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Research Spotlight

Report: Unlocking Learning: Science as a Lever for English Learner Equity
by Sarah Feldman and Verónica Flores Malagon, Education Trust–West

Research Spotlight written by Mary Briggs



New Ed Trust–West report

The report highlights how science instruction can improve opportunities and outcomes for English learners.

Our first **CSBA Research Spotlight** focuses on a comprehensive Education Trust–West report by Sarah Feldman and Verónica Flores Malagon that provides current data about English learners (ELs) and science instruction in California. The January 2017 report includes findings from a study of six districts that are using rigorous, engaging science instruction to improve ELs' science achievement and development of their English language skills. The authors provide detailed examples of the work the exemplar districts are doing to obtain above-average EL science achievement, along with specific recommendations for districts interested in improving EL equity through science instruction.

Science opportunity gaps for English Learners

While research has long highlighted persistent achievement gaps for English learners, the Education Trust–West report provides important data about opportunity gaps in science access for many of California's EL students. A few key facts:

» Instructional time: ELs are less likely to attend elementary schools where teachers report having adequate time to teach science. Additionally, in many schools, legally mandated English Language Development

Welcome to the new CSBA Research Spotlight series

CSBA is committed to sharing current research with our members to inform effective governance and improve outcomes for all of California's public school students. Unlike our traditional research and policy briefs, which summarize findings from a number of studies about specific topics, the CSBA Research Spotlight series will highlight individual new and notable studies to help board members stay current on research that can support the educational decisions they make in their districts and counties. Each CSBA Research Spotlight will include links to the full study and connect the study with potential implications for board members.

(ELD) instructional minutes inadvertently come at the expense of instruction in other subjects, including science (p.3).

- » Access to teachers with science expertise: In middle and high school science, ELs are less likely to be taught by teachers with a strong science background (p.3).
- » Access to rigorous high school science coursework: Only 58 percent of California high schools offer chemistry and 51 percent offer physics. ELs are less likely than their non-EL peers to have access to lab science classes that meet the A-G course requirements for California four-year public college admission. Even when they do, they are less likely to be enrolled in advanced science and math coursework. In fact, only 9 percent of ELs complete A-G requirements, as compared to 42 percent of all students (p. 4)

How can science be an effective strategy for improving outcomes for English learners?

Bottom line: When science and English language development are integrated effectively, districts can simultaneously boost EL achievement in reading, writing, and science.

First, schools must not wait until students obtain a minimum English proficiency level before including them in engaging, rigorous science content. Effective science programs allow **simultaneous development of science concepts, English language proficiency, and problem-solving skills** — and this report highlights examples of ways that several California school districts are doing just that. Second, the California Next Generation Science Standards (CA NGSS) encourage **instructional approaches that also provide rich opportunities for ELD through collaborative conversations with peers**. ELs need more opportunities to practice English in a variety of settings, and collaboration in academic courses such as science is essential. Third, science often relies on **hands-on learning, demonstrations, and visual representations of data (e.g., diagrams, charts, tables, and equations)**. These offer additional information and support students' understandings of science concepts. Finally, research from a sample of elementary schools shows that **projects that integrate ELD and science increase teachers' belief in the academic capacity of their EL students** (p. 5).

“Students do not need to wait until they learn English in order to engage in scientific thinking and complex scientific content.”¹

Recommendations for districts

Based on their study of the six exemplar districts, along with findings from recent research, Ed Trust-West provides concrete recommendations aimed at district leaders. Administrators and board members can review the recommendations and collaborate to use high-quality science instruction as a lever for EL equity. Key recommendations, outlined below, are described in detail in the full report (pp. 17-18).

1. Invest a portion of Local Control Funding Formula (LCFF) funds in NGSS-aligned science instruction that will increase opportunities for EL students, and ensure Local Control and Accountability Plan (LCAP) goals reflect this approach. Investments include materials, training, time for collaboration, and staffing to support CA NGSS and California ELD integration.

2. Request data to ensure the district provides equitable access to a rigorous science education for ELs, including instructional time and courses that lead to A-G completion. Verify that secondary schools are providing language supports to enable ELs to excel in college preparatory coursework. Use the data to develop specific goals to address any existing inequities and seek recommendations from district staff.
3. Ensure the district provides high-quality science instructional materials that are both aligned to CA NGSS and designed to support ELD.
4. Engage families in the district process of implementing ELD and science standards, including planning to expand multilingual learning opportunities. This includes ensuring that families, particularly of EL students, feel welcomed and have information about standards implementation and about the requirements of college preparatory science. Aim to offer access to multilingual learning opportunities when possible. If the community feels more multilingual opportunities would be beneficial but are currently beyond your district's capacity, explore options for what might make it feasible.
5. Invest in teacher capacity to support CA NGSS science learning for ELs and provide adequate time for high-quality professional learning for teachers and administrators. Ensure teachers have time for collaborative science instructional planning, as well as access to ELD and science education experts to support effective implementation.
6. Identify opportunities to develop district partnerships to support science education for EL students and training for teachers. These partnerships might include science education institutions, universities, and STEM-related businesses that can further support CA NGSS implementation.

California's English Learners at a Glance

About 4 in 10 public school students speak a language other than English in their homes.

- » More than 1 in 5 students are currently classified as ELs (grades K-12)
- » About 7 in 10 ELs are enrolled in grades K-6, with the remaining 3 in 10 ELs enrolled in grades 7-12.
- » More than 8 in 10 ELs are Spanish speakers

Source: California Department of Education (<http://bit.ly/19HDbU7>)

Board members who read the full report will find:

- » Detailed descriptions of how six California districts are implementing the practices recommended in the report
- » A compilation of questions to ask administrators about the district's current approach to science and ELs
- » Additional facts about science achievement and California's English learners

Access the full Ed Trust-West report, an annotated bibliography, and a link to the archived webinar at: <http://bit.ly/2jxfiLb>

Endnotes

- 1 Gomez-Zwiep, S., & Straits, W. J. (2013). Inquiry science: The gateway to English language proficiency. *Journal of Science Teacher Education*, 24, 1315-1331.

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