

# Improving Educational Outcomes for English Learners in the Middle Grades



**The CREATE Briefs Collection**





# **Improving Educational Outcomes for English Learners in the Middle Grades**

**The CREATE Briefs Collection**



**Reports from the Center for Research on the Educational Achievement and Teaching of English Language Learners**

**October 2012**

## Improving Educational Outcomes for English Learners in the Middle Grades: The CREATE Briefs Collection

The briefs in this compilation were produced by the Center for Research on the Educational Achievement and Teaching of English Language Learners (CREATE) with funding from the U.S. Department of Education (ED), Institute of Education Sciences, under Contract No. ED-R305A05056. The opinions expressed herein do not necessarily reflect the positions or policies of ED.

Electronic versions of this compilation and of each individual brief can be obtained at [www.cal.org/create](http://www.cal.org/create). Individual briefs and this compilation may be reproduced and disseminated in hard copy for educational, nonprofit purposes, but such reproductions may not be sold for commercial purposes or financial gain.

Other websites are welcome to link to the briefs on the CREATE website, but this compilation may not be reposted on other websites.

### **Recommended citation:**

Center for Research on the Educational Achievement and Teaching of English Language Learners. (2012). *Improving educational outcomes for English learners in the middle grades: The CREATE briefs collection*. Washington, DC: Center for Applied Linguistics.

[www.cal.org/create](http://www.cal.org/create)



## About CREATE

### Meeting an Educational Challenge

Many students reach the middle grades (4–8) lacking the language and literacy skills required to access grade-level content instruction and texts. English learners in the middle grades must also contend with the additional challenge of developing language and literacy skills in a second language. In these critical grades, English learners lag behind their English proficient peers in content area knowledge as seen on the National Assessment of Educational Progress (National Center for Education Statistics, 2011). Additionally, when English learners reach high school, these students have higher drop-out rates than their English proficient peers (Chapman, Laird, Ifill, & KewalRamani, 2011).

Despite the unique strengths and needs of English learners in the middle grades, there is little research on effective instruction for these students (Biancarosa & Snow, 2004). The National Center for Research on the Educational Achievement and Teaching of English Language Learners (CREATE) has a focused program of research designed to address the critical challenge of improving the educational outcomes of English learners in content area classrooms by

- enhancing the empirical research base for the development of language and literacy in Grades 4–8;
- developing and testing effective interventions that promote content knowledge and language and literacy development simultaneously;
- investigating the features of scaffolded instruction that facilitate learning for English learners in content area classrooms (e.g., oral language development, shared interactive reading, direct vocabulary instruction, traditional text v. modified text);
- designing, testing, and delivering professional development that ensures that teachers implement effective classroom practices to help English learners achieve high standards; and
- implementing a comprehensive school-wide intervention delivering curricula, professional development, and coaching sessions for content areas teachers.

---

Biancarosa, C., & Snow, C. E. (2004). *Reading next—A vision for action and research in middle and high school literacy: A report to the Carnegie Corporation of New York* (2nd ed.). Washington, DC: Alliance for Excellent Education.

Chapman, C., Laird, J., Ifill, N., & KewalRamani, A. (2011). *Trends in high school dropout and completion rates in the United States: 1972-2009* (NCES 2012-006). Washington, DC: National Center for Education Statistics.

National Center for Education Statistics. (2011). *National Assessment of Educational Progress (NAEP) 2011 assessment*. Washington, DC: U.S. Department of Education.

## **A Multi-Year Program of Research**

### **Research Years 1-4: Individual Projects**

During the first 4 years of the CREATE study, researchers developed individual interventions and tested them in tightly controlled experiments and randomized field trials with classroom teachers in the middle grades. The content areas of focus included social studies, English language arts, and science. CREATE researchers also investigated the impact of the SIOP Model on science and language learning.

### **Research Years 5-6: School-Wide CREATE Intervention**

The educational strategies investigated in the individual projects were integrated into a school-wide intervention that was implemented and studied over the course of 2 years. The purpose of the intervention was to determine whether the consistent development of academic language and literacy skills, in addition to the development of content skills, would yield improved academic outcomes for English learners. The intervention focused on teacher guided methods and peer collaborative work to develop vocabulary, academic language, and reading comprehension skills within the context of content area instruction. In addition, the SIOP Model was used as an overarching framework for effective delivery of instruction that supports content knowledge learning and language and literacy development across all content areas.

The intervention was conducted in seventh-grade classrooms across critical content areas. Teachers in seventh-grade social studies, English language arts, and science classrooms received content curricula, SIOP professional development, and instructional coaching. Seventh-grade math teachers received SIOP professional development and weekly instructional tips.

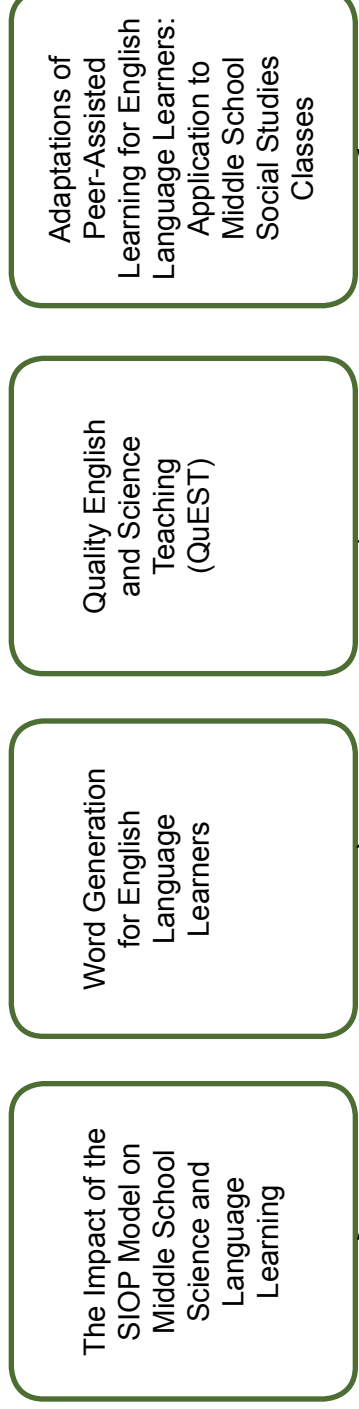
### **Dissemination**

Throughout the 7-year CREATE program of research, findings and instructional implications were disseminated through the CREATE website, annual CREATE conferences, webinars, research briefs, journal publications, and presentations at national conferences and conventions. A book describing the 2-year school-wide intervention, *English Learners in Content Area Classes: Teaching for Achievement in the Middle Grades*, is in development.

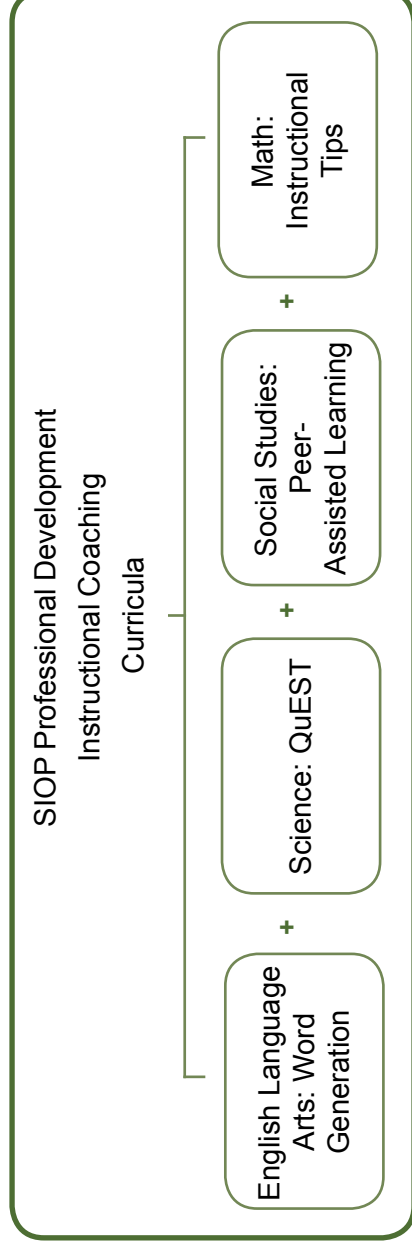
**[www.cal.org/create](http://www.cal.org/create)**

# Center for Research on the Educational Achievement and Teaching of English Language Learners

## Research Years 1–4: Individual Projects



## Research Years 5–6: School-Wide CREATE Intervention



## Dissemination Years 1–7

- Website
- Electronic list announcements
- Webinars
- CREATE conferences
- Research briefs
- Professional journal articles
- *Improving Educational Outcomes for English Learners in the Middle Grades: The CREATE Briefs Collection*
- CREATE book: *English Learners in Content Area Classes: Teaching for Achievement in the Middle Grades*

## CREATE Partners

CREATE is a partnership of researchers working under a contract awarded to the University of Houston by the U.S. Department of Education, Institute of Education Sciences:

 <a href="http://www.csulb.edu">www.csulb.edu</a>	<b>California State University, Long Beach</b> Jana Echevarría and Catherine Richards-Tutor <i>SIOP Intervention</i>
 <a href="http://www.cal.org">www.cal.org</a>	<b>Center for Applied Linguistics</b> Deborah Short and Jennifer Himmel <i>SIOP Professional Development and Intervention</i>  Diane August and Annie Duguay <i>Science Intervention</i>  Carolyn Adger and Julie Mazrum <i>Dissemination</i>
 <a href="http://www.gse.harvard.edu">www.gse.harvard.edu</a>	<b>Harvard University</b> Catherine Snow and Claire White <i>Word Generation Intervention</i>
 <a href="http://www.meadowscenter.org">www.meadowscenter.org</a>	<b>Meadows Center for Preventing Educational Risk University of Texas at Austin</b> Sharon Vaughn, Leticia Martinez, and Colleen Klein Reutebuch <i>Social Studies Intervention and Coaching</i>
 <a href="http://www.tlc2.uh.edu/times">www.tlc2.uh.edu/times</a>	<b>Texas Institute for Measurement, Evaluation, and Statistics, University of Houston</b> David J. Francis and Coleen D. Carlson <i>Leadership</i>
 <a href="http://www.berkeley.edu">www.berkeley.edu</a>	<b>University of California, Berkeley</b> Elfrieda Hiebert <i>Leadership</i>

## Introduction to Briefs

This volume brings together the full set of CREATE research briefs, which provide a closer look at the topics of CREATE's work and address current issues that are relevant to practitioners and other education professionals. Collectively they provide the reader with a comprehensive view of CREATE's program and progression of research. Therefore, the briefs are arranged in chronological order (2009 - 2012).

- ***Using the SIOP Model to Improve Middle School Science Instruction***

Jana Echevarría, California State University, Long Beach  
Deborah J. Short, Center for Applied Linguistics  
May 2009

This brief provides an overview of the SIOP Model and highlights how teachers can develop content and language objectives, emphasize key vocabulary, promote interaction, and incorporate effective review and assessment techniques within the context of middle school science. It provides research-based examples and strategies in order to illustrate how teachers can plan for the successful integration of content and language in science lessons.

- ***Response to Intervention and English Learners***

Jana Echevarría, California State University, Long Beach  
Jan Hasbrouck, Gibson Hasbrouck & Associates, Wellesley, MA  
July 2009

Response to Intervention (RTI) has emerged as a method for providing early academic assistance to students with difficulty learning. This brief outlines the tiered structure of RTI and how it can be implemented as an effective technique for teaching English learners who are having difficulty making academic progress. It touches on methods of assessment and instructional considerations, and it guides educators in tailoring this technique to fit the needs of English learners.

- ***Improving Science and Vocabulary Learning of English Language Learners***

Diane August, Lauren Artzi, and Julie Mazrum, Center for Applied Linguistics  
August 2010

This brief reviews previous research related to the development of science knowledge and academic language in English language learners as well as the role of English language proficiency, learning in a second language, and first language knowledge in science learning. It also describes two successful CREATE interventions that build academic and discipline-specific vocabulary and science knowledge in English language learners.



- ***Effective Social Studies Instruction to Promote the Knowledge Acquisition and Vocabulary Learning of English Language Learners in the Middle Grades***

Colleen Klein Reutebuch, The University of Texas at Austin

December 2010

This brief explains a CREATE intervention that incorporates literacy and language development activities into social studies instruction. It describes lessons designed to increase English language learners' social studies knowledge while simultaneously improving their vocabulary acquisition and overall reading comprehension.

- ***Improving Reading Across Subject Areas With Word Generation***

Joshua F. Lawrence, Claire White, and Catherine E. Snow, Harvard Graduate School of Education

September 2011

This brief describes a quasi-experimental study of Word Generation, conducted in public middle schools in Boston. Word Generation is a robust vocabulary intervention that is implemented across key subject areas. The purpose of the program is to enhance students' vocabulary in support of improved reading comprehension. The brief outlines the details of the intervention and explains how it increases the vocabulary development of all students, including English language learners.

- ***The SIOP Model: A Professional Development Framework for a Comprehensive School-Wide Intervention***

Jana Echevarría, California State University, Long Beach

Deborah J. Short, Center for Applied Linguistics

November 2011

This brief first describes individual interventions that CREATE researchers tested in middle school science, social studies, and language arts classrooms with English language learners over the course of the 2005-2009 school years. The brief then explains how the SIOP Model was used as a professional development framework to unite the separate research studies into a school-wide, comprehensive intervention that was implemented in the 2009-2010 and 2010-2011 school years to support English language learners across the core content areas.

- ***Using Literacy Coaching to Promote the Teaching and Learning of English Learners in Content Areas***

Colleen K. Reutebuch, Meadows Center for Preventing Educational Risk, The University of Texas at Austin

August 2012

This brief describes the literacy coaching that was provided as part of the CREATE research project aimed at improving the teaching and learning of English learners in seventh-grade content areas. Coaching was intended to extend professional development and increase teacher capacity through multiple layers of support that included lesson demonstrations, observations with feedback, and guided teacher reflection and goal setting.

- ***CREATE: A Comprehensive Model for Instruction of Academic Language and Literacy in the Content Areas***

Annie Duguay, Center for Applied Linguistics

September 2012

This brief outlines a systematic school-wide intervention that consistently integrates content knowledge and language and literacy development in content area curricula. The brief first describes the elements of the intervention, including implementation, professional development, and coaching support, in critical content areas. It then explains the instructional implications for teachers and administrators.

- ***Effective Practices for Increasing the Achievement of English Learners***

Jana Echevarría, California State University, Long Beach

October 2012

This research brief highlights two schools' efforts to improve the achievement of their students using the SIOP Model. These schools, one elementary and one secondary, have seen significant improvement in the performance of their English learners through the use of the SIOP Model of instruction, an approach that addresses both academic language development and access to content. The brief outlines how each school has implemented the model and supported teachers through job-embedded professional development.

# iCREATE Briefs

The following pages provide the CREATE Briefs in chronological order.

Each CREATE Brief can also be downloaded in PDF format from the CREATE website.

## Using the SIOP Model to Improve Middle School Science Instruction

Jennifer Himmel and Deborah J. Short, Center for Applied Linguistics  
Catherine Richards and Jana Echevarria, California State University, Long Beach

### Introduction

The achievement gap between English language learners and their English-proficient peers in U.S. schools is persistent and well documented (California Department of Education, 2004; Lee, Grigg, & Donahue, 2007; Siegel, 2002). Research shows that among in-school factors that contribute to student achievement, teachers have the biggest impact. Given this, it is imperative that all teachers know how to make academic content comprehensible to learners who are not yet proficient in English.

One promising approach to improve the academic performance of English language learners is the SIOP (Sheltered Instruction Observation Protocol) Model, an empirically tested, research-based model of sheltered instruction developed by researchers at California State University, Long Beach, and the Center for Applied Linguistics under the auspices of the National Center for Research on Education, Diversity & Excellence (Echevarria, Vogt, & Short, 2008). The SIOP Model is a lesson planning and delivery system that incorporates best practices for teaching academic English and provides teachers with a coherent approach for improving the achievement of their students. Using strategies and techniques that make academic content comprehensible to students, teachers present curricular content concepts that are aligned with state standards. While doing so, teachers are developing students' academic English skills across the four domains—reading, writing, listening, and speaking—in addition to building their academic vocabulary.

Many features of the SIOP Model, such as cooperative learning, reading comprehension strategies, and differentiated instruction, are recommended for high-quality instruction for all grade levels and content areas (Echevarria, Vogt, & Short, 2008; Genesee, Lindholm-Leary, Saunders, & Christian, 2006). However, the SIOP Model adds key features for the academic success of English language learners, such as including language objectives in every content lesson, providing opportunities for oral language

practice, developing background knowledge and content-related vocabulary, and emphasizing academic literacy. It is not a step-by-step approach but rather a framework for organizing best practices. The SIOP Model provides teachers with specific lesson features that, when implemented consistently and to a high degree, lead to improved academic outcomes for English language learners (Echevarria, Short, & Powers, 2006; Short, Fidelman, & Louguit, 2009).

#### SIOP Model

- Lesson Preparation
- Building Background
- Comprehensible Input
- Strategies
- Interaction
- Practice & Application
- Lesson Delivery
- Review & Assessment

### Use of the SIOP Model in Science

Science is a subject with high language demands. As of 2007–2008, it is also one of the subjects in which student assessment is mandatory under the No Child Left Behind legislation. By using the SIOP Model to plan and deliver science lessons, teachers can better meet the unique linguistic and academic needs of their students learning English. Drawing from the middle school science curricular units that we created for the National Center for Research on the Educational Achievement and Teaching of English Language Learners (CREATE), we will highlight key features of the SIOP Model that illustrate ways in which teachers can support English language learners' academic English development and acquisition of science concepts.

### Content and Language Objectives

A central feature of the SIOP Model is the inclusion of content and language objectives for every lesson. Content objectives identify what students will learn and be able

to do in the lesson, and language objectives address the aspects of academic language that will be developed or reinforced. These objectives should be stated in clear and simple language and posted for the students to see. They should be read aloud at the beginning of the lesson so that both teacher and students understand the lesson’s purpose, and reviewed at the end of the lesson to determine whether the objectives were met.

Many teachers already use content objectives to ensure that standards-based curricular concepts are covered in their lessons, but they are less likely to include objectives that support the linguistic development of English language learners. Here are some steps teachers can take to create language objectives. (For further information, see Echevarria, Vogt, & Short, 2008, chapter 2.)

1. Decide what key vocabulary, concept words, and other academic words students will need to know in order to talk, read, and write about the topic of the lesson. Those words might be taught as a language objective. They should include technical terms, such as *ecosystem*, and terms like *distribution* that have different meanings across content areas. Other terms to highlight are those that English language learners may know in one context, such as *family* (as in parents, siblings, etc.), but that have a different use in science (e.g., family of elements in the periodic table).
2. Think about the language skills necessary for students to accomplish the lesson’s activities. Will the students be reading a textbook passage to identify the stages of mitosis? Are they able to read a text passage to find specific information? Will students be reporting what they observe during a scientific demonstration to a peer? Do they know how to report observations orally? Acquiring the skills needed to carry out these tasks might be the focus of a language objective.
3. Identify grammar or language structures common to the content area. For example, many science textbooks use the passive voice to describe processes. Additionally, students may have to use comparative language to analyze two related concepts. Writing with the passive voice or comparative phrases might be a language objective.
4. Consider the tasks that the students will complete and the language that will be embedded in those assignments. If students are working on a scientific investigation together, will they need to explain the steps of the procedure to one another? The language objective might focus on how to explain procedures aloud.

Here are sample language and content objectives from our middle school science lesson on cell theory.

- Language Objective: Students will be able to orally describe three types of cells to a partner.
- Content Objective: Students will be able to produce a visual representation of each of the three types of cells.

It is important that the objectives be measurable. One way to ensure this is to choose appropriate, active verbs such as those in the chart below.

Content	Language
Apply	Compose
Categorize	Scan
Calculate	Discuss
Design	Read
Identify	List
Select	Persuade
Create	State
Hypothesize	Record
Use	Listen

### Emphasis on Key Vocabulary

A consistent finding in reading research is the positive correlation between a learner’s vocabulary knowledge and reading comprehension ability (Baumann, Kame’enui, & Ash, 2003). For example, students must be able to understand 90% of the words in a passage to comprehend the passage independently (Nagy & Scott, 2000). Given this, it is important that teachers include activities and opportunities for English language learners to develop their academic English vocabulary in specific content areas.

We suggest that teachers focus on approximately five vocabulary words per lesson. It is important to list vocabulary words for students to see and to include activities where the students can interact with the words in multiple ways. For example, students can create Four Corners vocabulary cards for all the new terms (see example below). In this activity, students divide a piece of paper into four quadrants, in which they do the following:

- Top left: Write the word.
- Top right: Write a definition in their own words.
- Bottom left: Draw a picture representing the word.
- Bottom right: Write a sentence using the word.

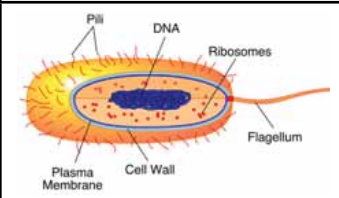
Prokaryote	An organism whose cell lacks a nucleus and some other cell structures
	Prokaryotes live in your intestine.

Image from [www.physicalgeography.net/fundamentals/images/prokaryote.jpg](http://www.physicalgeography.net/fundamentals/images/prokaryote.jpg). Reprinted with permission.

Below is a portion of a middle school science lesson on cells that aims to build the students' academic vocabulary.

- In groups of four, have students read several pages in the textbook on single-celled organisms, multi-cellular organisms, prokaryotes, and eukaryotes.
- Have students list similar and distinguishing characteristics of each type of cell in the appropriate columns on the graphic organizer (see example below).
- To help the students compare and contrast prokaryotes and eukaryotes, write one list of words on the board that signal comparing (*similarly, both, alike, shared*) and another list of those that signal contrasting (*however, on the other hand, different, but*).
- Model writing two sentences comparing and contrasting the characteristics of the organisms.
- Have students write two to four sentences of their own in their notebooks.

	Prokaryote	Eukaryote
<b>Similarities</b>	<ul style="list-style-type: none"> <li>- enclosed by plasma membrane</li> <li>- contains ribosomes</li> <li>- has DNA</li> </ul>	<ul style="list-style-type: none"> <li>- enclosed by plasma membrane</li> <li>- contains ribosomes</li> <li>- has DNA</li> </ul>
<b>Differences</b>	<ul style="list-style-type: none"> <li>- has no nucleus</li> <li>- less developed than eukaryote</li> <li>- contains no organelles independent of the plasma membrane</li> </ul>	<ul style="list-style-type: none"> <li>- has a nucleus</li> <li>- ribosomes are bigger and more complex</li> <li>- contains many organelles with their own membranes</li> </ul>

This part of the lesson offers the students numerous opportunities to learn and use new vocabulary. First the students read passages in the textbook that describe the four types of organisms (single-celled organisms, multi-cellular organisms, prokaryotes, eukaryotes) in detail and then use comparative language to compare and contrast their traits. Finally, students integrate their knowledge of the science vocabulary and comparative language forms to write sentences about the organisms. Note the emphasis on technical words (e.g., *prokaryotes*) and the language of general academic discourse (e.g., *shared, similarly*).

