourage their EL students' ability to participate in classroom discussions (Chval et al., 2014; Zahner et al., 2021). Participation in discussion-based lessons is, in turn, associated with increased learning outcomes (Banes et al., 2020; O'Connor et al., 2015).

This resource promotes the use of asset-based language in describing students and identifying ways our education systems can best support them. To that end, we frequently describe students as “multilingual” and “emergent bilingual” to recognize the linguistic assets they bring with them into the context of schooling. However, we recognize that the term “English learner” is still frequently used in the field and is referenced in foundational documents such as California’s English Learner Roadmap. Therefore, depending on the context and references, readers will see a range of terms used to describe this student population.

In the summer of 2021, the English Learners Success Forum (ELSF) fielded a national survey.¹ It examined teachers’ views of the value of their instructional materials for teaching ELs and identified areas where the curriculum could better support English learners’ access to grade-level mathematics content and language standards. In an exploratory analysis of the responses from the 156 California math teachers who took the survey, four key findings emerged:

1. Elementary teachers broadly used the curriculum adopted by their district, while most secondary teachers used self-created materials on a daily basis.
2. Most teachers reported that their curricular materials were aligned with the math content standards. Yet, only half responded that their materials helped them to tailor instruction to support English learners.
3. The majority of teachers reported that their materials lack relevance for students.
4. The majority of teachers reported that their materials do not support them to assess or provide feedback on English learners’ development of math language.

These findings indicate that district curricula are falling short of adequately serving multilingual students and their teachers. It is critical that policymakers at the state and local levels listen to the experiences of teachers of English learners as they make decisions about the curriculum—decisions that will have a daily impact on students and teachers. In particular, these key findings should inform the California Department of Education, the Instructional Quality Commission, and the State Board of Education’s current revision to the California Mathematics Framework and the list of criteria that will be developed to approve instructional materials under the new framework. Local school boards and district leaders should also consider these findings as they approve adoptions and purchases of curricular materials at the local level.

KEY FINDINGS

FINDING #1: ELEMENTARY TEACHERS BROADLY USED THE CURRICULUM ADOPTED BY THEIR DISTRICT, WHILE MOST SECONDARY TEACHERS USED SELF-CREATED MATERIALS ON A DAILY BASIS.

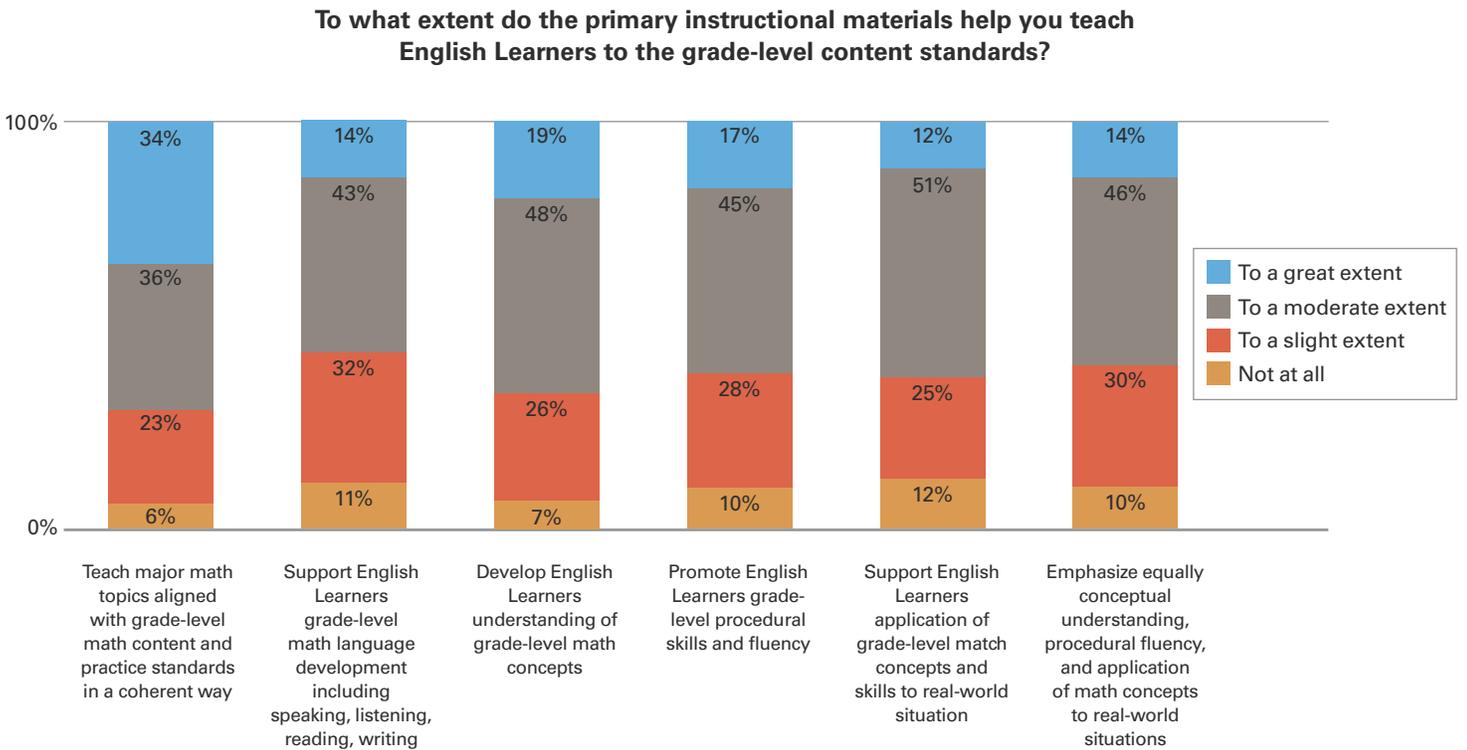
While 70% of teachers reported using their school- or district-recommended instructional materials nearly every day, this response was much more likely from K-5 teachers (86%) than high school teachers (44%). Among high school mathematics teachers, 35% reported they did not use recommended instructional materials, and 21% reported there were no recommended materials. More than half of high school teachers (59%) reported using self-created materials “nearly every day.” We believe that teachers’ time might be better used customizing existing high-quality materials, providing more individualized feedback for students, and maintaining a sustainable work-life balance.