## Frequent Opportunities for Interaction

In order to fully connect with the content concepts and develop a deeper understanding of the content-specific vocabulary, students must have many opportunities to use the language in authentic situations. Additionally, by providing students with multiple opportunities to interact with each other, the teacher creates an environment where every student in the class is developing oral literacy. The typical classroom discussion where the teacher asks a question and one student answers is not conducive to provid-

ing an environment rich in meaningful oral interaction. Teachers need to build activities into the lesson that require students to talk with their peers about the key concepts by using the key vocabulary terms. Fortunately, the hands-on nature of the science classroom fosters opportunities for peer-to-peer discussion of concepts.

The following middle school science activity, “Carousel,” about different types of cells, promotes purposeful interaction about the lesson content.

- Make two sets of three sheets of chart paper. Label each sheet in a set with the name of one of the three types of cells: prokaryote, eukaryote, and bacteria. Post one set along one side of the classroom, and post the other along the opposite side.
- Divide the class in half and have each half divide into three groups. Each group reviews its notes on the three types of cells.
- Assign each group to one of the chart posters on their side of the room.
- Give each group a different colored marker and tell them to write on the chart as many structures in that cell as they can in one minute. When time is up, instruct the groups to move clockwise to the next poster of their set.
- Groups move to another poster and repeat the procedure. If students encounter information from another group that they think is incorrect or have a question about, tell the students to write a question mark next to it.
- Once each group has visited all three posters in their set, go over the information as a class.

In this activity, students discuss the three types of cells with one another in small groups, record their ideas, and review ideas from other groups. Activities like this give English language learners an opportunity to develop oral language proficiency, which is positively correlated with reading and writing ability (August & Shanahan, 2006; Genesee et al., 2006). By structuring the lesson so there is more student interaction and engagement, teachers more effectively develop students' English language proficiency in all domains.

## Review and Assessment

Although the emphasis in education is often on summative assessment (i.e., end-of-year or end-of-unit assessments that determine to what extent learners have mastered specific competencies), formative assessments (i.e., daily, ongoing monitoring through observations, questioning, and informal assessments) help teachers know when they need to modify instruction. Formative assessments may indicate lesson concepts that are not clearly understood



or identify specific topics that students do not understand, which allows teachers to adjust their instructional plan accordingly. The Word Splash (Ur & Wright, 1989) example below illustrates how students' knowledge of new vocabulary from a lesson about the three types of cells can be formatively assessed.

- Write on the board new vocabulary words (*prokaryote, eukaryote, organelles, unicellular, multi-cellular, bacteria, flagellum*).
- Have student groups look at the words. After a minute or less, quickly erase one of the words.
- Tell the groups to write down the erased word. Inform the students that every student in each group must know which word was erased because you will call on the group members at random. Once everyone in a group has the same answer, everyone should raise their hands.
- Ask a student from the first group with raised hands to say the word, spell the word, and use it in a sentence. Tell the student to ask for assistance from the group if needed.
- Continue until all the words have been erased.

At the conclusion of a SIOP lesson, the teacher reviews the new vocabulary introduced and practiced in the lesson with the students and revisits the content and language objectives stated at the beginning. For example, the teacher might say, "Let's see if we met our content and language objectives for today." Then the class can assess whether the objectives were met and how.

## Conclusion

Processing academic language and understanding science concepts are cognitively demanding activities. English language learners need their attention drawn to key vocabulary and concepts in context so they can see the connections between the objectives of the lesson and the way the lesson was enacted. Emphasizing key vocabulary, creating opportunities for student-to-student interaction, and reminding students of the lesson objectives are some of the many ways that the SIOP Model can help students develop academic language proficiency and support learner autonomy in subjects with high language demands, such as science. To learn more about lesson preparation using the SIOP Model, see Echevarria, Vogt, & Short (2008).

## References

- August, D., & Shanahan, T. (Eds.). (2006). *Developing literacy in second-language learners: Report of the National Literacy Panel on Language-Minority Children and Youth*. Mahwah, NJ: Erlbaum.
- Baumann, J., Kame'enui, E., & Ash, G. (2003). Research on vocabulary instruction: Voltaire redux. In J. Flood, D. Lapp, J. Squire, & J. Jensen (Eds.), *Handbook of research on teaching the English language arts* (2nd ed., pp. 752-785). Mahwah, NJ: Erlbaum.
- California Department of Education. (2004). *Statewide Stanford 9 test results for reading: Number of students tested and percent scoring at or above the 50th percentile ranking*. Retrieved February 23, 2004, from <http://dq.cde.ca.gov/dataquest/>
- Echevarria, J., Short, D., & Powers, K. (2006). School reform and standards-based education: An instructional model for English language learners. *Journal of Educational Research*, 99(4), 195-210.
- Echevarria, J., Vogt, M., & Short, D. (2008). *Making content comprehensible for English learners: The SIOP model*. Boston: Pearson/Allyn & Bacon.
- Genesee, F., Lindholm-Leary, K., Saunders, W., & Christian, D. (2006). *Educating English language learners: A synthesis of research evidence*. New York: Cambridge University Press.
- Lee, J., Grigg, W., & Donahue, P. (2007). *The nation's report card: Reading 2007* (NCES 2007-496). Washington, DC: U.S. Government Printing Office.
- Nagy, W. E., & Scott, J. A. (2000). Vocabulary processes. In M. L. Kamil, P. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 269-284). Mahwah, NJ: Erlbaum.
- Short, D., Fidelman, C., & Louguit, M. (2009). *The effects of SIOP Model instruction on the academic language development of English language learners*. Manuscript submitted for publication.
- Siegel, H. (2002). Multiculturalism, universalism, and science education: In search of common ground. *Science Education*, 86, 803-820.
- Ur, P., & Wright, A. (1989). *Five-minute activities: A resource book of short activities*. Cambridge: Cambridge University Press.

The Center for Research on the Educational Achievement and Teaching of English Language Learners (CREATE) conducts a program of research designed to address specific challenges in the education of English language learners in Grades 4-8. CREATE is a partnership of researchers from six institutions:

- Texas Institute for Measurement, Evaluation, and Statistics, University of Houston
- California State University, Long Beach
- Center for Applied Linguistics
- Harvard University
- University of California-Berkeley
- Vaughn Gross Center, University of Texas at Austin

This brief was produced by CREATE with funding from the U.S. Department of Education (ED), Institute of Education Sciences, under Contract No. ED-R305A05056. The opinions expressed in this report do not necessarily reflect the positions or policies of ED. This document is in the public domain and may be reproduced without permission.

## Response to Intervention and English Learners

Jana Echevarria, California State University, Long Beach  
Jan Hasbrouck, Gibson Hasbrouck & Associates, Wellesley, MA

Guillermo has struggled since he enrolled in Lincoln School. He receives English as a second language (ESL) services, but general education teachers at Lincoln have had little or no professional development to help them understand second language acquisition and learn effective practices for working with English learners. Guillermo's teachers over the past 2 years thought he just needed more time to learn English, but Guillermo speaks English fairly well; it is in academic situations where he falters. His current teacher recognizes that English learners like Guillermo require instruction that takes into consideration the linguistic demands of academic tasks. She has been teaching in ways that make lessons more understandable to English learners, but she and the ESL teacher both agree that Guillermo hasn't been making adequate academic progress. In the past, she might have been tempted to consider a referral for special education services, but because her school has a well-developed Response to Intervention (RTI) process, she will tap into that source to get Guillermo the help he needs.

RTI is an instructional service delivery model founded on two key premises:

- All children can learn when provided with appropriate, effective instruction.
- Most academic difficulties can be prevented with early identification of need followed by immediate intervention.

RTI uses a multi-tiered structure of increasingly intensive and focused instruction and intervention for serving the needs of students with academic or behavioral concerns (see Figure 1). It is being seen as a more effective process than more traditional approaches, which involve either waiting for a student to fail before intervening or identifying a potential need for special education services, then testing, determining eligibility,

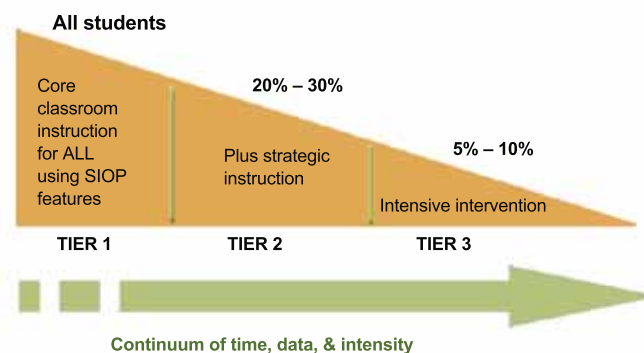


Figure 1. Response to intervention.

and placing the student. But for English learners—the fastest growing segment of the school population—the RTI process raises some special issues. Because English learners face the challenge of learning new material, skills, and information in a new language, teachers need to use practices that have been shown to be effective in making instruction understandable for them (August & Shanahan, 2006; Echevarria, Short, & Powers, 2006; Genesee, Lindholm-Leary, Saunders, & Christian, 2006; Goldenberg, 2008).

Like Guillermo, many English learners have floundered without appropriate assistance for a number of reasons, including low expectations for their academic performance (Artiles & Trent, 1994; McKown & Weinstein, 2007). In addition, because culturally diverse students have historically been both over- and under-represented in special education, some schools restrict referral for special education services or assessment until English learners have been in school for some period of time. They hope this will reduce the misidentification of English learners as having learning disabilities. Often, teachers assume that English learners' academic difficulties are related to language acquisition and give them additional time, ostensibly to learn English, before offering appropriate academic support.



In the past, when English learners didn't make adequate academic progress, one of the only options available to teachers was to refer the students for an assessment to identify possible learning disabilities. Now the RTI process is available as an alternative to the IQ–achievement discrepancy formula, which measures the gap between a student's potential and achievement (Fuchs, Fuchs, & Vaughn, 2008; National Center for Learning Disabilities, n.d.). This brief is designed for educators who are learning about or have begun the process of implementing RTI to help them tailor its use to meet the needs of English learners.

## **RTI Services**

The first step in following the RTI model is ensuring that general education instruction reflects best practice and meets the students' academic and linguistic needs. For English learners who struggle, we need to consider what instructional accommodations are necessary for them to succeed academically. RTI services are typically provided in one of two ways: a problem-solving procedure or a standard treatment protocol (Fuchs, Fuchs, & Vaughn, 2008; Haager, Klingner, & Vaughn, 2007). In the problem-solving procedure, decisions about the instructional adjustments or services to be provided for an individual student are based on results of assessments and observations and are tailored to the needs of the student. With the standard treatment protocol, the school has a specific set of programs or interventions available for use at various tiers of service (described below), and students with a specific profile of needs are placed in the most appropriate program. Schools often use a combination of the two approaches (Brown & Doolittle, 2008). Whichever approach schools take, educators with knowledge of second language acquisition and effective practices for English learners must be involved in the decision-making process.

### ***Tier 1: Standards-Based Instruction***

Tier 1 services involve providing effective, differentiated instruction in the general education classroom using whole-class and small-group formats. For English learners, this instruction is made comprehensible by having clear learning objectives and using a variety of techniques, such as presenting material visually, providing sufficient repetition, and offering opportunities to practice new learning.

The key to an effective RTI model is providing instruction in the general education classroom that is in accordance with students' needs. Teachers should

be provided with sufficient support (e.g., release time, shared planning periods) to allow collaboration within and across grade levels. This enables them to make decisions—based on standards, data from benchmark and diagnostic assessments, classroom observations, and language proficiency assessments—about what to teach in order to meet the specific needs of their students. Teachers then design and deliver lessons that utilize research-based components of systematic, explicit, intensive instruction with many opportunities for active student engagement. More specific instructional practices for English learners are described later in this brief.

### ***Tier 2: Supplemental Instruction***

If students are not responding as expected to Tier 1 instruction, as determined through progress monitoring assessments, work samples, and daily observations, they can be considered for Tier 2 services. Services provided at this level are intended to be supplemental—provided in addition to the continuing Tier 1 instruction—and closely aligned with the content and focus of the classroom instruction.

Tier 2 services are intended to be short-term. With this extra instruction, the desired outcome is that students will learn the skills they have been struggling with and can then benefit from Tier 1 instruction alone. Tier 2 services can be provided by classroom teachers themselves in small-group instruction, by specialists who work in the classroom or pull students out during the school day, in before- or after-school programs, or in Saturday school or summer school. Instruction for English learners might include intensive English language development, instruction with ample contextual clues to make it understandable, and/or specific literacy interventions (Haager, Klingner, & Vaughn, 2007; Linan-Thompson, Vaughn, Prater, & Cirino, 2006; Richards & Leafstedt, 2010). If students are not making sufficient progress with Tier 2 services, educators may consider Tier 3 services.

### ***Tier 3: Intensive Intervention***

In some RTI frameworks, Tier 3 includes special education services for students who have been formally identified as having a learning disability and have had an Individualized Education Plan developed for them. In other cases, schools design Tier 3 to be an intensive, focused intervention that may include students without disabilities. In some cases, Tier 3 is supplemental—provided in addition to Tier 1 and Tier 2 services. In other cases, particularly when the student's performance level is far

below grade-level expectations, Tier 3 may be provided as a replacement to core classroom instruction. Tier 3 instruction is more intensive than Tier 2 because it is provided in smaller groups and with a more specific skills focus. (Vaughn, Wanzek, Murray, Scammacca, Linan-Thompson, & Woodruff, 2009). Whatever the format, all interventions provided in Tier 3 must be research based (Klingner, Sorrells, & Barrera, in press).

## Assessments Used in RTI

RTI models involve administering assessments and using the results to make key academic decisions. *Benchmark* or *screening assessments* are used to identify students who are not meeting established performance benchmarks and may therefore need additional assistance. *Diagnostic assessments* can help pinpoint specific skills for which the student may need additional or specialized instruction. *Progress monitoring assessments* are often used with students receiving supplementary assistance or intensive intervention to help teachers determine whether the student is making adequate improvement in response to instruction. A fourth category of assessments, sometimes referred to as *outcomes assessments*, includes tests used to measure progress toward standards or broader objectives, such as annual state tests or standardized achievement tests.

Benchmark, screening, and progress monitoring assessments typically use curriculum-based measurement (CBM) procedures. Curriculum-based measures of oral reading fluency involve having students read aloud from unpracticed passages or lists of words for one minute and scoring the number of words read correctly. CBM has been established over the past decades as valid and reliable for screening decisions and for monitoring students' progress in reading (Wayman, Wallace, Wiley, Tichá, & Espin, 2007). While only a few published studies have addressed the use of curriculum-based reading measures with students who are not proficient English speakers (Wiley & Deno, 2005), those studies have found the reliability and validity for oral reading fluency to be the same for English learners and native English speakers (Baker & Good, 1995; Graves, Plasencia-Peinado, Deno, & Johnson, 2005). It is recommended that, whenever possible, initial screenings in early reading skills be conducted in both the student's native language and English to get an accurate assessment of skill development (Richards & Leafstedt, 2010). In all cases, the unique linguistic needs of English learners must be considered when selecting assessment methods and interpreting the results.

## Instructional Considerations for English Learners

When an RTI model is in place and assessments indicate that a student is not making sufficient progress in the general education classroom, the first consideration is to examine the quality of instruction that the student is receiving. Are research-based practices used consistently? How well does classroom instruction meet the student's specific needs? Effective instruction for English learners provides access to the core curriculum and, at the same time, intentionally develops their English language proficiency. Specific features of high-quality instruction include explicitly teaching the academic language required to complete the lesson's activities and assignments, activating and strengthening students' background knowledge, promoting oral interaction and extended academic talk, and reviewing vocabulary and content concepts to provide repetition of key ideas and their associated language (Echevarria & Short, 2009).

Many teachers are familiar with some strategies or techniques for making instruction understandable for English learners, such as using visuals, repeating key vocabulary, or slowing their speech. But teachers need a way to consistently and systematically implement best practices to provide optimal learning conditions for English learners. The Sheltered Instruction Observation Protocol (SIOP) Model provides a framework that is composed of research-based features of instruction, including the techniques previously mentioned (Echevarria, Vogt, & Short, 2008). The SIOP Model consists of 30 research-based features of instruction that, when implemented to a high degree, improve the achievement of English learners (Echevarria, Richards, Canges, & Francis, 2009; Echevarria, Short, & Powers, 2006; Short, Fidelman, & Louguit, 2009).

## Effective Practices for Teachers of English Learners

Before English learners are recommended for Tier 2 or Tier 3 services, teachers need to ensure that these students have had sufficient exposure to high-quality, appropriate teaching that includes academic English instruction in an environment that is supportive of their language development. The following practices are essential for providing meaningful, understandable lessons for students learning English.

### ***Pay Systematic Attention to Language Development***

When teachers have both a content objective and a language objective for their instruction, they remain cognizant of daily English language development. Standards for English language arts or English language development can be used to guide the selection of language objectives to increase students' proficiency in reading, writing, speaking, and listening.

Systematic attention to language development includes vocabulary knowledge, which has been found to relate strongly to students' reading comprehension and to their overall academic success (August & Shanahan, 2006; Baker, Simmons, & Kameenui, 1995; Lehr, Osborn, & Hiebert, 2004). For English learners, vocabulary development should be an intentional goal of every lesson. Teachers can present new terms in context, talk about them, encourage students to use them in conversation and peer dialogue, and post them for students to see and use.

### ***Build on Students' Background Experiences***

Although students come to school with a wealth of experiences, these experiences may not align with those reflected in texts and lessons. Teachers can tap into students' experiences and link them to the lesson by asking questions about the topic. For example, the teacher may ask, "Have you ever had to take care of a younger brother, sister, or cousin? Tell me about it," then "Well, today we're going to read about a boy who had to bring his little sister with him to his baseball game. How would you feel if that happened to you?" This type of discussion makes a link between students and the text. The same approach can be used with historical events, science concepts, and math word problems.

### ***Use Techniques That Make the Lesson More Understandable***

Provide visual clues for students by using gestures, modeling, pictures, demonstrations, and graphic organizers. Writing words on the board or overhead projector to accompany speech creates a context for understanding. Words and key lesson information should be posted in the classroom as a reference for later use.

Use scaffolding to provide students with the level of support they need to complete the task or assignment successfully. As students become more proficient, the amount of support provided decreases, until they can work independently. The gradual release of responsibility model explicitly moves instruction from the teacher ("I do it"), to guided instruction with the whole class

("We do it"), to students working together with teacher supervision ("You do it together"), and, finally, to students being responsible for their own work ("You do it alone") (Fisher & Frey, 2008).

### ***Create Opportunities for Practice and Application***

The gradual release of responsibility model provides students with ways to practice using new information and concepts. However, some students may need additional opportunities to practice new learning with continued support as they move through the process. Support may include hands-on activities that are meaningful and engaging, more teacher modeling or guided practice, scaffolding of tasks (e.g., providing partially completed graphic organizers or outlines for students to fill in), and explanations in the student's primary language.

English learners need structured opportunities in all subject areas for practice of academic English. These can be provided by creating balanced turn taking between teachers and students in class discussions and by having students work in small groups or with partners to discuss and grapple with ideas and information in the text. Opportunities for practice using academic English can advance learners' proficiency and improve their knowledge and use of English. There is a strong relationship between oral language proficiency and literacy (August & Shanahan, 2006), which makes development of oral language a priority.

### ***Use Repetition and Redundant Information***

Following the simple rule "Say it, show it, repeat it" ensures that students have multiple exposures to the information in a lesson and that they receive the information in a variety of ways. Teachers can provide extra support for English learners by using technology such as PowerPoint slides, overhead transparencies, smart boards, audiotaped texts, and Web sites as supplements to oral presentations.

### ***Assess Frequently and Reteach as Necessary***

The saying "practice makes perfect" is true only if the practice is accurate. Because there is much that may be misinterpreted by students who are learning in a new language, teachers of English learners need to check frequently for understanding and reteach when needed. Periodic review and practice are called for because English learners require repetition and redundancy. English learners improve their conceptual understanding and English proficiency with repeated exposure to learning.



## Summary

Research has shown that educators today have at their disposal the tools and strategies necessary to provide effective instruction to all students (August & Shanahan, 2006; Ellis & Worthington, 1994; Genesee et al., 2006; Marzano, Gaddy, & Dean, 2000). By using an RTI framework to guide their professional decisions, teachers can provide specialized supplementary instruction and intensive intervention to those students who need such additional assistance. With English learners, it is imperative to consider whether current classroom instruction reflects best practices for their specialized needs. When making these decisions, it is important to consider each child's particular set of life experiences and to work closely with families to identify relevant cultural influences and considerations (Brown & Doolittle, 2008).

## References

- Artiles, A., & Trent, S. (1994). Overrepresentation of minority students in special education: A continuing debate. *The Journal of Special Education*, 27(4), 410-437.
- August, D., & Shanahan, T. (Eds.). (2006). *Developing literacy in second-language learners: A report of the National Literacy Panel on Language-Minority Children and Youth*. Mahwah, NJ: Erlbaum.
- Baker, S. K., & Good, R. H. (1995). Curriculum-based measurement of English reading with bilingual Hispanic students: A validation study with second-grade students. *School Psychology Review*, 24, 561-578.
- Baker, S. K., Simmons, D., Kameenui, E. J. (1995). *Vocabulary acquisition: Curricular and instructional implications for diverse learners* (Tech. Rep. No. 14). Eugene, OR: National Center to Improve the Tools of Educators.
- Brown, J. E., & Doolittle, J. (2008). *A cultural, linguistic, and ecological framework for response to intervention with English language learners*. Tempe, AZ: National Center for Culturally Responsive Educational Systems. Retrieved May 21, 2009, from [http://www.nccrest.org/Briefs/Framework\\_for\\_RTI.pdf](http://www.nccrest.org/Briefs/Framework_for_RTI.pdf)
- Echevarria, J., Richards, C., Canges, R., & Francis, D. (2009). *The role of language in the acquisition of science concepts*. Manuscript submitted for publication.
- Echevarria, J., & Short, D. (2009). Programs and practices for effective sheltered content instruction. In D. Dolson & L. Burnham-Massey (Eds.), *Improving education for English learners: Research-based approaches*. Sacramento: California Department of Education Press.
- Echevarria, J., Short, D., & Powers, K. (2006). School reform and standards-based education: An instructional model for English language learners. *Journal of Educational Research*, 99(4), 195-210.
- Echevarria, J., Vogt, M. E., & Short, D. (2008). *Making content comprehensible for English language learners: The SIOP® Model* (3rd ed.). Boston: Allyn & Bacon.
- Ellis, E. S., & Worthington, L. A. (1994). *Research synthesis on effective teaching principles and the design of quality tools for educators* (Tech. Rep. No. 5). Eugene, OR: National Center to Improve the Tools of Educators.
- Fisher, D., & Frey, N. (2008). *Better learning through structured teaching*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Fuchs, D., Fuchs, L. S., & Vaughn, S. (2008). *Response to intervention: A framework for reading educators*. Newark, DE: International Reading Association.
- Genesee, F., Lindholm-Leary, K., Saunders, W., & Christian, D. (2006). *Educating English language learners: A synthesis of research evidence*. New York: Cambridge University Press.
- Goldenberg, C. (2008). Teaching English language learners: What the research does—and does not—say. *American Educator*, 12(2), 8-22.
- Graves, A. W., Plasencia-Peinado, J., Deno, S. L., & Johnson, J. R. (2005). Formatively evaluating the reading progress of first-grade English learners in multiple-language classrooms. *Remedial and Special Education*, 26(4), 215-225.
- Haager, D., Klingner, J., & Vaughn, S. (2007). *Evidence-based reading practices for response to intervention*. Baltimore, MD: Brookes.
- Klingner, J. K., Sorrells, A. M., & Barrera, M. (in press). *Three-tiered models with culturally and linguistically diverse students*. In D. Haager, S. Vaughn, & J. Klingner (Eds.), *Validated reading practices for three tiers of intervention*. Baltimore, MD: Brookes.
- Lehr, F., Osborn, J., & Hiebert, E. H. (2004). *A focus on vocabulary*. Honolulu, HI: Pacific Regional Educational Laboratory. Retrieved July 7, 2009, from [http://www.prel.org/products/re\\_/ES0419.pdf](http://www.prel.org/products/re_/ES0419.pdf)
- Linan-Thompson, S., Vaughn, S., Prater, K., & Cirino, P. (2006). The response to intervention of English language learners at risk for reading problems. *Journal of Learning Disabilities*, 39(5), 390-398.
- Marzano, R. J., Gaddy, B. B., & Dean, C. (2000). *What works in classroom instruction*. Aurora, CO: Mid-continent Research for Education and Learning.

- McKown, C., & Weinstein, R. (2007). Teacher expectations, classroom context and the achievement gap. *Journal of School Psychology, 46*(3), 235-261.
- National Center for Learning Disabilities. (n.d.). *RTI Action Network*. Retrieved May 22, 2009, from <http://www.rtinetwork.org>
- Richards, C., & Leafstedt, J. (2010). *Early reading interventions: Strategies and methods for struggling readers*. Boston: Pearson Allyn & Bacon.
- Short, D., Fidelman, C., & Louguit, M. (2009). *The effects of SIOP Model instruction on the academic language development of English language learners*. Manuscript submitted for publication.
- Vaughn, S., Wanzek, J., Murray, C. S., Scammacca, N., Linan-Thompson, S., & Woodruff, A. (2009). Response to early reading intervention: Examining higher and lower responders. *Exceptional Children, 75*(2), 165-183.
- Wayman, M. M., Wallace, T., Wiley, H. I., Tichá, R., & Espin, C. A. (2007). Literature synthesis on curriculum based measurement in reading. *Journal of Special Education, 41*(2), 85-120.
- Wiley, H. I., & Deno, S. L. (2005). Oral reading and maze measures as predictors of success for English learners on a state standards assessment. *Remedial and Special Education, 26*(4), 207-214.

---

## About CREATE

CREATE, the Center for Research on the Educational Achievement and Teaching of English Language Learners, is conducting a program of research designed to address the critical challenge of improving educational outcomes for English language learners in the middle grades by

- Enhancing the empirical research base for readers in Grades 4–8
- Using both narrative and expository text to develop and test effective interventions that promote content knowledge and language and literacy development
- Investigating the features of instruction and text modifications that facilitate learning for English learners (e.g., traditional instruction vs. ESL-enhanced instruction, teacher-guided instruction vs. group work, traditional text vs. modified text)
- Designing, testing, and delivering professional development that ensures that teachers implement effective classroom practices to help English learners achieve high standards

**For more information, visit the CREATE Web site**

**[www.cal.org/create](http://www.cal.org/create)**




---

The Center for Research on the Educational Achievement and Teaching of English Language Learners (CREATE) conducts a program of research designed to address specific challenges in the education of English language learners in Grades 4-8. CREATE is a partnership of researchers from six institutions:

- |  |  |
|--|--|
| • Texas Institute for Measurement, Evaluation, and Statistics, University of Houston | • Harvard University                                 |
| • California State University, Long Beach  | • University of California-Berkeley                  |
| • Center for Applied Linguistics   | • Vaughn Gross Center, University of Texas at Austin |

This brief was produced by CREATE with funding from the U.S. Department of Education (ED), Institute of Education Sciences, under Contract No. ED-R305A05056. The opinions expressed in this report do not necessarily reflect the positions or policies of ED. This document is in the public domain and may be reproduced without permission.

# Improving Science and Vocabulary Learning of English Language Learners

Diane August, Lauren Artzi, and Julie Mazrum, Center for Applied Linguistics

Current educational policy embodied by the No Child Left Behind Act requires that all students, including English language learners, meet high standards in science, reading, and math. While expectations for content area achievement are high, findings from the National Center for Education Statistics (n.d.) indicate that scores at all grade levels are considerably lower for English language learners than for their English-proficient peers. To help English language learners reach high standards in science when it is taught in their second language, it is crucial to build on prior research findings in designing and implementing science programs for these students.

This brief is a review of research on effective science instruction for English language learners, as well as on the role of English language proficiency, learning in a second language, and first language knowledge in science learning. We then briefly turn to findings from two intervention studies that were effective in building academic and discipline-specific vocabulary and science knowledge in English language learners. It is intended as an overview for researchers and educators.

## Research on Effective Science Instruction for English Language Learners<sup>1</sup>

Findings from experimental and pre-experimental studies provide some evidence that effective first language instruction, most notably inquiry-based learning, may be a good starting place but it is not sufficient to help English language learners learn science (Amaral, Garrison, & Klentschy, 2002; Cuevas, Lee, Hart, & Deaktor, 2005; Fradd, Lee, Sutman, & Saxton, 2002; Lee, Deaktor, Enders, & Lambert, 2008; Lee, Deaktor, Hart, Cuevas,

& Ender, 2005; Lee, Maerten-Rivera, Penfield, LeRoy, & Secada, 2008; Lynch, Kuipers, Pyke, & Szesze, 2005).

Lynch et al. (2005) examined the effect of a highly rated middle grades curriculum unit that was congruent with National Science Education Standards (National Research Council, 1996). The unit was “student-centered, hands-on, and phenomenon-based in which students explored four chemical reactions with increasing sophistication with the aim of helping them acquire a deep understanding of the target [science] standard/benchmark” (p. 921). No alterations for students’ language or cultural backgrounds were described by the authors. The findings indicate that students who had never received English for speakers of other languages (ESOL) services and students who had received but exited from these services significantly outperformed similar students in a control group who were not exposed to the intervention curriculum on measures of science achievement, basic learning engagement, and goal orientation. But students in the intervention group who were concurrently receiving ESOL services did not outperform similar students in the control group. Additionally, when researchers examined the growth in science knowledge of the three groups, they found that it was nearly flat for all students who were current recipients of ESOL services. This was not the case for the other two student groups, those who were no longer receiving ESOL or never had.

Interventions that build on effective first-language science teaching research but also take into account the language and cultural backgrounds of English language learners may be more promising. Studies by Lee et al. (2008a, 2008b), which were part of a five year professional development effort called Promoting Science

among English Language Learners (P-SELL), built on research in effective first-language science teaching and aimed at improving science and literacy achievement of English language learners in urban elementary schools. The intervention employed in these studies consisted of curriculum units (student booklets, teachers' guides, and science supplies) and professional development for instructors throughout the school year. The intervention attended to both the language and literacy needs of English language learners; for example, the student booklets included activities and strategies to strengthen students' reading and writing by using "specific comprehension questions about inquiry activities, strategies to enhance comprehension of science information in expository text at the end of each lesson, and [focus on] various language functions (e.g., describing, explaining, reporting, drawing conclusions 'in the context of science inquiry')" (Lee et al., 2008b, p. 38). Language needs were also addressed by teaching and reinforcing key vocabulary and using "multiple modes of communication and representation (e.g., verbal, gestural, written, and graphic) to enhance students' understanding" (Lee et al., 2008b, p. 38). The lessons drew on students' culture by providing science terms in Spanish and Haitian Creole. Professional development focused on science and math content as well as language and literacy development. Findings indicated significant pre- to posttest gains in science achievement for students in a treatment group that included current ESOL students, students exited within 2 years from ESOL, and students who had never been in ESOL or had been exited from ESOL for more than 2 years. Students currently in ESOL and students who had exited from ESOL or never been in ESOL showed comparable gains from pretest to posttest, suggesting that the intervention was not differentially effective for subgroups of students based on their status of participating in ESOL. The authors attribute the promising results of the intervention<sup>2</sup> in part to the integrated approach to professional development that addressed English language learners' "learning needs in English and the content areas simultaneously" (Lee et al., 2008b, p. 49), as well as to providing teachers with the supplies they needed to carry out the intervention and ensuring that schools actually provided dedicated time for science instruction.

An array of research focused on science instruction for English language learners helped inform the intervention studies that are the subject of this brief and discussed in later sections. (Amaral et al., 2002; Cuevas et al., 2005; Fradd et al., 2002; Lee et al., 2005). For

example, in one study (Fradd et al., 2002), each lesson emphasized a specific language function (e.g., describing, explaining), focused on vocabulary development, and allowed English language learners to use a variety of representational formats to communicate science knowledge. In a second study (Amaral et al., 2002), while most of the science instruction was in English (even in the bilingual arm of the study), teachers had the freedom to use Spanish for facilitation of instruction, including the use of support materials written in Spanish.

## **The Roles of English Language Proficiency, Learning in a Second Language, and First Language Knowledge in Science Learning**

Studies that examined the relationship between levels of English proficiency and science learning have consistently found that limited English proficiency inhibited students' science achievement when learning was in English (e.g., Curtis & Millar, 1988; Tobin & McRobbie, 1996; Torres & Zeidler, 2002). These studies support the premise that it is important to scaffold science instruction so that it is more comprehensible for English language learners.

Studies that investigated the role of classroom discourse and other forms of scaffolding describe how teachers mediate between students' current English abilities and levels of science understanding and the more academic English and science knowledge being targeted (Gibbons, 2003; Parkinson, Jackson, Kirkwood, & Padayachee, 2007; Young & Nguyen, 2002). For example, in one study, teachers mediated language learning in several ways—mode shifting through recasting (e.g., the teacher recapping a student's contribution to fit the broader pedagogic objectives of the curriculum), signaling to learners how to reformulate their talk (e.g., indicating a need for clarification, giving the student an opportunity for self-correction, supplying a recoded version), and recontextualizing students' expressions of personal learning (e.g., helping students use the appropriate register and more specificity in their explanations [Gibbons, 2003]).

Finally, studies have indicated that when an English language learner's first language shares cognates with English, first language knowledge can be helpful in science learning in English. Bravo, Hiebert, and Pearson (2007) found that approximately 88% of key science words selected for instruction were cognates in Span-



ish, and about half of them were high-frequency words in Spanish, making them more likely to be known by Spanish speakers, including those who had not had high levels of schooling in their first language. Previous research has indicated that from Grades 4 to 8, student recognition of cognates increases rapidly (Hancin-Bhatt & Nagy, 1994) and that older students are able to transfer cognate knowledge from their first to their second language (Durgunoglu, Nagy, & Hancin-Bhatt, 1993; Jimenez, García, & Pearson, 1996).

In sum, the literature indicates that promising instructional approaches build on what is known from first-language science knowledge and also take into account the language and cultural backgrounds of the students. Examples include using activities and strategies to enhance comprehension of science information (e.g., interactive questioning on expository text); focusing on language functions (e.g., describing, explaining, reporting, drawing conclusions in the context of science inquiry); explicitly teaching and reinforcing key vocabulary; and strategically using students' first language to enhance their understanding.

## CREATE Intervention Studies

Two science interventions were conducted under the auspices of CREATE. An overriding principle in our research was to make science instruction effective for both English language learners and English-proficient students because these two groups of students are often placed in the same classrooms in the middle grades. Thus, the interventions we studied used as a starting point what we know about high-quality science instruction for students in the middle grades. We also drew on research about the role of English language proficiency, learning in a second language, and knowledge acquired in the first language (in this case Spanish) to tailor the interventions to meet the language and literacy needs of English language learners.

### Intervention A

The first intervention was conducted in a district with a high percentage of Latino English language learners in the Rio Grande Valley of Texas. It was implemented in 18 schools by 30 teachers who participated in professional development before and during the project. Mentors worked with teachers to help ensure that the curriculum was implemented as intended. The intervention was focused on developing third and fourth graders' academic language associated with ESL science lessons. The intervention consisted of a 60-minute, language

arts add-on segment to a summer school science enrichment program that used the Full Option Science System (FOSS) materials. FOSS is a research-based science curriculum for Grades K–8 developed at the University of California at Berkeley. The FOSS program was created to engage students in actively constructing ideas through their own inquiries, investigations, and analyses as they explore the natural world, with the goal of helping them appreciate the scientific process, learn important concepts, and develop the ability to think critically.

Methods to develop students' general academic and discipline-specific vocabulary during the language arts segment included pre- and postteaching of vocabulary using visuals; prereading activities that consisted of a picture walk and a "hook" question addressing the central concept of the FOSS science lesson; and shared interactive reading, in which students and teachers discussed text written by the investigators to reinforce the science concepts taught during the FOSS lesson and students answered questions that required them to use the targeted vocabulary. Glossaries, concept maps, and review games were used to reinforce the targeted vocabulary.

At the beginning of each lesson, the teacher taught key words from the passage to be read during the lesson. To introduce each word, the teacher used a vocabulary card showing two pictures to demonstrate the word. Definitions for the target words were provided in both English and Spanish, and students were taught to draw on their cognate knowledge. Additionally, teachers explained how the picture demonstrated the concept being taught. Below is an excerpt from the vocabulary instruction to prepare students for reading a passage about magnets.

First, the teacher showed the front of the card (Figure 1). Then the teacher said the following:

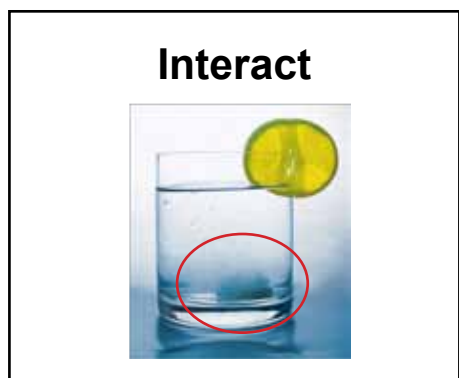
1. *A word in the text is interact. When two things interact, they have an effect on, or change, each other.*
2. *En español "interact" quiere decir interactuar. Cuando dos cosas interactúan, tienen un efecto sobre, o causan un cambio hacia, cada cosa.*
3. *Interact in English and interactuar in Spanish are cognates.*
4. *Now, let's look at a picture that demonstrates the word interact. When these two liquids [point to the green and the red liquids in the bottom pictures] are mixed together, they interact with each other. Their colors will change, and they will also produce bubbles [point to the top picture].*





**Figure 1. Vocabulary card, side 1.**

Next, the teacher showed the reverse side of the card (Figure 2), which included a second picture of the concept, and asked students to turn to a partner and explain how the new picture demonstrated the word's meaning.



**Figure 2. Vocabulary card, side 2.**

After the teacher taught the vocabulary words, she engaged the students in interactive reading (Figure 3). She first posed a “hook” question for students to keep in mind as they listened to the passage being read. Then she led students in a picture walk of a passage in the FOSS materials by pointing to the pictures in the text and discussing them with the students. After the picture walk, the teacher read the passage out loud while the students followed along in their student readers (key words that had been taught prior to the reading were highlighted). During the read-aloud the teacher would

use ESL scaffolding techniques (these were not scripted, but had been taught to teachers prior to the intervention) to make the meaning of the passage clear. Techniques included pointing to pictures or gesturing while reading, as well as paraphrasing sections of the text likely to be challenging for English learners. Students were asked questions about the text as they listened and/or read along with the teacher. Next, students reviewed the vocabulary words using a student glossary (Figure 4). Later in the week, students completed a graphic organizer that helped them synthesize the concepts they learned while reading the entire passage.

#### **Hook Question**

Ask students the “hook” question and discuss their answers briefly. Note, that students do not yet know the answer.

“Hook” question: What kinds of materials do magnets attract? What kinds of materials do magnets repel, or push away?

**Lodestone** is found in many parts of the world, including the United States. **Lodestone** is a natural magnet. Like all magnets, it **attracts** objects made of iron or other metals like steel that are made from iron.

However, magnets' attraction to some metals is not the only special thing about them. Another interesting thing is how magnets **interact**, or work with each other. Have you ever had a chance to play with little wooden trains that hook together with magnets? Because if you have, you would know that some of the magnets stick together just fine, but some push each other apart!

**Q:** It is quite **normal** or usual to think of magnets as attracting or pulling metal or other magnets to them. But what's another way magnets **interact**, or behave with each other? [Anticipated response: Magnets also repel one another, or push one another away.]




Magnet



Lodestone

**Figure 3. Interactive reading.**

Results show that students, all of whom were English language learners in this particular study, performed significantly better on the posttest with vocabulary that they had been explicitly taught using intervention methods than on vocabulary they were exposed to, but not explicitly taught.

<b>Interact</b>	<p>When two things <u>interact</u>, they have an effect on or change each other.</p> <p>When these two liquids are mixed together, they will <u>interact</u> with each other.</p> <p><b>Your sentence:</b> Chocolate powder will <u>interact</u> with hot milk and together they will make _____.</p>	
-----------------	---	---

**Figure 4. Student glossary (intervention A).**

### **Intervention B**

The second intervention was part of Quality English and Science Teaching (QuEST), a CREATE project designed to develop the science knowledge and academic language of English language learners and their English-proficient classmates in the middle grades. Ten sixth-grade science teachers in five middle schools in the Rio Grande Valley of Texas participated in the study. The sample included 890 students; 562 were English language learners and 328 were English proficient.

The intervention built on the district curriculum, which used Prentice Hall textbooks and workbooks, as well as district-developed labs that were aligned with the textbook content. The intervention consisted of two components that were not part of the district's curriculum: instructional materials following the principles of the Five E model of science instruction and professional development to help teachers in using the instructional materials. The Five E model, a highly rated inquiry approach to teaching science to monolingual English speakers, was developed by the Biological Science Curriculum Study (BSCS)<sup>3</sup>. The Five E model of learning consists of activities designed to engage, explore, explain, extend, and evaluate. The curriculum also called for direct instruction of both general and discipline-specific vocabulary. Definitions of the vocabulary were provided in students' first and second languages, and students were taught to draw on cognate knowledge.

The QuEST intervention required that teachers use scaffolding techniques shown to foster English language learners' understanding of academic content (August & Shanahan, 2008). Visuals were consistently used in science lessons, including illustrations of vocabulary concepts and graphic organizers. Students were given a preview of the experiments they would conduct to ensure that they understood the goals and procedures. Teachers were shown how to engage in instructional

conversations during science tasks and while reading the textbook. This involved lessons based in discussion and "geared toward creating opportunities for students' conceptual and linguistic development. The teacher encourages expression of students' own ideas, builds upon information students provide and experiences they have had, and guides students to increasingly sophisticated levels of understanding" (Goldenberg, 1991, p. 2). Thus, instructional conversations supported development of students' conceptual knowledge and oral proficiency. Teachers were encouraged to have students with very limited English proficiency respond in their first language and to interpret or have a classmate interpret their responses into English.

For example, in a lesson on the concept of osmosis, the teacher had the students engage in an introduction activity in which they observed the process of osmosis with a tea bag and water. For each activity, students were given a chart containing instructions and on which they could record relevant information and answer related questions. Figure 5 is an excerpt from the teacher's guide for the activity. It is important to note that teachers used the guide to prepare for the lesson. While teaching the lesson, the teachers used teacher charts that included a brief summary of tasks used in the lesson. The students also used charts to record observations at 30 seconds, 1 minute, and 1 minute and 30 seconds. At the end of the lesson, students reviewed the concepts by completing the student glossary. Figure 6 is an excerpt from the glossary. At the end of each week, students had an opportunity to synthesize what they had learned by completing a concept map that relates the concepts of diffusion and osmosis to the more general concept of cell transport (Figure 7).

Posttest results of students who had received the intervention showed statistically significant improvement over those who had not received it for both science knowledge and vocabulary.

## Conclusion

Both CREATE interventions were effective in developing the academic vocabulary of English learners. Intervention B, the QuEST intervention, which had an additional focus on building science content knowledge, was successful in accomplishing this goal (August, Branum-Martin, Hagan, & Francis, 2009). This research makes an important contribution by demonstrating that combining good science teaching with scaffolding and a focus on language development is an effective method for helping English language learners in science classrooms.

## Acknowledgements

The work reported here was supported by Grant Number R305A050056 from the Institute of Education Sciences, U.S. Department of Education to the University of Houston. The contents do not necessarily represent the positions or policies of these agencies, and readers should not assume endorsement of these positions by the federal government.

## Notes

<sup>1</sup>This section and the following are adapted from August et al. (2009).

<sup>2</sup>In follow-up work with fifth graders, there were significant differences in favor of the treatment group on the Florida Science test. It should be noted that this analysis did not control for initial levels of science achievement because such a measure was not available for students in the comparison schools (O. Lee, personal communication, December 23, 2008). Additionally, when compared with control students, the treatment-group students showed higher scores on the measurement strand of a statewide math assessment. While all demographic groups of students (including English language learners) in the treatment group consistently performed better than their counterparts on the measurement strand of the Florida Math test, the difference was not statistically significant.

<sup>3</sup>BSCS is a nonprofit corporation that endeavors to improve all students' understanding of science and technology by developing exemplary curricular materials, supporting their widespread and effective use, providing professional development, and conducting research and evaluation studies.

### Activity Overview: Students review and apply the concepts of diffusion and osmosis.

- Students work in pairs for this activity.
- Direct students to Student Chart 10.3A.
- Walk around and fill the students' Styrofoam cups  $\frac{3}{4}$  full of drinking water from the pitcher.
- Tell students: You will be placing a tea bag into the cup and will record your observations of what the water looks like at specified times. Both members of the pair will record observations at 0 seconds. As we are timing, each member of the pair takes turns writing observations, allowing a little more time for recording. So, at 30 seconds, one member will record the observations, and at the next interval, 1 minute, the other member will record the observations. Members of the pair will switch back and forth until our final recording at 5 minutes. I will let you know when to record your observations.
- Tell students: So, now record your observations of the water in the space for 0 seconds.
- Give students a moment to do this.
- Begin timing. At 30 seconds, tell students: Member 1 should record observations now.
- At 1 minute, tell students: Member 2 should record observations now.
- Continue this pattern for 1.5 minutes, 2 minutes, 2.5 minutes, 3 minutes, 3.5 minutes, 4 minutes, 4.5 minutes and the final observation at 5 minutes.
- After the final observation have students discuss the following with their partner. Tell students: In your pairs, come up with a scientific explanation for what has occurred with the tea bag and water using the concepts of osmosis and diffusion. Record your responses in Student Chart 10.3A. [Anticipated response: The water flows by osmosis through the tea bag. The proof of this is when one picks up the tea bag and squeezes it; the water comes out of the tea bag. The tea leaves diffuse through the tea bag into the water. As a result, the color and flavor of the water changes.]
- Students may drink the tea when they are done recording data. Have a few extra cups for pairs to share.

Figure 5. Excerpt of activity in teacher's guide.