On an open-ended question, teachers who did not use their school- or district-recommended materials wrote that they perceive the grade-level content is too hard for ELs. Further, they shared that the adopted materials are not well-aligned to standards and that materials did not work well for remote learning. For example, one teacher wrote that they do not use the school-adopted materials because “It takes too much time to break down the text and vocabulary before being able to engage the problem.” We interpret this response (and several similar responses) as an indication that either (1) teachers need better quality materials written with multilingual learners in mind, or (2) given quality materials, teachers need better, asset-based professional development and implementation guidance in the materials (Davis et al., 2017).

Finding #2: Most teachers reported that their curricular materials were aligned with the math content standards. Yet, only half responded that their materials helped them to tailor instruction to support English learners.

The most positive responses were in the set of questions under the header “To what extent do the primary instructional materials help you teach English Learners to the grade-level content and language standards in math?” In this section, more than 57% of teachers reported that their materials help reach each indicator “to a great extent” or “to a moderate extent” (Figure 1). We interpret these responses to indicate that, in general, teachers feel their materials are aligned with standards.

FIGURE 1: Responses to questions about the interdependence of mathematical content, practices, and language

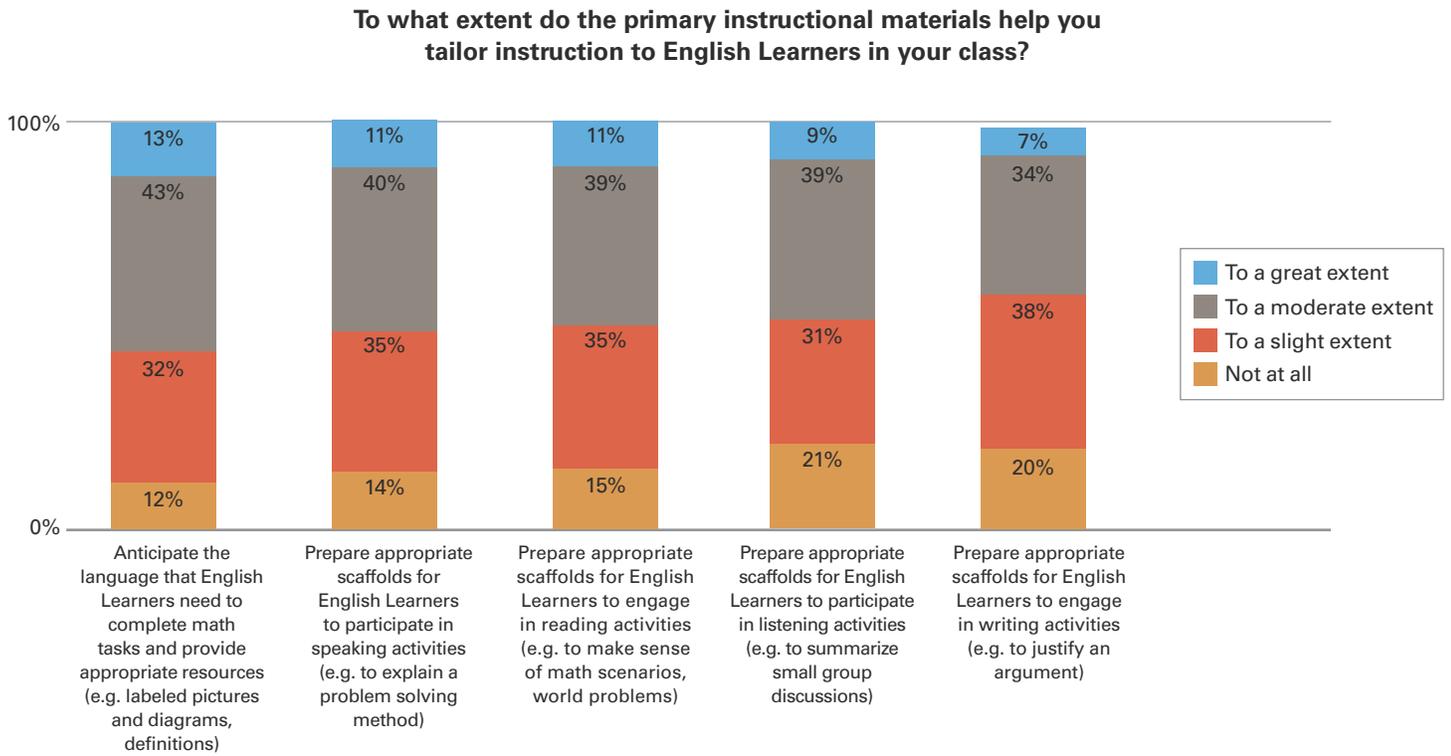


Teachers were more evenly split—50% positive and 50% negative—in response to the set of questions under the header “To what extent do the primary instructional materials help you tailor instruction to English Learners in your class?” (see Figure 2). In these responses, teachers are less positive about using their materials to develop scaffolds for language when teaching ELs.

“Students need more of the conceptual understanding – using manipulative. Students need language supports to have academic discourse – not vocabulary in isolation.”

—Teacher survey response.