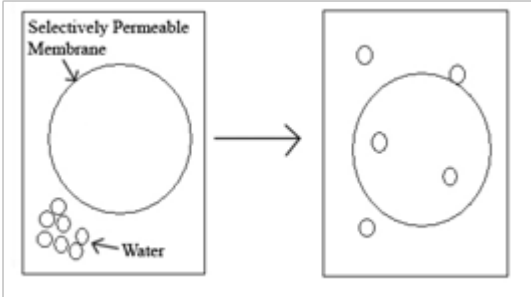
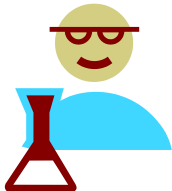
<p>osmosis</p>	<p>Osmosis is the process where water molecules move in and out of cells.</p> <p><i>En español “osmosis” es igual que en inglés, osmosis. Osmosis es el proceso a través del cual el agua se mueve dentro y fuera de las células. Osmosis es difusión, pero con agua.</i></p> <p>The two pictures on the right illustrate osmosis.</p> <p>Your notes:</p> <hr/> <hr/> <hr/>	
----------------	---	--

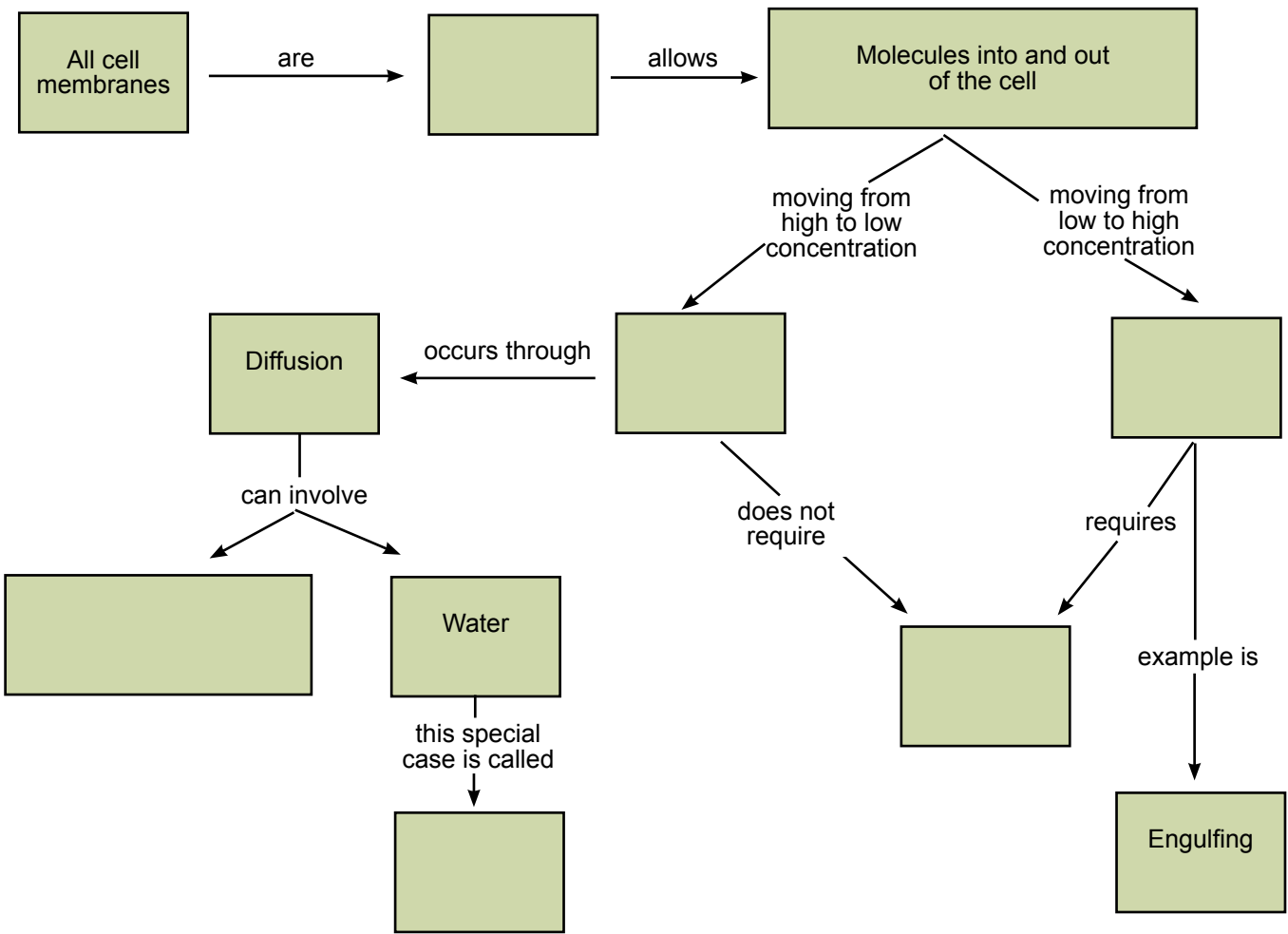
Figure 6. Student glossary (intervention B).



**Student Chart**  
Concept Map Practice

**Title:** Cell Transport  
**Word Bank:** SELECTIVELY PERMEABLE, PASSIVE TRANSPORT, ENERGY, ACTIVE TRANSPORT, OSMOSIS, SUBSTANCES OTHER THAN WATER

Use the word bank to fill in the blank squares in the concept map about cell transport.



```

graph TD
    A[All cell membranes] -- are --> B[ ]
    B -- allows --> C[Molecules into and out of the cell]
    C -- "moving from high to low concentration" --> D[Diffusion]
    C -- "moving from low to high concentration" --> E[ ]
    D -- "occurs through" --> F[ ]
    D -- "can involve" --> G[ ]
    D -- "can involve" --> H[Water]
    H -- "this special case is called" --> I[ ]
    E -- "does not require" --> J[ ]
    E -- "requires" --> K[ ]
    K -- "example is" --> L[Engulfing]
  
```

Figure 7. Concept map.

## References

- Amaral, O. M., Garrison, L., & Klentschy, M. (2002). Helping English learners increase achievement through inquiry-based science instruction. *Bilingual Research Journal*, 26(2), 213-239.
- August, D., Branum-Martin, L., Hagan, E., & Francis, D. (2009). The impact of an instructional intervention on the science and language learning of middle grade English language learners. *Journal of Research on Educational Effectiveness*, 2, 345-376.
- August, D., & Shanahan, T. (Eds.). (2008). *Developing reading and writing in second-language learners*. New York: Routledge.
- Cuevas, P., Lee, O., Hart, J., & Deaktor, R. (2005). Improving science inquiry with elementary students of diverse backgrounds. *Journal of Research in Science Teaching*, 42(3), 337-357.
- Curtis, S., & Millar, R. (1988). Language and conceptual understanding in science: A comparison of English- and Asian-language-speaking children. *Research in Science and Technological Education*, 6(1), 61-77.
- Durgunoglu, A. Y., Nagy, W. E., & Hancin-Bhatt, B. J. (1993). Cross-language transfer of phonological awareness. *Journal of Educational Psychology*, 85, 453-465.
- Fradd, S. H., Lee, O., Sutman, F. X., & Saxton, M. K. (2002). Materials development promoting science inquiry with English language learners: A case study. *Bilingual Research Journal*, 25, 479-501.
- Gibbons, P. (2003). Mediating language learning: Teacher interactions with ESL students in a content-based classroom. *TESOL Quarterly*, 37(2), 247-273.
- Goldenberg, C. (1991). *Instructional conversations and their classroom applications* (NCRCDSSL Educational Practice Reports, Paper EPR02). Center for Research on Education, Diversity & Excellence. Retrieved from <http://repositories.cdlib.org/crede/ncrcdssleducational/EPR02>
- Hancin-Bhatt, B., & Nagy, W. E. (1994). Lexical transfer and second language morphological development. *Applied Psycholinguistics*, 15(3), 289-310.
- Jimenez, R. T., García, G. E., & Pearson, D. P. (1996). The reading strategies of bilingual Latina/o students who are successful English readers: Opportunities and obstacles. *Reading Research Quarterly*, 31(1), 90-112.
- Lee, O., Deaktor, R., Enders, C., & Lambert, J. (2008a). Impact of a multi-year professional development intervention on science achievement of culturally and linguistically diverse elementary students. *Journal of Research in Science Teaching*, 45(6), 726-747.
- Lee, O., Deaktor, R. A., Hart, J. E., Cuevas, P., & Enders, C. (2005). An instructional intervention's impact on the science and literacy achievement of culturally and linguistically diverse elementary students. *Journal of Research in Science Teaching*, 42, 857-887.
- Lee, O., Maerten-Rivera, J., Penfield, R., LeRoy, K., & Secada, W. G. (2008b). Science achievement of English language learners in urban elementary schools: Results of a first-year professional development intervention. *Journal of Research in Science Teaching*, 45(1), 31-52.
- Lynch, S., Kuipers, J., Pyke, C., & Szesze, M. (2005). Examining the effects of a highly rated science curriculum unit on diverse students: Results from a planning grant. *Journal of Research in Science Teaching*, 42, 921-946.
- National Center for Education Statistics. (n.d.). *National Assessment of Educational Progress*. Retrieved from [http://nationsreportcard.gov/science\\_2005/s0115.asp?tab\\_id=tab2&subtab\\_id=Tab\\_1&printver=#chart](http://nationsreportcard.gov/science_2005/s0115.asp?tab_id=tab2&subtab_id=Tab_1&printver=#chart)
- National Research Council. (1996). *National science education standards*. Washington, DC: National Academy Press.
- Parkinson, J., Jackson, L., Kirkwood, T., & Padayachee, V. (2007). A scaffolded reading and writing course for foundation level science students. *English for Specific Purposes*, 26, 443-461.
- Tobin, K., & McRobbie, C. J. (1996). Cultural myths as constraints to the enacted science curriculum. *Science Education*, 80, 223-241.
- Torres, H. N., & Zeidler, D. L. (2002). The effects of English language proficiency and scientific reasoning skills on the acquisition of science content knowledge by Hispanic English language learners and native English language speaking students. *Electronic Journal of Science Education*, 6(3).
- Young, R. F., & Nguyen, H. T. (2002). Modes of meaning in high school science. *Applied Linguistics*, 23(3), 348-372.

---

The Center for Research on the Educational Achievement and Teaching of English Language Learners (CREATE) conducts a program of research designed to address specific challenges in the education of English language learners in Grades 4-8. CREATE is a partnership of researchers from six institutions:

- Texas Institute for Measurement, Evaluation, and Statistics, University of Houston
- Harvard University
- California State University, Long Beach
- University of California-Berkeley
- Center for Applied Linguistics
- Vaughn Gross Center, University of Texas at Austin

This brief was produced by CREATE with funding from the U.S. Department of Education (ED), Institute of Education Sciences, under Contract No. ED-R305A05056. The opinions expressed in this report do not necessarily reflect the positions or policies of ED. This document is in the public domain and may be reproduced without permission.



# Effective Social Studies Instruction to Promote Knowledge Acquisition and Vocabulary Learning of English Language Learners in the Middle Grades

Colleen Klein Reutebuch, The University of Texas at Austin

Many students learning English as a second language in the United States must study and be tested on grade-level curricula in a language that they are still learning. This is especially taxing for English language learners who are entering U.S. schools at the secondary level, because they have less time to meet accountability standards than do the English language learners entering the school system at the elementary level. Adolescent English language learners may struggle with academic text, lack of content area knowledge, and underdeveloped oral language and vocabulary levels that can hamper their academic achievement and place them at risk of educational failure in content area classes (Francis, Rivera, Lesaux, Kieffer, & Rivera, 2006). If the literacy and language development of struggling adolescent English language learners were targeted and supported by all content area teachers, there would be a greater hope for overall academic success.

## Research Focused on Middle School English Language Learners

The research base on effective instruction for adolescent English language learners' literacy development is limited (Short & Fitzsimmons, 2007). Fortunately, however, more than 30 years of research on reading has identified effective instructional practices that serve as the foundation for teaching all learners (i.e., strategy instruction; direct, explicit teaching of vocabulary and comprehension; use of graphic organizers; active engagement; multiple practice opportunities with corrective feedback; peer pairing) (Biancarosa & Snow, 2006; Francis et al., 2006; National Reading Panel, 2000; RAND Reading Group, 2002). Research on literacy in monolingual adolescents

does not fully generalize to English language learners, but it is relevant. Some monolingual, English-speaking adolescents also struggle with literacy and weaknesses in academic language and vocabulary, just as English language learners do (Torgesen et al., 2007). Still lacking, however, is valid and reliable research on effective instructional practices regarding vocabulary development and reading comprehension related to adolescent English learners' content knowledge, as well as effective methods for delivering instructions to English language learners in content area classes.

Recent efforts to improve the academic achievement of English language learners in Grades 4–8 address the limited knowledge base (Foorman & Hedges, 2009). One such effort includes ongoing research and refinement of a multicomponent intervention by the Center for Research on the Education and Teaching of English Learners (CREATE) to enhance social studies instruction in the middle grades by incorporating literacy instruction.

## CREATE Enhanced Social Studies Lessons

The instructional practices in the CREATE enhanced social studies lessons were designed to improve students' understanding of social studies content and expository text by giving all students opportunities to learn and use the vocabulary, concepts, big ideas, and issues associated with social studies units.

Lessons revolve around one or two central ideas that serve as organizing concepts to help the teacher focus the events and ideas in each unit. Every lesson is organized

similarly to encourage teachers to establish and adhere to instructional routines in order to eliminate the confusion that varying lesson structure and teacher directions can cause. Lesson plans identify the core subject matter and the main ideas that students need to learn and provide guidance to teachers on the use of specific instructional practices to convey the subject matter.

Units of study consist of 5 individual lessons designed to be delivered 1 per day during a 45- to 50-minute period over 5 days, with the 5th day designated for unit review, reteaching as necessary, and progress monitoring. Lessons 1–4 consist of the following elements:

- Presentation and review of content and language objectives
- Brief overview of the “big idea”
- Explicit vocabulary instruction that integrates paired students’ discussion of the words’ meanings both in context and in more relevant ways to students’ lives
- Discussion built around a 2- to 4-minute video clip that complements the daily reading
- Assigned reading (teacher-led or conducted in pairs) followed by students’ generating and answering questions in order to target comprehension
- Wrap-up activity in the form of a graphic organizer or writing exercise that serves to review and assess student learning

The fifth lesson in each unit prepares students for an end-of-the-week assessment. The teacher reviews the concepts and vocabulary that were covered during the week through a *Jeopardy*-style format in which the class is divided into teams that work cooperatively to answer questions. Students have time to revisit and review their notes from the past week, ask clarifying questions, participate in a whole-class review, and individually complete a short quiz consisting of ten vocabulary-matching items and five short-answer comprehension questions.

All of the lessons in the intervention include instructions to incorporate paired reading, paired writing, and paired vocabulary discussion. Pairing students to read and work cooperatively provides an interactive and motivating structure for peer-assisted learning, which fosters active engagement and provides many opportunities for students to give and receive immediate feedback. To pair students, the teacher ranks English monolingual students and English learners separately and according to reading and language ability. The teacher

then assigns each student a partner: the highest ranked English learner is paired with the highest ranked monolingual student, then the next highest ranked students from each group are paired, and so on, until all students have a partner. If executed with accommodations for individual student needs in mind, this arrangement ensures that English learners are adequately supported as they work on activities and discuss ideas.

### Presentation and Review of Content and Language Objectives

In keeping with best practices prescribed in the SIOP Model for teaching English language learners (Echevarría, Vogt, & Short, 2010), each lesson in the intervention includes measurable content and language objectives. Content objectives outline what students will learn and be able to do regarding the social studies topic. Language objectives address the aspects of academic language that will be developed or strengthened. Both content and language objectives are conveyed in language that students can understand. Teachers are directed to begin a lesson by reading the objectives aloud and posting them in class (Figure 1). Teachers should also review the objectives at the conclusion of a lesson to involve students in determining whether or not they were met.

### Overview of Main Idea and Vocabulary Instruction

Following the presentation of the objectives, teachers present an overview of the day’s lesson and connect it with information that has been taught previously. For example, a teacher may begin the overview in the following way:

The Texas Revolution, Part 1	
Big idea: What were the people involved in the Texas Revolution fighting for? Was their cause just?	
Objectives	Key vocabulary
<p>CONTENT—Students will:</p> <ul style="list-style-type: none"> <li>• Learn about the importance of the two battles in propelling the Texas Revolution.</li> </ul> <p>LANGUAGE—Students will:</p> <ul style="list-style-type: none"> <li>• Use key vocabulary in reading, writing, listening and speaking throughout the lesson.</li> <li>• Listen to and/or read the lesson passage, and write question responses in their notebooks.</li> <li>• In the review/assessment activity, discuss and write how the actions of the people involved in the war pushed forward the revolution.</li> </ul>	<p>artillery conflict reinforcements siege</p>

Figure 1. Content and language objectives.

As we have discussed, the Texas Revolution was looming as Texans, both Anglo and Mexican, refused to accept the governmental changes made by Santa Anna and the Mexican national government.

Today we will review some of the governmental changes and how they contributed to the beginning of the Texas Revolution. Later in the week, we will talk about specific battles of the Revolution and the people who were involved.

We should keep in mind who was fighting in this war and what they were fighting for. However, today we will focus on the events that led up to the Revolution.

Next, teachers explicitly teach three or four new, preselected vocabulary words that are drawn from readings, video clips, and a district- or state-level scope and sequence. These are words that are necessary to teach because of their potential for greater impact on students' reading comprehension (i.e., words that are rare or not very familiar). Teachers display each vocabulary word together with a picture that demonstrates the word (Figure 2) and directly teaches each of the vocabulary terms by adhering to the sequence of steps below:

1. Display concept/vocabulary transparency.
2. Pronounce the word, and give the cognate or translation in the first language of the English learners.
3. Provide a definition of the word that students are likely to understand.
4. Ask or tell students how the illustration or visual in the transparency is representative of the word.
5. Provide an example of the word in two sentences—one showing a historical context and the other in a context that is more relevant to students' experiences.
6. Use turn-and-talk prompts to help students make connections between the unit of study and what they know.
7. Give students opportunities to encounter and use the word repeatedly throughout instruction.

### Strategic Use of Video

A teacher can use a brief video segment to accompany a reading in order to help students develop their understanding of the lesson's big idea, as well as to provide English language learners with background knowledge on an unfamiliar topic (Gersten, Baker, Johnson, Dimino, & Peterson, 2006). The purposeful use of media serves to anchor instruction in context and to help students become engaged. The use of video also helps generate discussion, which in turn supports students' active

## conflict (conflicto)

**A serious, long-lasting disagreement or argument**



### Synonyms: disagreement, dispute

The **conflict** between the Texas settlers and the Mexican government caused several wars.

A **conflict** between the football coach and the referee led to a fight between the two schools.

### Turn and Talk

- What might have caused the conflict between the coach and the referee?
- How is a conflict different from or similar to a revolt?

*Figure 2.* Vocabulary transparency.

involvement in learning the content. Steps for incorporating media include the following:

1. Introduce the video clip either before students have read a textbook passage or before they have begun the supplemental reading that supports (i.e., explains, describes, reiterates) the big idea of the lesson. For instance, the teacher may say, "Now you're going to watch a video about the Battle of the Alamo, the most well-known battle of the Texas Revolution. Later we will read about it. The Texans could have surrendered when the siege began, but instead, they were inspired by their loss to continue to fight against Santa Anna and his Mexican forces."
2. Preview the video and set the purpose for viewing. For example, the teacher may say, "In this



clip, you will watch the Texans surrounded inside the Alamo as they discuss whether to surrender, attempt to escape, or stay and fight. Watch and listen in order to answer the question, ‘What led to the Mexican Army’s victory over the Texans at the Alamo?’”

3. Play the video clip and direct the students to record answers to the video question in their notes. Once students have recorded individual responses, they may compare and discuss their answers in pairs.
4. Conduct a brief discussion about the video. Here the teacher can summarize the clip and highlight the question posed by sharing a few responses from the students. For example, the teacher might say, “From today’s clip we see that the Mexican soldiers had encircled the Alamo. Let’s talk about the factors leading to the Mexican’s Army’s victory over the Texans. Group 1 recorded that the Mexican Army had surprised the Texans while they were sleeping. Group 3 indicated that the Mexican Army had surrounded the Alamo with a trench and cannons. Do you agree that those were contributing factors?”

### **Teacher-Led or Paired Student Reading**

The next step in every lesson involves a reading activity. The lesson design alternates so that on some days the teacher does a whole-group read-aloud and on others students work in pairs to read aloud from carefully selected text. Before every reading, the teacher asks the students to think about two or three questions that typically require that they focus on the most important ideas of the lesson. Students are responsible for answering those focus questions after reading the assigned text.

In teacher-led reading, the teacher uses scaffolding techniques to foster English language learners’ understanding of academic content and to support their language and literacy development (August & Shanahan, 2008). When the teacher reads aloud, he or she models fluent reading while clarifying vocabulary and periodically checking for students’ comprehension. In doing so, the teacher demonstrates think-alouds as a strategy for engaging in and making sense of text. The steps for teacher implementation are the following:

1. Preview the reading by asking questions to help activate background knowledge and guide students’ thinking about what they will learn (e.g.,

“Who are the people living in Texas in 1835, right before the Texas Revolution begins?”). Read the questions that students will focus on during the reading.

2. Model thinking aloud as you read aloud in order to make sense of text (e.g., “The title of today’s reading, *The Siege of the Alamo*, tells me I am going to learn about how the Texan soldiers were surrounded at the Battle of the Alamo. I know *siege* means ‘to surround’ and that the Texans lost the fight at the Alamo.”).
3. Demonstrate how to generate different types of questions with varying levels of difficulty, allowing students to respond to these questions (e.g., “What does *lay siege* mean?” “How is a captive different from a hostage?”).

Paired student reading provides opportunities for students to work cooperatively to use strategies to improve their comprehension of the vocabulary and text. When pairs read aloud, they take turns reading the same text, with the more proficient student going first. One student reads while the partner follows along and gives corrective feedback (e.g., “You skipped a word,” or “That word is...” ) as needed. After completing the reading, pairs work on answering the assigned comprehension questions. Students are also encouraged to generate and answer their own questions to identify the most important ideas and to check their own understanding of the text. Once the reading activity is completed, teachers discuss students’ answers to the questions with the whole class.

### **Wrap-Up Activity Using Graphic Organizers**

Teachers bring closure to a lesson by asking students to complete a graphic organizer or some other brief activity that connects reading to writing through description, explanation, comparison, or summarization of important information covered in the lesson (Figure 3).

Steps for conducting the writing activity include the following:

1. Introduce the activity.
2. Display the graphic organizer and provide explicit procedures for completing it.
3. Remind students that graphic organizers and other activities are used to display the most important information (i.e., main ideas) from the lesson.

**How did people feel about the Texas Revolution? What were they fighting for? Was their cause just?**

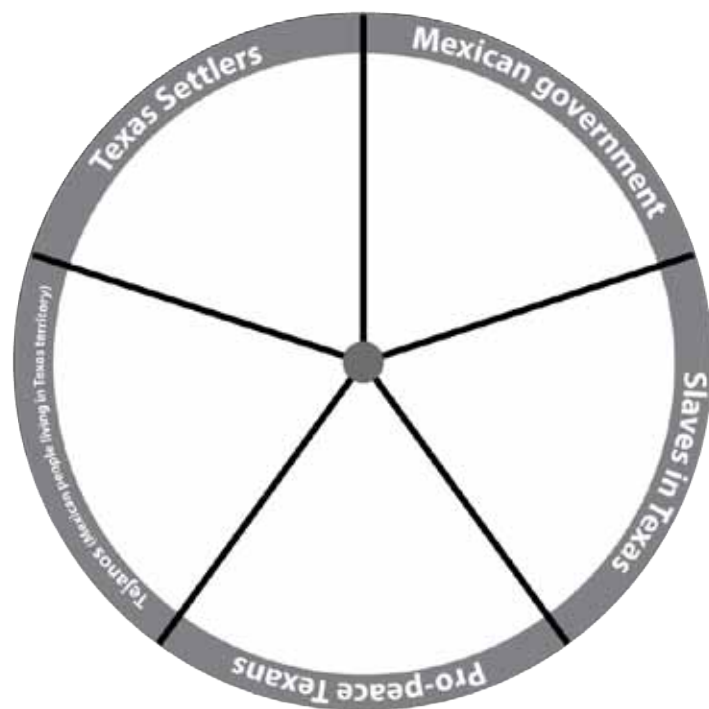


Figure 3. Graphic organizer—review/assessment activity.

4. Direct students to identify the essential information to include in the writing task with their assigned partner.
5. Allow time after collaboration for students to work independently to complete the writing task.
6. Review students' responses and provide feedback to the whole group.
7. Tie the conclusion of the lesson back to the content and language objectives presented at the beginning of the lesson.

## Conclusion

The unique learning needs of adolescent English language learners demand that effective second language instruction be embedded in content area classes. This, in turn, requires building secondary educators' knowledge base and capacity to deliver instruction that supports literacy and content learning. Research findings from CREATE thus far indicate that it is possible to improve the quality of social studies instruction to better meet the needs of English language learners and to improve their performance without delaying learning for English-speaking monolingual students, who are often in the same content area courses. Considering the number of

readers in upper elementary and middle school classrooms who struggle with academic language and grade-level textbooks, these recommended social studies practices can and should be incorporated into content area teaching. Providing instructional supports that target both content and English language learning objectives in English-only settings makes effective strategy instruction accessible to *all* students. Class-wide interventions may serve to supplement the skills of many, while possibly preventing the difficulties that arise for some older second language learners and others prone to struggling with content area text and academic and content-specific vocabulary.

## References

- August, D. L., & Shanahan, T. (2008). *Developing reading and writing in second-language learners*. NY: Routledge.
- Biancarosa, G., & Snow, C. E. (2006). *Reading next—a vision for action and research in middle and high school literacy: A report from the Carnegie Corporation of New York* (2nd ed.). Washington, DC: Alliance for Excellence in Education.
- Echevarría, J., Vogt, M., & Short, D. (2010). *Making content comprehensible for secondary English learners: The SIOP® Model*. Boston: Allyn & Bacon.
- Francis, D., Rivera, M., Lesaux, N., Kieffer, M., & Rivera, H. (2006). *Practical guidelines for the education of English language learners: Research-based recommendations for instruction and academic interventions* (under cooperative agreement grant S283B050034 for U.S. Department of Education). Portsmouth, NH: RMC Corporation, Center on Instruction. Available at <http://www.centeroninstruction.org/files/ELL1-interventions.pdf>
- Foorman, B. R., & Hedges, L. V. (Eds.). (2009). Effective practices for English language learners in the middle grades [Special issue]. *Journal of Research on Educational Effectiveness*, 2(4).
- Gersten, R., Baker, S. K., Smith-Johnson, J., Dimino, J., & Peterson, A. (2006). Eye on the prize: Teaching complex historical content to middle school students with learning disabilities. *Exceptional Children*, 72(3), 264-280.
- National Reading Panel. (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction* (NIH Publication No. 00-4769). Washington, DC: U.S. Department of Health and Human Services, National Institute of Health and Human Development.

RAND Reading Study Group. (2002). *Reading for understanding: Toward a research and development program in reading comprehension*. Santa Monica, CA: RAND Corporation.

Short, D., & Fitzsimmons, S. (2007). *Double the work: Challenges and solutions to acquiring language and academic literacy for adolescent English language learners—A report to the Carnegie Corporation of New York*. Washington, DC: Alliance for Excellent Education.

Torgesen, J. K., Houston, D. D., Rissman, L. M., Decker, S. M., Roberts, G., Vaughn, S., Wexler, J., . . . Lesaux, N. (2007). *Academic literacy instruction for adolescents: A guidance document from the Center on Instruction*. Portsmouth, NH: RMC Research Corporation.

---

## About CREATE

CREATE, the Center for Research on the Educational Achievement and Teaching of English Language Learners, is conducting a program of research designed to address the critical challenge of improving educational outcomes for English language learners in the middle grades by

- Enhancing the empirical research base for readers in Grades 4–8
- Using both narrative and expository text to develop and test effective interventions that promote content knowledge and language and literacy development
- Investigating the features of instruction and text modifications that facilitate learning for English learners (e.g., traditional instruction vs. ESL-enhanced instruction, teacher-guided instruction vs. group work, traditional text vs. modified text)
- Designing, testing, and delivering professional development that ensures that teachers implement effective classroom practices to help English learners achieve high standards

**For more information, visit the CREATE Web site**

**[www.cal.org/create](http://www.cal.org/create)**



---

The Center for Research on the Educational Achievement and Teaching of English Language Learners (CREATE) conducts a program of research designed to address specific challenges in the education of English language learners in Grades 4–8. CREATE is a partnership of researchers from six institutions:

- |  |  |
|--|--|
| • Texas Institute for Measurement, Evaluation, and Statistics, University of Houston | • Harvard University                                 |
| • California State University, Long Beach  | • University of California–Berkeley                  |
| • Center for Applied Linguistics   | • Vaughn Gross Center, University of Texas at Austin |

This brief was produced by CREATE with funding from the U.S. Department of Education (ED), Institute of Education Sciences, under Contract No. ED-R305A05056. The opinions expressed in this report do not necessarily reflect the positions or policies of ED. This document is in the public domain and may be reproduced without permission.

# Improving Reading Across Subject Areas With Word Generation

Joshua F. Lawrence, Claire White, and Catherine E. Snow, Harvard Graduate School of Education

## Introduction

In 2008, approximately 10.8 million children ages 5–17 in the United States spoke a language other than English in the home (Aud et al., 2010). While most language minority students receive all of their instruction in English, 3.8 million students received English language learner services during the 2003–2004 school year (Capps, Fix, Murray, Ost, Passel, & Herwanto, 2005). Compared with their native English-speaking peers, language minority students on average have lower reading performance in English (August & Shanahan, 2006). While numerous factors account for this gap, researchers have pointed to differences in word knowledge as part of the explanation. Language minority students have both less depth (Verhallen & Schoonen, 1993) and less breadth of vocabulary. In order to read with clear comprehension, students also need to understand the words they read, construct an interpretive cognitive model of what the author is trying to say, and have the requisite background knowledge to categorize, interpret, and remember what an author is saying in relation to established facts or a field of understanding (such as a content area subject). Although a deficit in any of these areas may prevent an adolescent reader from comprehending grade-level texts, deficits in vocabulary knowledge (and in the world knowledge indexed by vocabulary knowledge) may be the most widely shared problem among struggling adolescent readers.

One way that vocabulary supports reading comprehension is through reading subskills. There is substantial evidence that phonological, orthographic, and semantic processing of words are interrelated, such that vocabulary knowledge predicts rates of word reading (Nation & Snowling, 2004), and students with better semantic abilities

also have advantages in orthographic identification tasks (Yang & Perfetti, 2006). Vocabulary knowledge also plays an important role in students' higher order comprehension abilities. Established as well as current models of reading comprehension argue that word meaning and form selection are critical to creating a situation model from text and for integrating new knowledge from the text with prior background knowledge (Kintsch, 1986; Perfetti, Landi, & Oakhill, 2005). Recent reviews of research on adolescent literacy demonstrate that these higher order processes are exactly where most struggling adolescent readers break down (Kamil, 2003; Rand Reading Study Group, 2002); thus it is not surprising that vocabulary scores show increasingly strong correlations with reading comprehension scores as students move from primary to middle and secondary grades (Snow, Porche, Tabors, & Harris, 2007).

A challenging subdomain of vocabulary knowledge acquisition and instruction is all-purpose academic vocabulary, a segment of the lexicon that becomes particularly relevant to comprehension in adolescence. All-purpose academic vocabulary is a category with somewhat fuzzy boundaries, but prototypical members are words used for making fine distinctions in referring to communicative intents (e.g., *affirm*, *confirm*), argumentation (e.g., *evidence*, *conclusion*, *warrant*), abstract entities (e.g., *theory*, *factor*, *process*), and categories (e.g., *vehicle*, *utensil*, *artifact*). All-purpose academic words are used across content areas, occur frequently in glossaries where content-area words are defined, and receive little explicit instructional attention precisely because they are not seen as the responsibility of any content-area teacher. Yet control over this segment of the lexicon is crucial to comprehending and producing academic language.



This is the vocabulary domain on which the research program described in this brief focuses.

By the time normally developing children enter middle school, most will have mastered thousands of words for oral use, but comprehension of the rich language of text requires an understanding of more and different words (Nation, 2006). In middle school, students begin to take core subject area classes and are expected to read and understand expository texts with increasingly difficult vocabulary demands (Gardner, 2004). Clearly, exposure to new words in texts is one of the primary vehicles for word learning (Nagy & Anderson, 1984; Nagy & Herman, 1987). However, there are differences in students' abilities to learn new words incidentally while reading; these differences relate to their concurrent vocabulary levels (McKeown, 1985) and to their comprehension levels (Swanborn & de Glopper, 2002). Without instruction and support, independent reading is unlikely to improve word-learning outcomes for students of low socioeconomic status, although highly skilled readers may benefit (Lawrence, 2009).

Given the evidence that reading comprehension supports vocabulary development and that vocabulary development supports reading comprehension, we can describe the relationship between these two processes as one of reciprocal causation. It has been widely noted that less able students are likely to fall farther and farther behind if they struggle with learning processes linked by reciprocal causation (Stanovich, 1986). Fortunately, there is evidence that vocabulary instruction can have an important and lasting impact on student word learning (Beck, Perfetti, & McKeown, 1982; Carlo et al., 2004). There is reason to think, then, that a robust vocabulary intervention that targets academic language may improve vocabulary and reading comprehension in the short run while also supporting the struggling reader's facility at learning new words independently. The research project described here presents findings from an unmatched quasi-experiment of the Word Generation Program, an intervention firmly grounded in what is currently known about effective practice, while also casting light on how enhanced vocabulary levels relate to improved reading comprehension. While findings from a quasi-experiment are not firm grounds for causal inference, the data here are suggestive and form the basis for our ongoing randomized trial. The actual program itself can be downloaded for free at [www.serp.institute.org/word-generation](http://www.serp.institute.org/word-generation). More information about how the program was created and how words were selected is also avail-

able on the Web site and in published studies (Lawrence, White, & Snow, 2010; Snow, Lawrence, & White, 2009).

## Program Implementation

The Word Generation materials define a list of key elements that are used to organize instruction. Those elements include the following:

- **Monday launch:** Reading a paragraph aloud with students that introduces a civic dilemma, modeling comprehension processes and word inferencing during reading, guiding discussion through comprehension questions, highlighting focus words, eliciting student opinions on the controversy of the week. This is usually done in English class.
- **Math activity:** Recurrently using target vocabulary in all-purpose and (if applicable) math-specific ways, engaging students in discussion of math problems, reminding students of controversy and soliciting their thinking about it, revoicing student comments to model clarity and target word use.
- **Science activity:** Recurrently using target vocabulary in all-purpose and (if applicable) science-specific ways, linking topic of the week to science content, reminding students of controversy and soliciting their thinking about it, revoicing student comments to model clarity and target word use.
- **Social studies activity:** Recurrently using target vocabulary in all-purpose and (if applicable) social studies specific ways, structuring a debate format, giving all students a chance to participate in debate, revoicing student comments to model clarity and target word use.
- **Friday writing:** Reviewing the controversy and reading the prompt aloud, reminding students to reread the paragraph or their notes to make good arguments for their point of view, having the target words posted or written on the board, ensuring quiet and order so students can write uninterrupted.

## Quasi-Experiment of Word Generation in Partnership With Boston Public Schools

In 2007, our research team began a quasi-experimental study in which academic word learning by students in five schools implementing the Word Generation Program was compared to academic word-learning by students in three schools within the same system that did not choose to implement the program. Because the imple-

menting schools were those that volunteered for the program, selection effects must be taken into account in interpreting the findings. The results presented here have been described in greater depth elsewhere (Snow, Lawrence, & White, 2009).

## **Participants and Setting**

### **Schools**

At the start of the study, the average scores of the intervention schools on the state accountability assessment were lower than those of the comparison schools (mean of 56% failing in the treatment schools compared with 45% failing in the comparison schools). This is not surprising; the participating schools volunteered to do so, and those with lower scores were more likely to show an interest. We do not have detailed information about the vocabulary instruction in the comparison schools. Through limited observation and interviews we know that there is discipline-specific vocabulary being taught in each of the comparison schools as required by that state's curriculum framework. Furthermore, in one school, a long-time literacy coach had coordinated vocabulary instruction to some extent through a school-wide word-of-the-week effort. That being said, none of the comparison schools was using a commercial vocabulary program, nor were any heavily invested in a school-wide approach to vocabulary instruction.

### **Students**

All students in the treatment schools received the intervention; both pre- and posttest data were available on 697 sixth-, seventh-, and eighth-grade students (349 girls and 348 boys) in the five treatment schools and 319 students (162 girls and 157 boys) across the three comparison schools. Of these, 438 students were classified as language minority (i.e., students whose parents reported preferring to receive materials in a language other than English); 287 in treatment schools and 151 in comparison schools. The vast majority of students in both treatment and comparison schools were low-income.

## **Research Design**

### **Data Collection and Analysis**

The efficacy of the intervention was assessed using a 48-item multiple choice test that sampled words from throughout the year. A high proportion of students failed to complete the vocabulary assessments in the time available. Because items at the end of the assessment had particularly low rates of completion, we dropped the last four items from our analysis of both pre- and posttest.

The reliability of the test with the 40 items that remained was acceptable (Cronbach's  $\alpha = .876$ ).

This instrument was administered to students in all of the treatment schools in October 2007, before the introduction of Word Generation materials. Because of difficulty recruiting the comparison schools, the pretest was not administered at these schools until January. The posttest (identical to the pretest except for the order of items) was administered in all of the schools in late May. Because of the unfortunate disparity in interval between pre- and posttesting in the two groups of schools, we analyzed words learned per month as well as total words learned.

In addition to this curriculum-based assessment, we had access to most students' spring 2008 scores on the Massachusetts Comprehensive Assessment System (MCAS) English Language Arts. Additionally, we had Group Reading and Diagnostic Evaluation (GRADE; Williams, 2000) for both spring and fall for a selection of students in comparison ( $n = 133$ ) and treatment ( $n = 256$ ) schools. These scores were provided by the district for all the students for whom data were available. The decision to administer the GRADE was made at the school and classroom level. Thus, while these data are far from complete, we have no reason to think that there was a particular sampling bias across the schools.

### **Findings**

Descriptive statistics show that students in the Word Generation Program learned approximately the number of words that differentiated eighth from sixth graders on the pretest. In other words, participation in 20–22 weeks of the curriculum was equivalent to two years of incidental learning. Unfortunately, the relative improvements in the Word Generation schools will be exaggerated by the differences in timing of the pretest. In order to account for the differences in test administration times, the pre-to-post improvement in all schools was divided by the number of months between the pre- and posttest administrations: the average improvement per months in the treatment schools was greater than that in the comparison schools. The average effect size of program participation on the researcher-developed vocabulary assessment was 0.49 (controlling for the improvement attained in the comparison schools).

Regression analysis was used to determine if participation in Word Generation predicted improved vocabulary outcomes, controlling for the pretest. Boys learned more words than girls ( $\beta = -0.052$ ,  $p < .007$ )

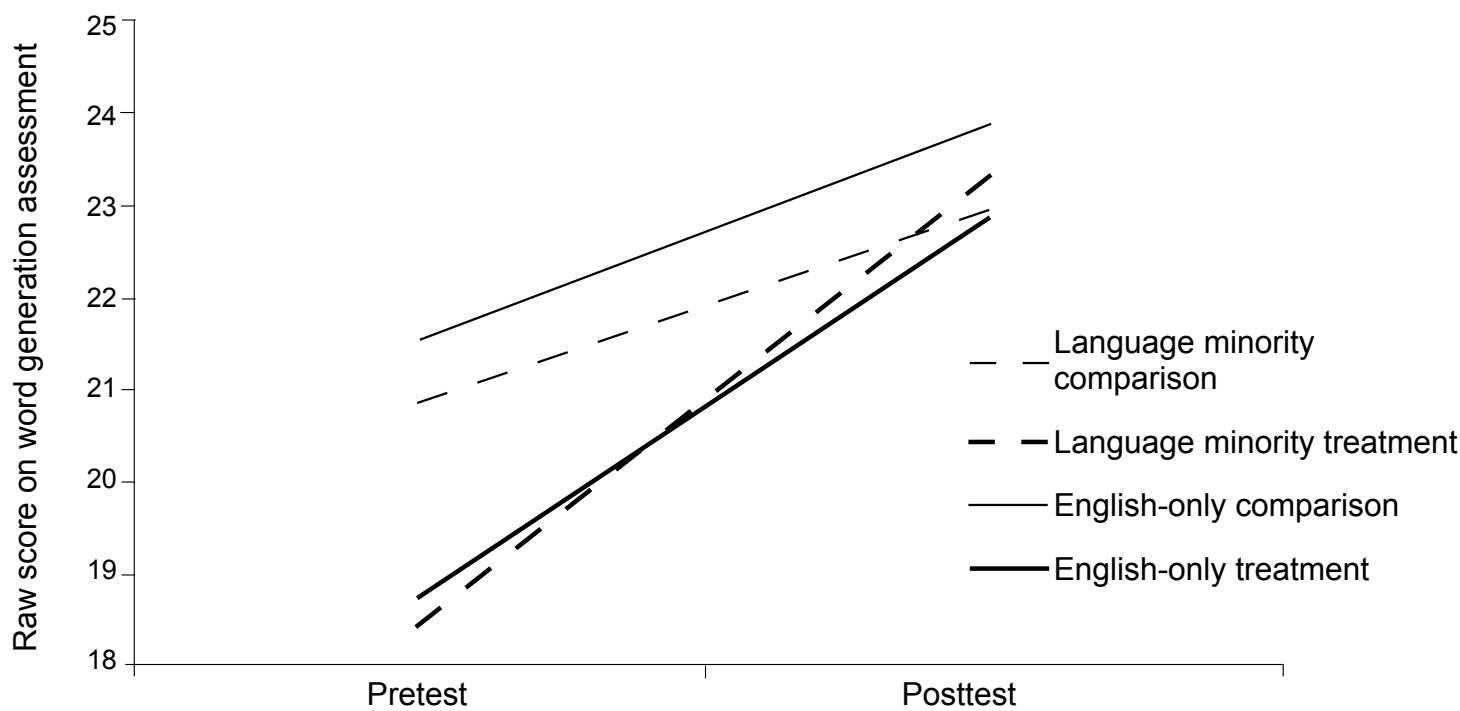


Figure 1. Vocabulary improvement for English-only and language minority students in Word Generation and comparison schools.

and participants in the program learned more words than nonparticipants ( $\beta = 0.166, p < .001$ ). Language status (language minority versus English only) was not a significant independent predictor of word learning, but language minority students learned words at a relatively faster rate than English-only students in treatment schools, but not comparison schools (language status interacted with treatment at the margin of significance,  $p = .055$ ); including the interaction improved the overall model. Interestingly, student pretest vocabulary did not interact with treatment in predicting posttest scores. It was decided to split the data set to investigate the home language variable more closely. The first set of regressions used pretests and gender to predict posttest scores in the comparison schools ( $r^2 = .62$ ) and Word Generation schools ( $r^2 = .64$ ). In Word Generation schools language minority status predicted improved vocabulary ( $\beta = -0.053, p = .022$ ), but it was not a significant predictor in comparison schools. These results are demonstrated in Figure 1: In the comparison schools (the light lines) English-only students improved more than language minority students, in the treatment schools (bold lines) language-minority students improved more than English-only students.

In order to determine whether participation in Word Generation had any relationship to performance on the

MCAS, a regression model was fit with MCAS scores in April 2008 as the outcome; gender, treatment status, pretest, and posttest scores were used as predictors. We added an interaction term to see if posttest scores on the curriculum-based assessment interacted with treatment in predicting MCAS scores (controlling for pretest scores). The interaction term was significant ( $\beta = .21, p = .01$ ) and its inclusion improved the model. In other words, students who benefited most from participation in Word Generation had higher MCAS scores than students with similarly improved vocabularies acquired without Word Generation exposure.

We further explored the interaction between treatment and vocabulary improvement by splitting the data and refitting the models to data from the treatment and comparison schools separately. The fitted model for comparison school data did not predict MCAS achievement ( $R^2 = .41$ ) as well as the fitted model for the treatment school data ( $R^2 = .49$ ). In the Word Generation schools student vocabulary posttest scores ( $\beta = 0.527, p < .001$ ) were much stronger predictors of MCAS achievement than pretest scores were ( $\beta = 0.201, p < .001$ ), perhaps because the posttest scores captured not only target vocabulary knowledge at the end of the year, but also level of student participation in the Word Generation program. These conclusions maintained even when we

used available baseline GRADE data as a covariate in our models.

## Longitudinal Follow-Up on Quasi-Experiment

The goal of Word Generation is to improve vocabulary so that it results in improved reading comprehension; clearly, short-term vocabulary learning will not generate long-term comprehension improvement. Despite the evidence of vocabulary gains for all Word Generation participants on average, and in particular for language minority participants, we did not know whether these students maintained vocabulary knowledge after summer vacation and through the following school year. We conducted a follow-up longitudinal study to examine the effects of Word Generation on the learning, maintenance, and consolidation of academic vocabulary for students from English-speaking homes, proficient English speakers from language minority homes, and limited English proficient students. Using individual growth modeling, we found that students receiving Word Generation improved on average on target words during the instructional period. We confirmed that there was an interaction between instruction and language status such that English-proficient students from language minority homes improved more than English-proficient students from English-speaking homes. We administered follow-up assessments in the fall after the instructional period ended and the spring of the following year to determine how well students maintained and consolidated target academic words. Students who participated in the intervention maintained their relative improvements at both follow-up assessments (Lawrence, Capotosto, Branum-Martin, White, & Snow, 2010). We thus have reason to expect that these students will display improved reading comprehension and enhanced academic learning. A randomized experimental study of Word Generation now underway will enable us to test this expectation more rigorously.