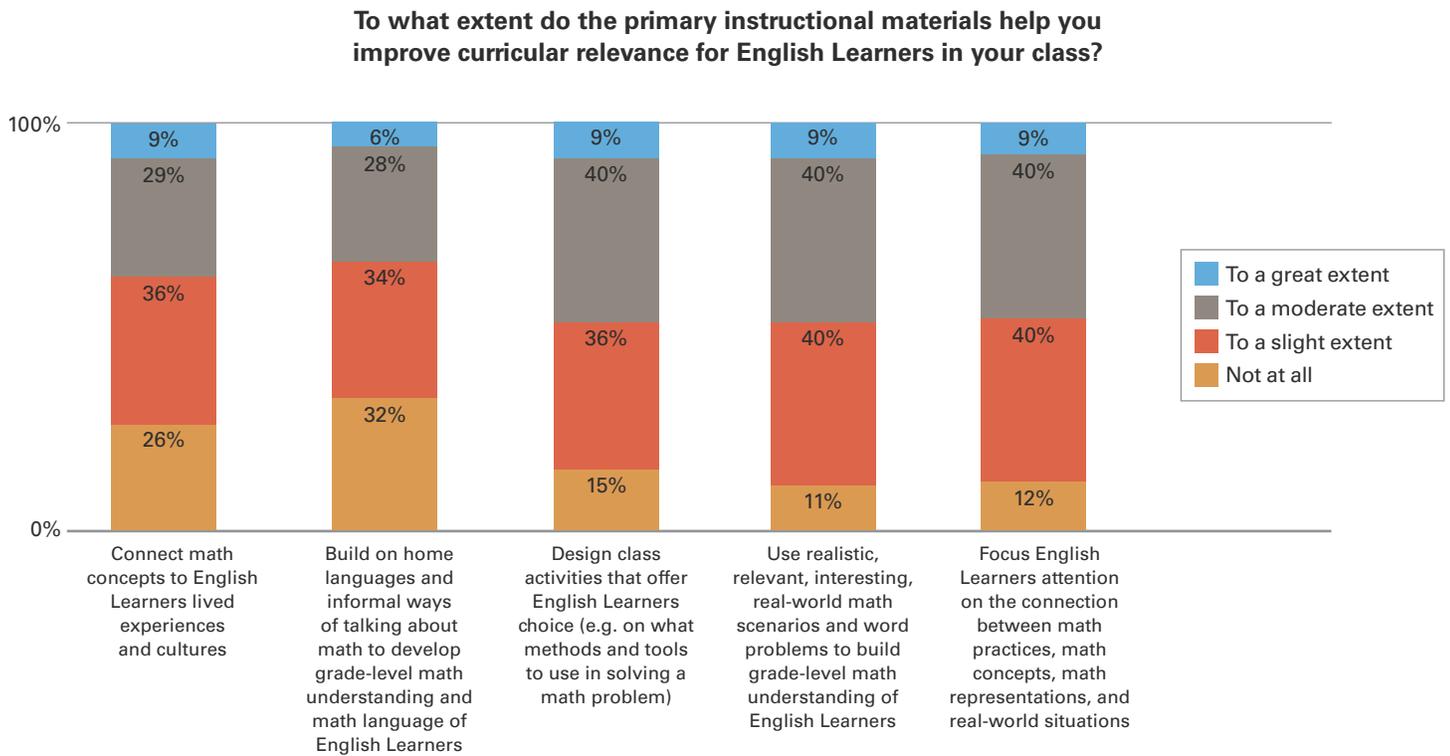
FIGURE 2: Responses to questions about scaffolding and supports for simultaneous development of mathematics and language



FINDING #3: A MAJORITY OF TEACHERS REPORTED THAT THEIR MATERIALS LACK RELEVANCE FOR STUDENTS.

The teachers provided more negative responses to questions in the focus area of curricular relevance. Notably, 62% of the California