## References

- Aud, S., Hussar, W., Planty, M., Snyder, T., Bianco, K., Fox, M., Frohlich, L., Kemp, J., Drake, L. (2010). *The Condition of Education 2010* (NCES 2010-028). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.
- August, D., & Shanahan, T. (2006). *Developing literacy in second-language learners: Report of the National Literacy Panel on Language-Minority Children and Youth*. Mahwah, NJ: Lawrence Erlbaum.
- Beck, I., Perfetti, C., & McKeown, M. (1982). Effects of long-term vocabulary instruction on lexical access and reading comprehension. *Journal of Educational Psychology*, 74(4), 506-521.
- Capps, R., Fix, M. E., Murray, J., Ost, J., Passel, J. S., & Herwanto Hernandez, S. (2005). *The new demography of America's schools: Immigration and the No Child Left Behind Act*. Washington, DC: The Urban Institute.
- Carlo, M., August, D., McLaughlin, B., Snow, C., Dressler, C., Lippman, D., ... White, C. E. (2004). Closing the gap: Addressing the vocabulary needs of English-language learners in bilingual and mainstream classrooms. *Reading Research Quarterly*, 39(2), 188-215.
- Gardner, D. (2004). Vocabulary input through extensive reading: A comparison of words found in children's narrative and expository reading materials. *Applied Linguistics*, 25(1), 1-37.
- Kamil, M. L. (2003). *Adolescents and literacy: Reading for the 21st century*. Washington, DC: Alliance for Excellent Education.
- Kintsch, W. (1986). Learning from text. *Cognition and Instruction*, 3(2), 87-108.
- Lawrence, J. (2009). Summer reading: Predicting adolescent word learning from aptitude, time spent reading, and text type. *Reading Psychology*, 30(5), 445-465.
- Lawrence, J., Capotosto, L., Branum-Martin, L., White, C., & Snow, C. (2010). *Language proficiency, home-language status, and English vocabulary development: A longitudinal follow-up of the Word Generation program*. Unpublished manuscript, Harvard University
- Lawrence, J., White, C., & Snow, C. (2010). The words students need. *Educational Leadership*, 68(2), 22-26.
- McKeown, M. (1985). The acquisition of word meaning from context by children of high and low ability. *Reading Research Quarterly*, 20(4), 482-496.
- Nagy, W., & Anderson, R. C. (1984). How many words are there in printed school English? *Reading Research Quarterly*, 19(3), 304-330.
- Nagy, W., & Herman, P. (1987). Breadth and depth of vocabulary knowledge: Implications for acquisition and instruction. In M. McKeown & M. E. Curtis (Eds.), *The nature of vocabulary acquisition* (Vol. 19-35). Hillsdale, NJ: Lawrence Erlbaum.
- Nation, I. (2006). How large a vocabulary is needed for reading and listening? *Canadian Modern Language*



- Review/*La Revue canadienne des langues vivantes*, 63(1), 59–82.
- Nation, K., & Snowling, M. (2004). Beyond phonological skills: Broader language skills contribute to the development of reading. *Journal of Research in Reading*, 27(4), 342–356.
- Perfetti, C. A., Landi, N., & Oakhill, J. (2005). The acquisition of reading comprehension skill. In M. Snowling & C. Hulme (Eds.), *The science of reading: A handbook* (pp. 227–247). Malden, MA: Blackwell Publishing.
- Planty, M., Hussar, W., Snyder, T., Kena, G., KewalRamani, A., Kemp, J., ... Dinkes, R. (2009). *The condition of education 2009. (NCES 2009-081)*. Washington, DC: National Center for Education Statistics, Institute of Educational Sciences, U.S. Department of Education.
- RAND Reading Study Group. (2002). *Reading for understanding: Toward an R&D program in reading comprehension*. Santa Monica, CA: RAND.
- Snow, C., Lawrence, J., & White, C. (2009). Generating knowledge of academic language among urban middle school students. *Journal of Research on Educational Effectiveness*, 2(4), 325–344.
- Snow, C. E., Porche, M. V., Tabors, P., & Harris, S. (2007). *Is literacy enough? Pathways to academic success for adolescents*. Baltimore, MD: Paul H. Brookes Publishing Co.
- Stanovich, K. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly*, 21, 360–407.
- Swanborn, M., & de Glopper, K. (2002). Impact of reading purpose on incidental word learning from context. *Language Learning*, 52(1), 95–117.
- Verhallen, M., & Schoonen, R. (1993). Vocabulary knowledge of monolingual and bilingual children. *Applied Linguistics*, 14, 344–363.
- Williams, K. T. (2000). *Group reading assessment and diagnostic evaluation*. Circle Pines, MN: American Guidance Service.
- Yang, C.-L., & Perfetti, C. (2006, July). *Reading skill and the acquisition of high quality representations of new words*. Paper presented at the Society of the Scientific Study of Reading Annual Meeting, Vancouver, Canada.



CREATE, the Center for Research on the Educational Achievement and Teaching of English Language Learners, is conducting a program of research designed to address the critical challenge of improving educational outcomes for English language learners in the middle grades by

- Enhancing the empirical research base for readers in Grades 4–8
- Using both narrative and expository text to develop and test effective interventions that promote content knowledge and language and literacy development
- Investigating the features of instruction and text modifications that facilitate learning for English learners (e.g., traditional instruction vs. ESL-enhanced instruction, teacher-guided instruction vs. group work, traditional text vs. modified text)
- Designing, testing, and delivering professional development that ensures that teachers implement effective classroom practices to help English learners achieve high standards

**For more information, visit the CREATE Web site**

**[www.cal.org/create](http://www.cal.org/create)**

The Center for Research on the Educational Achievement and Teaching of English Language Learners (CREATE) conducts a program of research designed to address specific challenges in the education of English language learners in Grades 4–8. CREATE is a partnership of researchers from six institutions:

- Texas Institute for Measurement, Evaluation, and Statistics, University of Houston
- Harvard University
- California State University, Long Beach
- University of California-Berkeley
- Center for Applied Linguistics
- Vaughn Gross Center, University of Texas at Austin

This brief was produced by CREATE with funding from the U.S. Department of Education (ED), Institute of Education Sciences, under Contract No. ED-R305A05056. The opinions expressed in this report do not necessarily reflect the positions or policies of ED. This document is in the public domain and may be reproduced without permission.

# The SIOP Model: A Professional Development Framework for a Comprehensive School-Wide Intervention

Jana Echevarría, California State University, Long Beach  
Deborah J. Short, Center for Applied Linguistics

Educators are concerned about the academic attainment of English language learners in U.S. schools as their numbers continue to grow and their performance lags behind English-speaking peers. For teachers of English language learners, it can be challenging to teach rigorous, standards-based content to these students at the same time they are developing English language proficiency. In search of approaches to improve teaching and learning in middle schools, CREATE researchers tested several research interventions in science, social studies, and language arts classrooms with English language learners from the 2005-2006 school year to 2008-2009. In 2009, they decided to apply their combined research findings to the development of a school-wide intervention and test this more comprehensive approach in Grade 7 classrooms. In this brief, we explain how a common professional development framework, the SIOP (Sheltered Instruction Observation Protocol) Model, was used to unite the separate research studies to create the school-wide, comprehensive intervention in an effort to support English language learners across the core content areas.

## The SIOP Model

The SIOP Model, an approach for integrating language development with content teaching, provides teachers with guidance for planning and delivering effective lessons. It was developed through a federally funded research project. Subsequently, it has been validated as a model of instruction that improves the achievement of students whose teachers use the model (Echevarría, Richards-Tutor, Chinn, & Ratleff, 2011; Echevarría, Short, & Powers, 2006; Short, Fidelman, & Louguit, in

press). It has been tested in multiple content areas and across all grade levels.

The SIOP Model is made up of eight components, each of which is supported by empirical studies, and the model itself has a growing research base (Short, Echevarría, & Richards-Tutor, 2011). The SIOP Model's 8 components and 30 features provide the framework for planning integrated language and content lessons, and the model can be used as a valid observation instrument as well (Echevarría, Vogt, & Short, 2008, 2010; Guarino et al., 2001). The eight components are

1. Lesson Preparation
2. Building Background
3. Comprehensible Input
4. Strategies
5. Interaction
6. Practice & Application
7. Lesson Delivery
8. Review & Assessment

To illustrate, the features of the Building Background component are shown in Figure 1. When the SIOP protocol is used as an observation tool, each feature of the SIOP Model has a range of possible scores to indicate the level of implementation in a lesson. A score of 4 indicates best practice.

## CREATE's Content Area Studies

Some background on each intervention developed and tested in CREATE's early years is useful for understanding the process by which the school-wide intervention was generated. (See Additional Resources From Create

Building Background

4	3	2	1	0	NA
7. <b>Concepts explicitly linked</b> to students' background experiences		<b>Concepts loosely linked</b> to students' background experiences		<b>Concepts not explicitly linked</b> to students' background experiences	
Comments:					
4	3	2	1	0	
8. <b>Links explicitly made</b> between past learning and new concepts		<b>Few links made</b> between past learning and new concepts		<b>No links made</b> between past learning and new concepts	
Comments:					
4	3	2	1	0	
9. <b>Key vocabulary</b> emphasized (e.g., introduced, written, repeated, and highlighted for students to see)		<b>Key vocabulary</b> introduced, but not emphasized		<b>Key vocabulary</b> not introduced or emphasized	
Comments:					

Figure 1. SIOP Building Background component and features.

for more information on these studies, which involved science, social studies, and English language arts classrooms.)

The SIOP Model Science Study

The SIOP Model was the focus of one CREATE science study. As part of this study, researchers and teacher consultants developed units comprised of SIOP lessons designed to make the science topics comprehensible to English language learners through various instructional techniques and also to develop their academic science language and literacy skills. Each of the SIOP lesson plans included the following elements: associated state science standard, lesson topic, content and language objectives, motivation/background building, presentation of new information and key vocabulary, practice and application activities, review, and informal assessment. Researchers also developed science language assessments for each unit.

One goal of this study was to determine whether giving teachers these science units, in conjunction with SIOP professional development (workshops and coaching), could jump start their implementation of the model and help them reach higher levels of fidelity. The second goal of the study was to have a positive impact on the performance of all students in the classes, such as English language learners, former English learners, and native English speakers. To test these goals in 2006-2007, middle schools were assigned to treatment

(five schools) or control (three schools) conditions, and Grade 7 was selected for study. The treatment teachers received professional development on the SIOP Model over the course of one semester, and they taught four SIOP science units: Cell Structure and Function, Photosynthesis and Respiration, Cell Division, and Genetics. Coaches observed instruction and gave teachers feedback several times each month. Control teachers taught these same four units using the same textbook but with their own lesson plans and teaching methods. They received no coaching. Both sets of teachers were observed and their lessons were rated using the SIOP protocol. Results showed that students in the treatment classes outperformed control students (Echevarría, Richards-Tutor, Canges, & Francis, in press) and the higher the level of SIOP implementation, the better the students performed on assessments (Echevarría et al., 2011).

Quality English and Science Teaching (QuEST)

Another early CREATE intervention also focused on science. It too was designed to develop the science knowledge and academic language of English language learners and their English-proficient classmates. Researchers and teacher consultants developed 10 to 12 weeks of lessons and instructional materials based on the district curricular units and learning objectives. The approach followed the Five-E model (Bybee et al., 2006) with learning activities designed to engage, explore, explain, extend, and evaluate. The curriculum also called for

direct instruction of general academic and discipline-specific vocabulary using interactive vocabulary cards, activities, and glossaries. Teachers were shown how to scaffold learning by using visuals and illustrations, graphic organizers, models of experiments, multimedia resources, and other techniques to ensure comprehension. Teachers were also shown how to engage students in rich, text-based discussions.

The intervention was implemented in 10 sixth-grade science classrooms in five middle schools. QuEST teachers were randomly assigned to teach two science classes using the district's standard science curriculum and two science classes using the QuEST materials and strategies. Results showed that the QuEST lessons and materials improved students' knowledge of science concepts and vocabulary (August, Branum-Martin, Cardenas-Hagan, & Francis, 2009).

### ***Adaptations of Peer-Assisted Learning for English Language Learners in Social Studies***

Designed to improve students' understanding of social studies content and expository text, this intervention provided all students with opportunities to learn and use the vocabulary, concepts, big ideas, and issues associated with Grade 7 social studies units. Lessons were organized around instructional routines that included the following: presentation of content and language objectives, brief overview of a "big idea," explicit vocabulary instruction, use of a 2- to 4-minute video clip and purposeful discussion to build conceptual knowledge, assigned reading followed by students generating and answering questions, and a wrap-up writing activity or graphic organizer to review and assess learning. Much of the vocabulary and reading comprehension work was carried out by structured paired groupings of students. To design the pairings, teachers ranked the English language learners and native English speakers separately by reading and language levels and then paired the highest ranked English language learner with the highest ranked native English speaker, the next highest English language learner with the next highest native speaker, and so forth.

Four teachers in two schools participated in the study as treatment or control classrooms. The treatment teachers implemented the lessons for about 12 weeks and the control teachers covered the same curriculum topics, using their typical instruction. The findings showed that this intervention facilitated learning of academic vocabulary and content information found in expository text for all students (Vaughn et al., 2009).

### ***Adapting Texts to English Language Learners' Needs***

Another of the CREATE projects modified an interdisciplinary, middle school academic vocabulary program known as Word Generation (see <http://wordgeneration.org/proven.html> for more on this study) to focus on English language learners (Snow, 2010). Word Generation uses engaging paragraphs on contemporary issues to present crucial, all-purpose academic words and provides activities to help students learn them. Students were introduced to five general academic words each week in the context of researcher-developed introductory texts. Each of these texts introduced a dilemma and provided information from which one could argue the pros and cons of the issue. Students took positions about the issue presented in the reading and argued their own positions, necessarily using the academic words in the process. They wrote a "taking a stand" paragraph each week using arguments developed over the course of the week's readings and discussions. For CREATE, the reading and discussion activities were supplemented with word study activities designed specifically for English language learners, focusing on morphological analysis, cognate use, and etymology.

All of the teachers and students in five treatment schools carried out the intervention. Pre- and post-testing on knowledge of the vocabulary words and on essay-writing ability was carried out in the treatment schools and in matched comparison schools. Findings showed that the intervention, with its focus on cross-curricular vocabulary, promoted academic language development, and treatment students performed better on the assessments than did those in the control schools. These findings replicate earlier reported positive effects of the program for language minority students (Snow, Lawrence, & White, 2009).

### ***Designing a School-Wide Intervention***

As findings from the individual studies emerged, the CREATE researchers considered ways to design an intervention that could be implemented school-wide. They decided that the SIOP Model would be the unifying professional development framework because of its applicability across content areas and its established research base. Multiple studies have called attention to the need for sustained, job-embedded, and research-based professional development if comprehensive school reform is to become a reality (Darling-Hammond & Richardson, 2009; Wei, Darling-Hammond, Andree, Richardson, & Orphanos, 2009). By improving teach-



ing, CREATE researchers believed they could improve student performance. This could be done, in part, by teaching teachers to use effective strategies and techniques. Therefore, the promising practices developed and tested in the individual CREATE studies would be infused in the subject area interventions and in the SIOP professional development as appropriate.

The CREATE researchers also decided to bring mathematics into the mix to ensure a full complement of core content areas: science, social studies, language arts, and math. However, the math teachers would not use a curriculum intervention; rather, their only intervention would be the SIOP professional development. This distinction adds a new dimension to the research analyses (curriculum vs. no curriculum) that will be conducted in the next year.

In order to create the school-wide intervention, the CREATE team decided on the successful elements from each of the previous individual interventions that were implemented in CREATE's earlier years and incorporated them into each subject area of the school-wide intervention. First, as in the SIOP Model Science and the QuEST studies, the intervention lessons would include content and language objectives, and teachers would teach both general academic and content-specific vocabulary words. Second, based on the implementation of the study examining peer-assisted learning in social studies, features such as use of short video clips to build background and structured pair work would be incorporated in the lessons to suit the learning goals. Third, as in the Word Generation study, the subject area interventions would add more writing activities. Finally, as in all the CREATE studies, an emphasis was placed on enhanced oral interaction.

To facilitate these modifications, the SIOP Model lesson template would be used as a structure for lesson planning, with appropriate adjustments for the content areas. The curricula would be written for 10 to 12 weeks of instruction. In most cases, teachers would introduce new material on 4 days of each week and use the 5th day for reteaching and extension. The modified Word Generation lessons would be used for 20 minutes in the language arts classes; the other subject lessons would complete the period of instruction. Math treatment teachers would not receive curriculum units, but would receive support from instructional coaches for lesson planning and delivery.

The SIOP professional development would demonstrate techniques from the individual subject interven-

tions and show their applications to other content areas. The professional development sessions would be coordinated so that teachers received training in the SIOP Model and had one quarter to begin implementation with coaching before they would receive training by subject area on their specific curriculum intervention.

## Implementing the School-Wide Intervention

Ten middle schools participated in the school-wide intervention during the 2009-2010 school year and were randomly assigned to treatment or control conditions. Teachers in Grade 7 were selected as the research participants. Prior to the beginning of the 2009-2010 school year, math, social studies, science, and English language arts teachers in the treatment condition participated in a 3-day workshop in the SIOP Model so that they had an understanding of the instructional needs of English language learners as well as the overarching framework for the study.

Support for implementing the SIOP Model and curricular interventions was provided by instructional support specialists (ISS) who were highly qualified coaches. The ISS team, led by researchers at the University of Texas, Austin, participated in the professional development sessions to become more familiar with each of the interventions and deepen the team members' knowledge of the SIOP Model. The ISS team then worked directly with the teachers, regularly observing instruction in their classrooms and providing feedback. In some cases, particularly with the math teachers, they also helped with lesson planning.

The control teachers in each study delivered regular instruction without curriculum units or SIOP training. Their instruction was observed for research purposes but they did not receive feedback. In the 2010-2011 school year, teachers in three of the control schools became treatment teachers and received the professional development and curriculum interventions as well. A new treatment school joined the study that year, too.

Data were collected in the treatment and control sites during the 2009-2010 and 2010-2011 school years. Teacher implementation levels were measured with the SIOP protocol and other tools to determine their fidelity to the interventions. Student performance was measured with standardized tests and curriculum-based assessments. At present, analyses are being conducted to determine whether this school-wide intervention improved outcomes for English language learners in content knowledge and academic English.



## Conclusion

The intention of the CREATE program of research is to improve the school performance of English language learners. By integrating efforts to support English language learning into content area lessons across the curriculum, the whole-school intervention described here presents a coherent approach to teaching and learning. No teacher is off the hook when it comes to engaging English language learners instructionally; similarly, no student can hide from learning activities that are interactive in nature. Data analyses will reveal how well the CREATE effort has met its goal.

## References

- August, D., Branum-Martin, L., Cardenas-Hagan, E., & Francis, D. (2009). The impact of an instructional intervention on the science and language learning of middle grade English language learners. *Journal of Research on Educational Effectiveness*, 2(4), 345–376.
- Bybee, R. W., Taylor, J. A., Gardner, A., Van Scotter, P., Powell, J. C., Westbrook, A., & Landes, N. (2006). *The BSCS 5E instructional model: Origins and effectiveness*. Colorado Springs, CO: BSCS.
- Darling-Hammond, L., & Richardson, N. (2009). Teachers learning: What matters? *Educational Leadership*, 66(5), 46–53.
- Echevarría, J., Richards-Tutor, C., Canges, R., & Francis, D. (in press). Using the SIOP Model to promote the acquisition of language and science concepts with English learners. *Bilingual Research Journal*.
- Echevarría, J., Richards-Tutor, C., Chinn, V., & Ratleff, P. (2011). Did they get it? The role of fidelity in teaching English learners. *Journal of Adolescent and Adult Literacy*, 54(6), 425–434.
- Echevarría, J., Short, D., & Powers, K. (2006). School reform and standards-based education: An instructional model for English language learners. *Journal of Educational Research*, 99(4), 195–210.
- Echevarría, J., Vogt, M. E., & Short, D. (2008). *Making content comprehensible for English learners: The SIOP® Model* (3rd ed.). Boston: Allyn & Bacon.
- Echevarría, J., Vogt, M. E., & Short, D. (2010). *Making content comprehensible for secondary English learners: The SIOP® Model*. Boston: Allyn & Bacon.
- Guarino, A. J., Echevarría, J., Short, D., Schick, J. E., Forbes, S., & Rueda, R. (2001). The Sheltered Instruction Observation Protocol. *Journal of Research in Education*, 11(1), 138–140.
- Short, D., Echevarría, J., & Richards-Tutor, C. (2011). Research on academic literacy development in sheltered instruction classrooms. *Language Teaching Research*, 15(3), 363–380.
- Short, D., Fidelman, C., & Louguit, M. (in press). Developing academic language in English language learners through sheltered instruction. *TESOL Quarterly*.
- Snow, C. E. (2010). Academic language and the challenge of reading for learning. *Science*, 328(5977), 450–452.
- Snow, C., Lawrence, J., & White, C. (2009). Generating knowledge of academic language among urban middle school students. *Journal of Research on Educational Effectiveness*, 2(4), 325–344.
- Vaughn, S., Martinez, L., Linan-Thompson, S., Reutebuch, C., Carlson, C., & Francis, D. (2009). Enhancing social studies vocabulary and comprehension for seventh-grade English language learners: Findings from two experimental studies. *Journal of Research on Educational Effectiveness*, 2(4), 297–324.
- Wei, R. C., Darling-Hammond, L., Andree, A., Richardson, N., & Orphanos, S. (2009). *Professional learning in the learning profession: A status report on teacher development in the United States and abroad*. Dallas, TX: National Staff Development Council.

## Additional Resources From CREATE

- *Effective Social Studies Instruction to Promote the Knowledge Acquisition and Vocabulary Learning of English Language Learners in the Middle Grades*  
By Colleen Klein Reutebuch (December 2010)
- *Improving Reading Across Subject Areas With Word Generation*  
By Joshua F. Lawrence, Claire White, and Catherine E. Snow (September 2011)
- *Improving Science and Vocabulary Learning of English Language Learners*  
By Diane August, Lauren Artzi, and Julie Mazrum (August 2010)
- *Using the SIOP Model to Improve Middle School Science Instruction*  
By Jennifer Himmel, Deborah Short, Catherine Richards, and Jana Echevarria (May 2009)



CREATE, the Center for Research on the Educational Achievement and Teaching of English Language Learners, is conducting a program of research designed to address the critical challenge of improving educational outcomes for English language learners in the middle grades by

- Enhancing the empirical research base for readers in Grades 4–8
- Using both narrative and expository text to develop and test effective interventions that promote content knowledge and language and literacy development
- Investigating the features of instruction and text modifications that facilitate learning for English learners (e.g., traditional instruction vs. ESL-enhanced instruction, teacher-guided instruction vs. group work, traditional text vs. modified text)
- Designing, testing, and delivering professional development that ensures that teachers implement effective classroom practices to help English learners achieve high standards

**For more information, visit the CREATE website**

**[www.cal.org/create](http://www.cal.org/create)**

---

The Center for Research on the Educational Achievement and Teaching of English Language Learners (CREATE) conducts a program of research designed to address specific challenges in the education of English language learners in Grades 4-8. CREATE is a partnership of researchers from six institutions:

- |  |  |
|--|--|
| • Texas Institute for Measurement, Evaluation, and Statistics, University of Houston | • Harvard University                                 |
| • California State University, Long Beach  | • University of California-Berkeley                  |
| • Center for Applied Linguistics   | • Vaughn Gross Center, University of Texas at Austin |

This brief was produced by CREATE with funding from the U.S. Department of Education (ED), Institute of Education Sciences, under Contract No. ED-R305A05056. The opinions expressed in this report do not necessarily reflect the positions or policies of ED. This document is in the public domain and may be reproduced without permission.

# Using Literacy Coaching to Promote the Teaching and Learning of English Learners in Content Areas

Colleen K. Reutebuch, The Meadows Center for Preventing Educational Risk, The University of Texas at Austin

## Introduction

Literacy coaching was provided as part of a multi-year research project aimed at improving the teaching and learning of English learners across seventh grade content areas (English language arts, math, science, and social studies). Coaching, a sustained classroom-based support, is meant to deliver guidance from a qualified and knowledgeable person who models research-based strategies and explores with teachers how to incorporate those practices with their own students (Sailors & Shanklin, 2010, p. 1). The rationale for including a coaching component was to extend professional development into day-to-day classroom settings, to facilitate implementation of the project interventions, to provide an opportunity for discussion and reflection, and to build educator capacity to sustain practices intended to improve the education of English learners. Ongoing coaching activities involved lesson demonstrations, observations with feedback, support of instructional planning and lesson preparation, and debriefings with time for teacher reflection and goal setting.