teachers reported that their curriculum materials did not “Connect math concepts to English Learners’ lived experiences and cultures” (see Figure 3).

FIGURE 3. Curricular relevance.



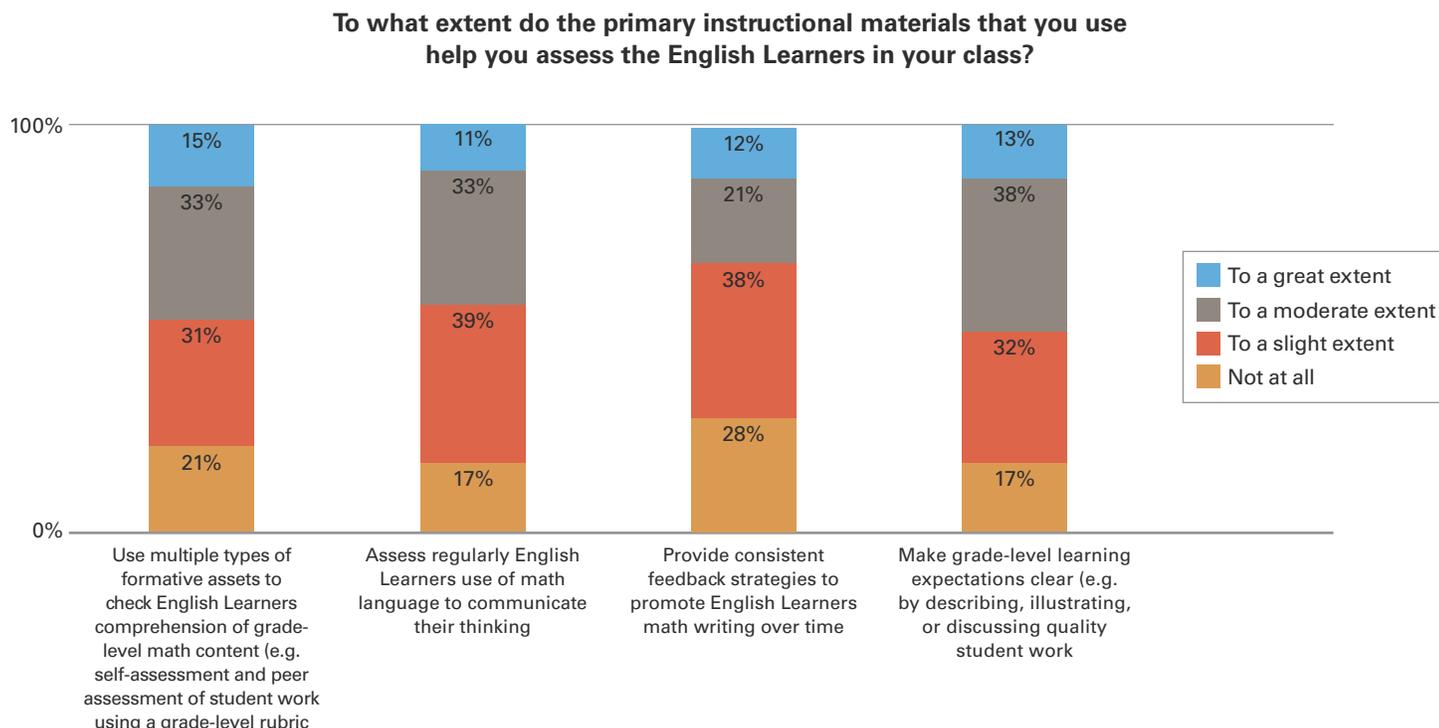
FINDING #4: THE MAJORITY OF TEACHERS REPORTED THAT THEIR MATERIALS DO NOT SUPPORT THEM TO ASSESS OR PROVIDE FEEDBACK ON ENGLISH LEARNERS’ DEVELOPMENT OF MATH LANGUAGE.

The teachers provided more negative responses to questions in the focus area of assessment. Specifically, 66% of the California mathematics teachers responded negatively to a question asking whether their instructional materials help them “build on home languages and informal ways of talking about math to develop grade-level math understanding and math language of English Learners.”

Additionally, 56% of the teachers reported that their materials did not support them in regularly assessing English Learners’ use of math language to communicate their thinking in mathematics. Additionally, 66% of the teachers reported that their materials did not support them to “provide consistent feedback strategies to promote English Learners’ math writing over time” (see Figure 4).

Teachers also asked for more professional learning to use instructional materials to teach ELs: “Give a PDF on how to make math centers and give teachers time to get materials together for the activities. Not just tell us and show us, but actually give us the materials to make the centers and activities during a PDF”

—Teacher survey response.

FIGURE 4: Results in the assessment of ELs language in mathematics.

RECOMMENDED ACTIONS

This research brief surfaces perspectives of classroom teachers—a key stakeholder group when making policy decisions about curriculum and instruction. The revision of California’s Mathematics Framework and the subsequent adoption of updated instructional materials presents an opportunity both at the state and local levels to positively influence learning environments for English learners. Further, it’s a chance to ensure that they provide teachers with the tools and guidance needed to give English learners meaningful access to grade-level standards. Drawing upon the teacher perspectives reflected in this brief and a large body of research (see References), we recommend that state and local leaders take the following actions to advance mathematical learning for English learners.

For the State Board of Education:

1. Ensure that the CA Mathematics Framework (in the Instructional Materials chapter) includes guidance for school districts to:
 - Evaluate, adopt, and implement high-quality instructional materials for grades TK-12 that align with the mathematics content standards and the English Language Development standards. The English Learners Success Forum’s Guidelines for Instructional Materials is a valuable resource.
 - Include subject-matter teachers and English language development specialists on district materials adoption committees. This will help ensure that adopted materials support all teachers in grades TK-12 to tailor their instruction towards helping English learners meet grade-level mathematics and language standards.

2. Ensure that the CA Mathematics Framework provides specific guidance to curriculum developers on how to:
 - Revise and align curriculum with the new framework, provide asset-based guidance to teachers, and share tools to support curricular relevance; and
 - Ensure that assessment tools within the curriculum provide teachers and students with timely and actionable feedback on students' mathematics and language development.

For Local Leaders:

3. Include mathematics content teachers and English Language development teachers' voices in the process of adopting high-quality instructional materials. The English Learners Success Forum's Guidelines for Instructional Materials is a useful resource.
4. Commit to effectively adopting and implementing high-quality instructional materials in the classroom paired with ongoing professional learning and support for teachers, teacher coaches, and administrators.

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