The challenge of helping adolescent learners who may have underdeveloped language and literacy skills to succeed academically across content areas requires educators to adjust their instruction to promote English language acquisition. Unfortunately, secondary teachers often express feeling ill prepared to address the learning needs of English learners within the confines of delivering specific instruction (Pawan & Craig, 2011). The Center for Research on the Educational Achievement and Teaching of English Language Learners (CREATE), funded by the Institute of Education Sciences, U. S. Department of Education, was established to address concerns involving the education of

English learners in the middle grades (4–8). CREATE is a partnership of researchers from several institutions tasked with (a) developing and testing research-based academic interventions in controlled experiments and randomized field trials with classroom teachers, (b) rigorously testing the Sheltered Instruction Observation Protocol (SIOP) Model (see Echevarría, Vogt, & Short, 2010), (c) combining interventions and the SIOP Model into a comprehensive package, and (d) testing the effectiveness of the combined package in randomized experiments.

Prior to offering a combined intervention package, project researchers had established and empirically tested curriculum enhancements that investigated effective features of instruction for English learners, including peer pairing and group work, increased opportunities for written and oral discourse, and direct teaching of vocabulary and academic language (see August, Branum-Martin, Cardenas-Hagan, & Francis, 2009; Snow, Lawrence, & White, 2009; Vaughn, Martinez, Linan-Thompson, Reutebuch, Carlson, & Francis, 2009). During the 2009-2010 and 2010-2011 school years, studies of the combined intervention package were conducted with two non-overlapping cohorts of teachers in a large urban district in central Texas. The SIOP Model was integrated into all the academic interventions and served as the project's framework for addressing the needs of English learners. Although mathematics had no curriculum intervention, efforts in that discipline concentrated on using the SIOP Model to augment day-to-day instructional practices. Eight participating campuses (four in 2009-2010 and four in 2010-2011) agreed to adopt these fully developed interventions that were intended to replace typical daily instruction for the entire class period for up

to 13 weeks in science and social studies and to supplement instruction in English language arts for 20 minutes per day across the seventh grade.

Throughout the course of study on the combined intervention package, literacy coaches from the CREATE research team worked onsite at middle school campuses to help seventh grade teachers learn about evidence-based practices and how to assimilate them into their classrooms. While coaching was not the focus of the investigation, researchers reasoned that the use of coaches might be advantageous in getting evidenced-based practices into the treatment classrooms more quickly and with a higher level of implementation and fidelity. Although the coaching experience described here is narrow in its scope, this brief offers researchers, practitioners, and those in school leadership positions insights from project efforts to raise the quality of teaching and learning with coaching as a moderating variable.

## Extending Professional Development

Coaching has the potential to apply and prolong professional development and inservice learning or skill development directly in the classroom (Kamil, 2003; Sailors & Shanklin, 2010; Steckel, 2009). Paired with onsite professional development, coaching may ultimately lead to the transfer and sustainability of evidence-based practices into daily instruction and routines as teachers develop a deeper understanding of these practices (Knight & Cornett, n.d.). Coaching is becoming prevalent in schools as a way to increase student achievement and to more adequately prepare educators to meet students' learning needs.

Prior to the intervention start date in the schools, coaches, teachers, some district- and school-level administrators, and instructional specialists attended 3 days of professional development on the SIOP Model in the fall of 2009 and 2 days in 2010. For teachers of science, social studies, and English language arts, discipline-specific sessions (generally 1–2 days, although this varied slightly by content area) on intervention procedures, materials, roles, and responsibilities were also presented prior to the start date. In 2010, a SIOP-specific session was added for teachers of math. These professional development offerings were reinforced with onsite coaching.

## The Role of the Secondary Literacy Coach

CREATE coaches worked directly with content area teachers to build reading and language skills as well as vocabulary and content knowledge across all disciplines.

This role is different from that of traditional reading coaches, who focus on improving reading and overall achievement and may have supervisory duties and work directly with students.

The CREATE coaching staff was independent of the schools and the district where research was being conducted. They had no site-based duties other than to support the participating educators. Coaches spent the majority of their time on school campuses working one-on-one with classroom teachers or grade-level teams. Coaching responsibilities included modeling, discussing issues and concerns, and assisting in planning and preparing for upcoming lessons. The remainder of the coaches' time was devoted to project paperwork, preparation, ongoing training, and coaching meetings. In general, one coach was assigned to one of the four participating treatment campuses with a load of 10 or 11 teachers throughout each intervention period. In some instances, an additional coach was dispatched to support one or two teachers at campuses with more than two teachers in any discipline. In those cases, one coach served as the lead contact across the grade level.

Minimum requirements for selection of coaches included (a) a master's degree or higher in education that focused on reading/literacy/language learning, curriculum and instruction, or related fields (e.g., special education, educational psychology); (b) 3 years or more of classroom teaching; (c) experience providing professional development; (d) knowledge of adolescent learners, adult learners, and English learners; and (e) experience in providing supervision, mentoring, or coaching.

Coaches were initially perceived by teachers as outsiders on the campuses. Teaching credentials were questioned, with participants asking if coaches had teaching experience at the middle school level. One teacher expressed her fear that coaches would come into her class to promote the teaching of phonics and other practices associated with foundational reading skills. Another commented, "You researchers have a lot of book knowledge, but don't know anything about teaching in the real world." Coaches worked to build rapport and cooperative working relationships with the school personnel, particularly with the classroom teachers to whom they were assigned. One teacher asked, "What are you gonna do for me since I am the one with the degree in history?" His coach replied, "Yes, you are the content expert and I am not here to change what you teach, but rather to help with how you teach it." This type of approach acknowledged that all involved had complementary skill sets and allowed for the foster-



ing of efficacious relationships. This coach went on to explain, “Together, your content knowledge and my knowledge of literacy development and strategies might be just what the students you told me you were worried about need to be successful with your curriculum.”

## The CREATE Coaching Model

The CREATE coaching model was designed to be flexible and responsive to teachers’ needs and to their comfort level with the content, teaching of English learners, project materials, lesson enhancements, and SIOP Model components. The coaches recognized that participating teachers held varying beliefs, attitudes, and levels of expertise, all of which were likely to affect the extent to which they were willing to embed reading and language development strategies into their content area instruction and to maintain their use. The model adopted also took into account that not all campus staff members were as enthusiastic about inclusion in the research study as the district officials who designated which campuses would take part. While involvement was at will, individual teachers and school administrators may have felt obliged to follow the district’s wishes and therefore did not opt out. Research staff observed tensions between some campus and district leaders regarding participation that led to lukewarm support of research activities and may have negatively impacted teachers’ full engagement in implementation of the interventions or in coaching. Furthermore, implementation efforts by some classroom teachers were hindered by personal problems (e.g., divorce, death, illness), varied educational philosophies, dislike of all or part of the project (e.g., materials that included scripted lessons, curriculum enhancements, SIOP components, coaching), and/or anxiety in being under the research lens.

Rather than assuming the role of experts trying to assert what must be implemented, the coaches took a responsive stance, acting as a buffer between the researchers and practitioners with their main goal to help willing teachers try to implement the interventions as designed. Responsive coaching has been described as a better approach to long-lasting changes in classroom practices than more directive approaches (Costa & Garmston, 2002; Dozier, 2006; Ippolito, 2010). In many instances, the coaches’ ability to listen to where the teachers were coming from and where they wanted to be instead of imposing their own ideas allowed for a successful partnering. When teachers felt safe in their attempts to follow the intervention as designed, as well as in their endeavors at making adjustments if they

believed students needed something more or different from what was provided, they were more likely to share criticisms or suggestions for improvements with the coaches or directly with curriculum designers. Once criticisms or suggestions were voiced, the research team could act and often did so immediately, whether it was to send out revised lessons or additional materials to improve lesson activities. By acknowledging teachers as important contributors to the CREATE program and responding to their feedback, coaches were able to alleviate some of the educators’ fears about participation in the project and coaching.

Coaching support was divided into three distinct phases, with levels of support decreasing as teachers became more adept with the interventions (see Figure 1). During the Initial Coaching Phase, coaches spent most of their time with teachers, modeling lessons or SIOP Model components and offering feedback as teachers began implementation. For instance, the content interventions all involved some type of teacher think-aloud or read-aloud, which often took much longer than the suggested times, so coaches proposed use of a timer to help pacing. They also met individually with teachers during the first few weeks of implementation to talk through problem areas, such as the curricula not always aligning with the district scope and sequence, or difficulties with lessons as designed, as well as issues related to classroom and time management.

In the second phase, Coaching With Feedback, formal SIOP Model observations with follow-up debriefing sessions were conducted every 2 weeks. These observations focused on implementation of the SIOP Model features. This provided an opportunity for the coach to emphasize SIOP components that were at times overshadowed by the academic interventions. Although most participants agreed to the formal SIOP observations, not all chose to participate in the conferencing because of time constraints or dislike of the SIOP aspect of the project. For example, one science teacher put it bluntly, “Look, I’m willing to do this [science intervention] because these kids need it, but I already do that other stuff [SIOP components] and it is insulting that researchers from up in their ivory tower who don’t know me or my kids think that they can tell me what I need to do.”

During SIOP-focused observations, coaches completed SIOP Model coaching logs (D. Short, personal communication, August 18, 2009) to guide discussion of the model’s features and their execution within a



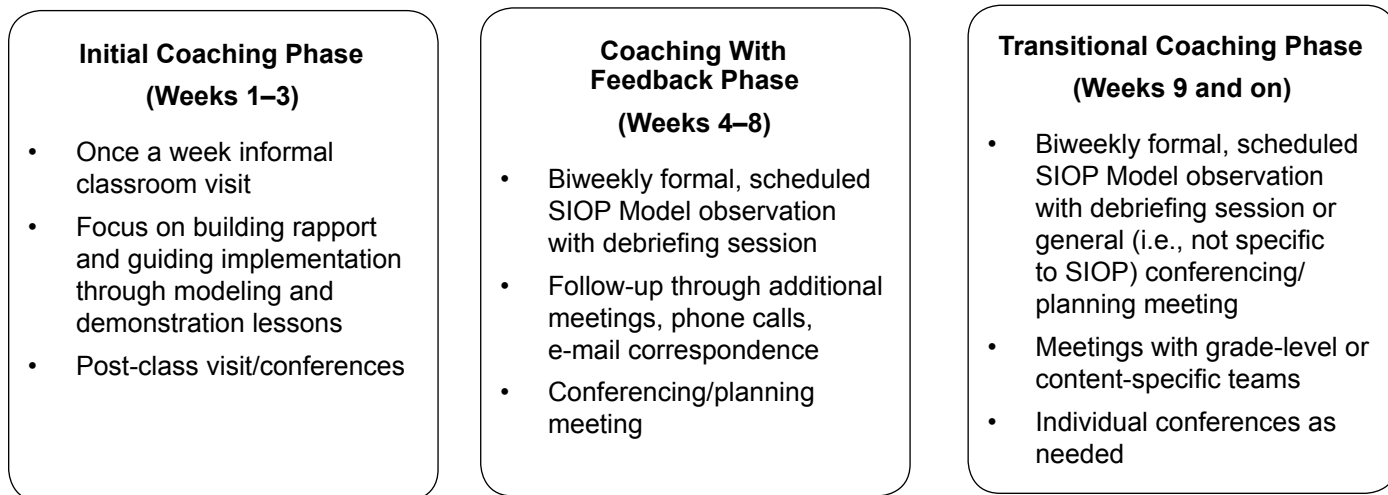


Figure 1. Coaching phases.

<b>Coaching Observation Log 2009–2010</b>	
Coach: _____	
Date: _____	
Teacher/Class Code: _____	
Subject: _____	Topic: _____
SIOP Focus: _____	Length of Observation: _____ mins
<div style="border: 1px solid black; height: 30px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; height: 60px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; height: 60px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; height: 60px;"></div>	

Figure 2. Coaching observation log 2009–2010.

Source. Courtesy of Deborah Short with adaptations by author.

### Coaching Observation Log 2010–2011

School:

Date:

Length of Observation:

Teacher Code:

Subject:

Period:

Content Objectives	Yes/No	Notes
1. Posted		
2. Written in student-friendly language		
3. Meaningful and aligned with lesson taught		
Language Objectives		
1. Posted		
2. Written in student-friendly language		
3. Meaningful and aligned with lesson taught		

\*Focus Component= \_\_\_\_\_

**Notes**

**Figure 3. Coaching observation log 2010–2011.**

*Source.* Courtesy of C. Richards-Tutor with adaptations by author.

presented lesson (see Figure 2). The log was used as a tool to drive reflection and goal setting. For example, review of a completed log reveals that the coach asked a teacher to reflect on whether the outcomes she wanted in her observed lesson were achieved. The log indicates that the teacher intended for students to work in cooperative groups to solve multiplication problems. However, students did not have a clear understanding of the goal, so they worked independently and then shared out their answers.

During the second year of the school-wide investigation, SIOP investigators adapted the log to concentrate coaching attention on the SIOP component of Lesson Preparation (C. Richards-Tutor, personal communication, October 18, 2010). This was in response to a review of the previous year's logs that revealed lessons were lacking in this area deemed critical to the SIOP

Model's success (see Figure 3). These logs were submitted to SIOP researchers for analysis but were not shared with district or school personnel because of the coaches' commitment to keep the coaching relationship private.

The last phase, Transitional Coaching Phase, was aimed at encouraging teacher autonomy for implementation, instructional planning, and decision making. In this phase, the coaches continued to conduct formal SIOP observations and debriefings, but by this point some educators had shifted from individual to school-wide concerns. At Leal Middle School,<sup>1</sup> all participating teachers realized that their students' poor performance on tests at the end of the third 6-week grading period was influenced more by weak academic language skills than by a lack of content-specific knowledge, so they asked their coach to help them in this area. Thus individual conferences often gave way to conferences that

included content or grade-level teams (e.g., all seventh-grade science teachers or content area teams consisting of one teacher from each discipline). Although the phases of coaching were distinct, coaching was responsive to teachers' development. There was not a linear progression through the coaching phases because of differences in teachers' implementation; with some teachers, coaches moved straight into the later phases, and with others, coaches stayed at phase one because teachers made little or no movement at all. Science teachers at one campus had become such devotees to the content enhancements and SIOP Model features after the first few weeks of implementation that they worked to develop additional lessons that picked up where the intervention materials left off. In addition, these teachers worked over the summer to help other grade levels develop science lessons that included CREATE program features. Their coaching needs were very different from those of the two or three teachers per campus who were noted to have used the CREATE lessons and SIOP features only on days when the coach was around. Other teachers adapted the CREATE lessons and practices, but in a manner not adequate to meet English learners' needs. One social studies participant pretaught all the vocabulary in a unit, but instead of introducing three or four words a day as designed, he introduced all the words for a unit on the first day of the week. For these teachers, the earlier phases of coaching were appropriate.

Coaching activities were shaped to respect teachers' schedules and needs. In addition to formal SIOP observations, more informal weekly check-ins also occurred during teachers' conference periods, lunch breaks, and other times when teachers indicated they were available. A few teachers indicated that phone calls or e-mail correspondence was preferable for observation follow-up, and the coaches abided by their wishes. Participants were urged to contact their coach or project coordinator to request more or less frequent coaching. Further, participants could withdraw from study activities at any time, with no repercussions from school or district personnel or the research team.

Information from check-ins with teachers, teacher self-reports gathered during initial professional development sessions, and completed SIOP logs revealed various levels of project interest and involvement, which required different types of coaching behaviors. During the first 3 weeks of implementation, the decision was made that the CREATE staff would concentrate on teachers who were most receptive to implementing the

project lessons and strategies with coaching support. Although the original intention was to provide coaching for all of the project teachers, the actual number and type of coaching sessions held were related to several factors in the schools, including educators' attitudes toward coaching and toward the project as a whole. While about half of the 40 participants in each cohort were open to coaching, others found it disruptive to their routines or students, or unnecessary. As one teacher put it, "I am a good teacher. You [coaches] should spend your time with someone who needs help." Interruptions to class schedules (e.g., assessments, testing preparation, nonacademic activities) along with the school context in which coaches were placed also affected the amount of coaching that could be provided.

Coaches intended to offer what Vanderburg and Stephens (2010) have classified as helpful coaching behaviors: facilitating, demonstrating, and encouraging. But during a weekly coaches meeting held soon after coaches began classroom visits, the staff identified the act of acknowledging and accepting participant resistance for whatever reasons as the most important thing they could offer. Teachers who felt they could not commit fully to the project expressed appreciation for not being pressured. "Thank you for understanding where I am coming from," Mrs. Ivy commented to her coach. "This could be really hard, but you just come and listen and I appreciate that," she continued.

As facilitators, coaches could assist with preparation and review of materials collaboratively with teachers, as well as listen to and support their struggles, successes, and reflections. In the role of demonstrators, they focused on modeling lessons and strategies for individual educators in small groups or during class sessions, and provided many practice opportunities for teachers who were uncomfortable with and apprehensive about enhancing and possibly changing their instructional practices. Finally, as encouragers, coaches attempted to establish an atmosphere in which teachers felt safe to implement and honestly evaluate materials and instructional activities and to reflect on how and if their typical practices and beliefs were being impacted. Mr. Franklin's experience is an example of how being part of the study altered his view about the capabilities of second language learners. Prior to implementing he lamented that, "These kids could not and would not participate in class discussions, so I have to do all the talking." Several weeks into the study he commented how surprised he was that English learners were willing and excited to talk on topic when given the opportunity.

## Lessons Learned

In this study, coaching was confined to very specific objectives; that is, to support a combined intervention package, rather than a general focus on improving instruction. Coaches went into classes knowing that change is hard and that teachers are generally resistant to being forced into it. Therefore, coaching efforts were meant to accept and acknowledge resistance to participation, and when possible to facilitate, demonstrate, and encourage—but not coerce—the use of research-based materials, instructional practices, and teaching and learning strategies. For the coaches, their own knowledge about reading and literacy development for adolescents was critical to their effectiveness, but using that knowledge for practical purposes was shaped by an intimate understanding of middle- and upper-grade culture and students, as well as by consideration of stresses and demands on the content area teacher.

Intervention research conducted in school settings is at best a messy enterprise, especially when research goals and objectives do not mesh with established customs. The study design presented many challenges. The intervention started in the middle of the first semester and ended before the end of the second so teachers had to switch back and forth between traditional instructional practices and materials. It also included many components (academic and SIOP Model interventions, some of which competed with existing programs favored by district leaders and/or school level administrators). The presence in the school of so many project staff—investigators, project coordinators, coaches, testers—proved overwhelming to some. Moreover, those involved, including the researchers, did not all have common expectations for coaching (e.g., responsive versus directive).

There were also drawbacks with the coaching model and coaches. The coaching staff's employment began just as the first professional development sessions were scheduled, leaving them insufficient time to prepare, meaning they were learning about SIOP and the specific content area materials and intervention procedures at the same time teachers were. Additionally, the coaching assignment at the school ended once posttesting started, just as some teachers indicated that they were coming to value it. Although all coaches were highly credentialed, some personalities and skills were better suited than others to their assigned campuses and teachers. In some cases, it was not professional attributes, but personal connections that influenced the success of a coaching relationship. In one situation, a teacher had expressed

that her coach had little to offer her as she herself held a doctorate in curriculum studies. However, the discovery of a shared interest in the *Glee* television show opened the door to a successful union. Finally, none of the coaches had secondary-specific content knowledge and that did hamper their abilities at times, especially when teachers did not possess strong content knowledge themselves—some were new to the grade level or were teaching out of content (e.g., a math educator assigned to take over a social studies class).

Despite the many complications, changes to teaching were evident. Science teachers that had long discontinued experiments dusted off their beakers. Social studies teachers began to allow the exploration of perspectives other than those presented in the textbooks. English language arts teachers incorporated word study activities into a curriculum where only literature-related terms had been the norm for instruction. Math teachers identified engagement as an area where they wanted to improve their lessons. Grade-level teams began to reflect on areas where they could build student language across the curriculum and in many classrooms it became acceptable to use one language in support of another. "It wasn't all unicorns and sparkles," one initially hesitant teacher commented about her project involvement. "Sometimes we did not see eye to eye, but seeing the difference in the students made it all worthwhile," she added.

The CREATE coaching experience suggests that coaching is viable for promoting a shift in teachers' instructional beliefs and practices when they are open and willing to take an active part in coaching and when there are classroom structures and procedures in place to control for student behaviors and expectations for learning so that improving instruction can be the focus of continued professional development. Project coaches were able to help some participants try new practices, incorporate evidence-based strategies, and ground instructional decisions in research (conducting think-and read-alouds, preselecting and teaching vocabulary and concepts, and promoting student-led discussion). Participating teachers who had strong support from their school-level leadership team (principal, assistant principals, curriculum specialists), along with sufficient time for instructional planning and problem solving, and who were devoted to addressing the challenges of promoting language and literacy development within content area instruction, were much more likely to engage in coaching and to identify its potential for their own development along with that of their students.

## Note

<sup>1</sup> All names of schools and school staff appearing in this brief have been changed to protect their privacy.

## References

- August, D., Branum-Martin, L., Cardenas-Hagan, E., & Francis, D. J. (2009). The impact of an instructional intervention on the science and language learning of middle-grade English learners. *Journal of Research on Educational Effectiveness*, 2(4), 345–376.
- Costa, A., & Garmston, R. (2002). *Cognitive coaching: A foundation for renaissance schools* (2nd ed.). Norwood, MA: Christopher-Gordon.
- Dozier, C. (2006). *Responsive literacy coaching: Tools for creating and sustaining purposeful change*. Portland, ME: Stenhouse.
- Echevarría, J., Vogt, M. E., & Short, D. (2010). *Making content comprehensible for secondary English learners: The SIOP® Model*. Boston: Allyn & Bacon.
- Ippolito, J. (2010). Three ways that literacy coaches balance responsive and directive relationships with teachers. *The Elementary School Journal*, 111(1), 164–190.
- Kamil, M. (2003). *Adolescents and literacy. Reading for the 21st century*. Washington, DC: Alliance for Excellence in Education.
- Knight, J., & Cornett, J. (n.d.). *Studying the impact of instructional coaching*. Lawrence: University of Kansas Center for Research on Learning.
- Pawan, F., & Craig, D. A. (2011). ESL and content area teacher responses to discussions on English language learner instruction. *TESOL Journal*, 2(3), 293–311.
- Sailors, M., & Shanklin, N. L. (2010). Growing evidence to support coaching in literacy and mathematics. *The Elementary School Journal*, 111(1), 1–6.
- Snow, C., Lawrence, J., & White, C. (2009). Generating knowledge of academic language among urban middle school students. *Journal of Research on Educational Effectiveness*, 2(4), 325–344.
- Steckel, B. (2009). Fulfilling the promise of literacy coaches in urban schools: What does it take to make an impact? *The Reading Teacher*, 63(1), 14–23.
- Vanderburg, M., & Stephens, M. (2010). The impact of literacy coaches: What teachers value and how teachers change. *The Elementary School Journal*, 111(1), 141–163.
- Vaughn, S., Martinez, L. R., Linan-Thompson, S., Reutebuch, C. K., Carlson, C. D., & Francis, D. J. (2009). Enhancing social studies vocabulary and comprehension for seventh-grade English language learners: Findings from two experimental studies. *Journal of Research on Educational Effectiveness*, 2(4), 297–324.

The Center for Research on the Educational Achievement and Teaching of English Language Learners (CREATE) conducts a program of research designed to address specific challenges in the education of English language learners in Grades 4-8. CREATE is a partnership of researchers from six institutions:

- Texas Institute for Measurement, Evaluation, and Statistics, University of Houston
- Harvard University
- California State University, Long Beach
- University of California-Berkeley
- Center for Applied Linguistics
- Vaughn Gross Center, University of Texas at Austin

This brief was produced by CREATE with funding from the U.S. Department of Education (ED), Institute of Education Sciences, under Contract No. ED-R305A05056. The opinions expressed in this report do not necessarily reflect the positions or policies of ED. This document is in the public domain and may be reproduced without permission.



# CREATE: A Comprehensive Model for Instruction of Academic Language and Literacy in the Content Areas

Annie Duguay, Center for Applied Linguistics

## Introduction

English learners continue to lag behind their English-proficient peers in terms of academic achievement (National Center for Education Statistics, 2011). In addition, Hispanics, who make up the largest group of English learners in the United States, have the highest high school dropout rate in the country (Chapman, Laird, Ifill, & KewalRamani, 2011). As a response to this achievement gap and numerous other pressures, teachers are being challenged to teach to more rigorous standards, engage students with more complex text, and ensure that their students are college and career ready. At the same time, research on second language acquisition and best teaching practices for English learners, as reflected in the SIOP Model, calls on teachers to incorporate more peer interaction, visuals, hands-on experiences, prereading activities, and scaffolded writing assignments (Echevarría, Vogt, & Short, 2010). Teachers may find this recommendation for scaffolded learning to be in contradiction with district and state expectations for providing academic rigor and preparing students for independent performance on high-stakes tests. The Center for Research on the Educational Achievement and Teaching of English Language Learners (CREATE) has responded to this challenge by integrating academic language development into the rigorous content area instruction of learners in the middle grades. This research brief is intended to explain instructional implications from the 7-year CREATE program of study as well as to guide practitioners in implementing the findings. School leaders who are interested in reforms that target academic language development within content area instruction to boost the achievement of both English learners and English-proficient

students will benefit from the approach described in this brief. It will also be valuable for preservice and inservice teachers who are interested in practical techniques for creating scaffolded tasks in lesson plans that are aligned with grade-level content standards.

## Research Context and Contributions

During the first 4 years of the CREATE program, researchers conducted separate studies that involved developing curricula for three content areas: social studies, science, and language arts. The intervention sites included classrooms with both English learners and English-proficient students. After 4 years, during which the curricula were tested and revised with promising results (August, Branum-Martin, Cardenas-Hagan, & Francis, 2009; Echevarría, Richards-Tutor, Canges, & Francis, 2011; Snow, Lawrence, & White, 2009; Vaughn, Martinez, Linan-Thompson, Reutebuch, Carlson, & Francis, 2009), the separate studies were integrated into a 2-year, school-wide intervention with an overarching framework of SIOP Model professional development and weekly coaching sessions. Previous research has demonstrated the effectiveness of SIOP as a professional development approach to improve the quality of instruction for English learners (Short, Fidelman, & Louguit, 2012).

Grade 7 teachers at eight middle schools participated in the school-wide intervention. In the first year of this integrated intervention, four schools acted as the control sites, while four schools received the researcher-developed curricula, professional development, and coaching. In the second year, the teachers who had previously been control teachers received the intervention curricula, professional development, and coaching.

In addition to the three content areas originally included in the study, in the final year of research math teachers received SIOP professional development, coaching, and weekly instructional “math tips.” Preliminary results indicate that this whole-school approach with language-rich curricula and intensive professional development has been effective and that it benefits all learners in the classroom, not only the English learners (August & Duguay, 2011; Snow & White, 2011; Vaughn & Reutebuch, 2011).

Several aspects of the CREATE intervention make it unique. Its contributions include the comprehensive model for school-wide planning as well as an experimental study of individual best-teaching practices for English learners. While most previous studies have focused on language development or content knowledge separately, the CREATE project focused not only on rigorous grade-level content but also on integrated academic language development. Researchers incorporated a nuanced approach to language development: Rather than focus solely on content vocabulary items as traditional methods do, they also emphasized high-frequency general academic terms (e.g., *structure, function, implement*) and various morphological forms that characterize academic vocabulary (e.g., *-tion, -ly*), in addition to other language structures. Curricula encouraged use of academic language in frequent, rich, extended student discussion. The shared curricular approach implemented in a comprehensive intervention across content areas yields a coherent framework for teaching and learning. Although the intervention required that teachers modify their practice, the innovations were aligned with the state standards that teachers were accustomed to following. Teachers had support in the form of SIOP professional development and intensive individual coaching. Another notable attribute of CREATE is that the work was carried out in the middle grades, an area that has been sparsely studied despite the distinct language development and literacy needs of students at this level (Biancarosa & Snow, 2004).

## Academic Language in the Classroom

Students’ knowledge of academic language is a significant determinant of their academic success (Francis, Rivera, Lesaux, Kieffer, & Rivera, 2006). However, there is no common definition for *academic language* or a clear understanding of how it reflects content knowledge (Anstrom, DiCerbo, Butler, Katz, Millet, & Rivera, 2010). Although states have identified aspects of academic English for the purpose of creating and imple-

menting English language development standards and English language proficiency assessments, these standards and assessments are mostly utilized by ESL teachers and specialists. Increasingly, content area teachers are recognizing the need to help their English learners and English-proficient students with academic language development, but they lack sufficient guidance, preservice training, or professional development (Ballantyne, Sanderman, & Levy, 2008).

Now teachers are being held accountable to new standards that address academic language. The Common Core State Standards address language in three ways (van Lier & Walqui, 2012): by specifying that language is a factor in all content areas; by targeting the development of communicative and academic language through the English language arts standards; and by focusing standards specifically on language, including vocabulary acquisition, conventions of grammar, and knowledge about language. The CREATE project was well under way before the release of the Common Core State Standards and the forthcoming Next Generation Science Standards, but it addresses academic language development in content areas in ways that are aligned with these standards: by providing SIOP professional development and by developing content curricula featuring explicit instruction of language, such as aspects of morphology, and literacy instruction with grade-level text aligned with content concepts.

## Common Instructional Design Across the Content Areas

While developing the curricular approach for the integrated intervention, researchers began by considering the demographics of the school sites. The majority of the English learners in these schools were bilingual in Spanish and English, and therefore the students would benefit from explicit attention to cognates and translated glossaries. Additionally, the classrooms that participated in the study represented the reality that most English learners are learning alongside their English-proficient peers in mainstream classrooms. Because many of the English-proficient peers could also benefit from attention to academic language, the content and language objectives were pertinent to all students in the class.

In response to teacher reports that students were often unable to read the assigned textbooks or to follow a lecture on content concepts, the project curricula were written to engage students with academic content and concepts from grade-level standards, but with scaffolding to ensure comprehensibility for English learners and

accessibility to all. Examples of scaffolding included heavy use of visuals to define vocabulary terms and concepts, organization of key concepts in graphic organizers, and teacher modeling of science experiments, debate techniques, and expectations for final products. Student engagement was also promoted through high-interest topics, such as comparing current events to the Texas revolution, debating the humaneness of renting pets, or comparing the various forms of social media to determine word meaning; and through participatory activities including classroom debates in English language arts, partner talks in Social Studies, and hands-on science experiments. Teachers also used multimedia to communicate concepts, for example, by delivering instruction through PowerPoint, showing short video clips, and guiding students to explore interactive websites linked to a content concept.

All of the content area curricula emphasized direct vocabulary instruction of content-specific terms, general academic words, and word-learning strategies. Content-specific terms are those that are most frequent in a domain, such as *siege* in social studies or *evaporation* in science. General academic terms are words like *analyze*, *function*, or *factor* that are frequent in all of the subject areas. Word-learning strategies are important because students have to learn about 2,000–3,000 words per year (a word and all of its forms are counted as one word) in order to gain the vocabulary level of the average high school graduate: 50,000 words (Graves, 2006). Teachers cannot possibly teach all of these words, so they need to be strategic in leveraging student knowledge about word parts and cognates, which requires explicit instruction. For example, in English language arts, students in the CREATE classrooms learned that *analyze* is related to *analyzes* and *analyzing* and also to *analysis*, *analytical*, and *analyzable*. This word form instruction is vital. Without it, students taking a high-stakes test may know the forms of words that their teacher has introduced (e.g., *revolve*, *cycle*) but have difficulty applying that knowledge to new forms of the same root (e.g., *revolution*, *cyclic*). This limitation affects their performance even though they may have mastered the content concepts behind the test. In the CREATE interventions, once students were introduced to the meanings of content-specific and general academic vocabulary terms, they practiced the words through speaking, listening, reading, and writing tasks. Teachers reinforced the terms orally and promoted use of the word wall. The words were purposefully embedded in student activities and reading passages and were provided in the form of word banks and sentence

stems for students to use in their writing and discussions. Teachers also used games such as Mix and Match, Bingo, or Ziparound (also called “I have/Who has?”) with the vocabulary terms and definitions.

The literacy practices of the CREATE intervention were also intensive and common across the subject areas. Each lesson included a reading passage that was tightly aligned to the content concepts. Teachers introduced the topic with a big idea or overarching question; read the passage aloud, exposing students to the rich academic text; asked detailed comprehension questions after each chunk of text; prompted interactive discussions based on the text; and asked students to complete a graphic organizer or an activity to demonstrate comprehension of the text, such as preparing a travel brochure to match the description of a biome in the passage. In some classrooms, where the majority of students were able to read independently, students worked in pairs to read the text, answer the questions, and complete the tasks. Teachers could then closely monitor other students and provide reading support as needed.

In addition to interaction with text, the curricula encouraged the students to engage in oral discussions with each other. Each week in English language arts, students engaged in a classroom debate. They were given the vocabulary terms and several argumentative positions relevant to an issue, such as the multi-million-dollar salaries of professional athletes. In social studies, peer interaction was guided by questions following short video clips that presented historical events. In science, short partner talks were built into applying vocabulary words to new contexts, while more extended time was given to answering higher order thinking questions related to science content, such as whether or not twins share the same DNA. In addition, small groups participated in hands-on lab experiments, during which they were prompted to use the academic vocabulary of the lessons. Purposeful partnering and group work were used to give students an opportunity to collaborate on content work with peers as well as to develop their academic oral language skills in a safer environment than the whole-class setting. Such techniques as providing sentence stems, word banks, and graphic organizers for pairs or groups helped to ensure that students were on task and using the academic language of the content area.

See Table 1, Planning a CREATE Content Lesson, for specific examples of each of the instructional techniques highlighted in this section and to follow a guide to develop a similar lesson.

**Table 1. Planning a CREATE Content Lesson.**

General guidelines	Sample CREATE content lesson: Genetics
1. Look at the district lesson <b>scope and sequence</b> and <b>state standards</b> .	<b>State standard:</b> The student knows that reproduction is a characteristic of living organisms and that instructions for traits are governed in the genetic material.
2. Identify the grade-level academic <b>content concepts</b> to be covered and the topic for a particular lesson.	<b>Content concept:</b> Dominant and recessive genes.
3. Decide on the major <b>lesson activities</b> or tasks to be completed and the materials needed, including short, targeted media clips and possible texts.	<b>Lesson activities:</b> Classroom survey on dominant and recessive traits, lab on the frequency of dominant and recessive genes, short video clip on Gregor Mendel.
4. Identify <b>academic language</b> embedded in the texts or tasks that will be assigned to students.	<b>Academic language in the text or task:</b> Description and explanation of genetic traits, writing word forms such as <i>gene/genetic</i> , and listening to a video and taking notes.
5. Write <b>content and language objectives</b> to be posted and presented to students (Himmel, 2012).	<b>Sample content objective:</b> Students will distinguish between dominant and recessive traits. <b>Sample language objective:</b> Students will describe the inherited traits in their families by discussing with a partner and taking notes.
6. Select <b>content vocabulary terms</b> (based on standards).	<b>Science content terms:</b> <i>heredity, dominant trait, recessive trait</i> .
7. Plan an <b>engaging introduction to the lesson topic</b> (e.g., a short video clip, a demonstration, a discussion, or a read-aloud) that connects it to students' lives, past learning, or prior experiences.	<b>Engaging introduction to the lesson topic:</b> Teacher displays a PowerPoint with pictures of dominant and recessive traits (e.g., rolling tongue). Students discuss with a partner which trait they have and fill in a graphic organizer. The class tallies the traits evident in their classroom.
8. Select a <b>text that is aligned</b> with the lesson content and that is not so lengthy or complex that it extends too far beyond the lesson objectives or so simplified as to be confusing or misleading.	<b>Aligned text:</b> The text chosen for this lesson is from the assigned grade-level text and is entitled "Heredity."
9. Based on the text, write questions that assess <b>overall comprehension</b> of the passage as well as questions that promote inferencing and higher order thinking and might prompt student discussion.	<b>Guiding overall question:</b> What are <i>alleles</i> and how do alleles get passed from parents to offspring? <b>Question embedded in the text:</b> How can parents <i>predict</i> the traits of their future child?
10. Determine whether there are <b>language structures</b> or forms that might align with the content of this lesson (e.g., prepositional phrases when discussing geography, <i>-ly</i> adverbs when discussing character actions, or comparative adjectives when contrasting biomes).	<b>Language structure of focus:</b> Students form sentences using the term <i>inherited</i> as a verb (e.g., The child <i>inherited</i> his blue eyes from the recessive alleles of both parents) and as an adjective (e.g., A widow's peak is an <i>inherited</i> trait). The class generates a list of other words ending in <i>-ed</i> that can be verbs and adjectives (e.g., <i>worried, tired</i> ).
11. Select <b>general academic vocabulary</b> terms (e.g., <i>implement, structure, compare</i> ) based on lesson content and the language of the text.	<b>General academic terms:</b> <i>explain, predict</i>
12. Identify language functions that students will be using (e.g., persuasion, comparison, description) and determine ways to remind students how to perform them. Determine how you will <b>scaffold student interaction</b> , perhaps with sentence stems or graphic organizers.	<b>Scaffolding student interaction:</b> Students are given questions for partner talk with sentence stems allowing them to describe a family trait and explain its origin.
13. Decide how and when in the lesson you will <b>introduce</b> the two types of vocabulary terms (general and content-specific) to students. Determine how students will <b>practice</b> these new terms. Students might complete a personal glossary of terms or another graphic organizer, such as a semantic map (Graves, 2006).	<b>Introduction and reinforcement of vocabulary:</b> Teacher introduces the vocabulary prior to the content lesson and the shared interactive reading of the text using visual word cards with an interactive question for students. Words are reinforced in interactive student notebooks, sentence stems, the aligned text, teacher talk, crossword puzzles, and a personal glossary.
14. <b>Review the content and language objectives</b> to ensure that they match the lesson activities and tasks planned.	<b>Reviewing objectives:</b> The teacher rereads the objectives at the end of the lesson. Students rate their current knowledge of the content concepts and use of the language in the language objectives.
15. Review the lesson plan to ensure that students have the opportunity to use <b>all four language domains</b> (speaking, listening, reading, and writing).	<b>Opportunity to use the four language domains:</b> <ul style="list-style-type: none"> <li>• Students discussed their family traits.</li> <li>• Students listened to a short video clip on Gregor Mendel.</li> <li>• Students took notes on classroom traits and completed cloze sentences with proper forms of vocabulary terms.</li> <li>• Students read a text aligned to the content concepts.</li> </ul>



## Benefits to Using a Common Instructional Model Across the Content Areas

In participating CREATE schools, seventh-grade students attended classes throughout the day in which all content area teachers were using the same model of instruction. All intervention teachers had received professional development in the SIOP Model and in using project curricula. Some of the general academic vocabulary terms were also taught across the subject areas, and teachers in different content areas used some of the same interactive activities. The benefits of this consistent approach were evident in the project's results, suggesting the importance of systematic grade-wide planning. With teachers from different content areas introducing similar or identical words and word-learning strategies, students could recognize the utility of general academic vocabulary across content areas and contexts. Through the repetition of routines, activities, and review games, teachers could reduce transition time between lesson activities for effective management. When teachers promoted structured peer conversations, students were able to recognize that oral language engagement is an academic task, valued and evaluated within the classroom. Having a shared inventory of instructional techniques gave teachers a common focus for discussing successes and challenges and for making modifications to their practice. It also allowed school leaders and instructional coaches to focus their classroom observations, workshops, and feedback on instructional techniques that were common goals across the school and responsive to the needs of the students.

## Key Implications From the CREATE Study

While individual research studies have explored many of the practices described above, CREATE's contribution was in combining the approaches in a comprehensive intervention that cut across content areas, integrated content and language learning, and targeted both English-proficient students and English learners. Additionally, the researchers supported teachers by providing the SIOP Model professional development as a framework, curricula aligned to state standards and tailored to the unique needs of students, and weekly coaching sessions. Although school leaders might attempt to implement a handful of these reforms and techniques, it is their systematic combination and a high level of implementation (Echevarría, Richards-Tutor, Chinn, &

Ratleff, 2011) that likely promoted the achievement of students in the intervention group.

Classroom practices to build content knowledge while targeting language development include posting objectives to focus students on the language involved in the content lesson; providing opportunities for content-based oral interaction with diverse partners and groups; directing vocabulary instruction of domain-specific words, general academic words, and word-learning strategies; and using modified grade-level texts that are aligned to content concepts, shared as a group or with a partner, and reviewed through comprehension questions or graphic organizers. Students need opportunities to apply their content knowledge through the use of academic reading, writing, speaking, and listening skills.

While these best practices and scaffolds for English learners are implemented, there is no need to sacrifice grade-level rigor in content classrooms. Early research within the CREATE program demonstrates that English-proficient students in intervention classrooms made significant gains on measures of content knowledge compared with those in control classrooms whose teachers had not received professional development and did not use project curricula (August, Branum-Martin, Cardenas-Hagan, & Francis, 2009).

## Conclusion

Using common curricular approaches and instructional strategies across content areas and grade levels will improve students' content knowledge and academic language development, reduce classroom management issues, and create common objectives for a professional learning community. To undertake such a shared approach, teachers need district support in the form of planning time, professional development focusing on language development across the content areas, curricula with a dual focus on content and language, ongoing coaching from a specialist, and strong communication between administrators and teachers. A team approach strengthens teacher practices and allows for instructional changes to be sustained and to meet the needs of each school and its diverse learners. The CREATE study contributes to school reform efforts by suggesting that school leaders and instructors who implement a comprehensive approach will see benefits in the overall content knowledge and language proficiency of both their English learners and their English-proficient students.



## References

- Anstrom, K., DiCerbo, P., Butler, F., Katz, A., Millet, J., & Rivera, C. (2010). *A review of the literature on academic English: Implications for K-12 English language learners*. Arlington, VA: The George Washington University Center for Equity and Excellence in Education.
- August, D., Branum-Martin, L., Cardenas-Hagan, E., & Francis, D. (2009). The impact of an instructional intervention on the science and language learning of middle grade English language learners. *Journal of Research on Educational Effectiveness*, 2(4), 345–376.
- August, D., & Duguay, A. (2011, November). *CREATE science: Developing science knowledge and academic language in middle grade ELLs*. Presentation at the 2011 CREATE Conference, Austin, TX. (PowerPoint slides available from <http://www.cal.org/create/events/CREATE2011/ppt-presentations.html>)
- Ballantyne, K. G., Sanderman, A. R., & Levy, J. (2008). *Educating English language learners: Building teacher capacity*. Washington, DC: National Clearinghouse for English Language Acquisition.
- Biancarosa, C., & Snow, C. E. (2004). *Reading next—A vision for action and research in middle and high school literacy: A report to the Carnegie Corporation of New York* (2nd ed.). Washington, DC: Alliance for Excellent Education.
- Chapman, C., Laird, J., Ifill, N., & KewalRamani, A. (2011). *Trends in high school dropout and completion rates in the United States: 1972-2009* (NCES 2012-006). Washington, DC: National Center for Education Statistics.
- Echevarría, J., Richards-Tutor, C., Canges, R., & Francis, D. (2011). Using the SIOP Model to promote the acquisition of language and science concepts with English learners. *Bilingual Research Journal*, 34(3), 334–351.
- Echevarría, J., Richards-Tutor, C., Chinn, V. P., & Ratleff, P. A. (2011). Did they get it? The role of fidelity in teaching English learners. *Journal of Adolescent & Adult Literacy*, 54(6), 425–434.
- Echevarría, J., Vogt, M. E., & Short, D. (2010). *Making content comprehensible to secondary English learners: The SIOP model*. Boston: Allyn & Bacon.
- Francis, D., Rivera, M., Lesaux, N., Kieffer, M., & Rivera, H. (2006). *Practical guidelines for the education of English language learners: Research-based recommendations for instruction and academic interventions*. Portsmouth, NH: Center on Instruction. Retrieved from [www.centeroninstruction.org/files/ELL1-Interventions.pdf](http://www.centeroninstruction.org/files/ELL1-Interventions.pdf)
- Graves, M. F. (2006). *The vocabulary book: Learning and instruction*. New York: Teachers College Press.
- Himmel, J. (2012). Language objectives: The key to effective content instruction for English learners. *Colorin Colorado*. Retrieved from <http://www.readingrockets.org/article/49646/>
- National Center for Education Statistics. (2011). *National Assessment of Educational Progress (NAEP) 2011 assessment*. Washington, DC: U.S. Department of Education.
- Short, D., Fidelman, C., & Louguit, M. (2012). Developing academic language in English language learners through sheltered instruction. *TESOL Quarterly*, 46(2), 334–361.
- Snow, C., Lawrence, J., & White, C. (2009). Generating knowledge of academic language among urban middle school students. *Journal of Research on Educational Effectiveness*, 2(4), 325–344.
- Snow, C., & White, C. (2011, November). *Using Word Generation in classes with ELLs: Does discussion really work?* Presentation at the 2011 CREATE Conference, Austin, TX. (PowerPoint slides available from <http://www.cal.org/create/events/CREATE2011/ppt-presentations.html>)
- van Lier, L., & Walqui, A. (2012). *Language and the Common Core State Standards*. Paper presented at the Understanding Language Conference, Stanford University. Retrieved from <http://ell.stanford.edu/sites/default/files/pdf/academic-papers/04-Van%20Lier%20Walqui%20Language%20and%20CCSS%20FINAL.pdf>
- Vaughn, S., Martinez, L., Linan-Thompson, S., Reutebuch, C., Carlson, C., & Francis, D. (2009). Enhancing social studies vocabulary and comprehension for seventh-grade English language learners: Findings from two experimental studies. *Journal of Research on Educational Effectiveness*, 2(4), 297–324.
- Vaughn, S., & Reutebuch, C. (2011, November). *CREATE social studies: Developing social studies knowledge and academic language in middle grade ELLs*. Presentation at the 2011 CREATE Conference, Austin, TX. (PowerPoint slides available from <http://www.cal.org/create/events/CREATE2011/ppt-presentations.html>)

The Center for Research on the Educational Achievement and Teaching of English Language Learners (CREATE) conducts a program of research designed to address specific challenges in the education of English language learners in Grades 4–8. CREATE is a partnership of researchers from six institutions:

- Texas Institute for Measurement, Evaluation, and Statistics, University of Houston
- California State University, Long Beach
- Center for Applied Linguistics
- Harvard University
- University of California-Berkeley
- Vaughn Gross Center, University of Texas at Austin

This brief was produced by CREATE with funding from the U.S. Department of Education (ED), Institute of Education Sciences, under Contract No. ED-R305A05056. The opinions expressed in this report do not necessarily reflect the positions or policies of ED. This document is in the public domain and may be reproduced without permission.

# Effective Practices for Increasing the Achievement of English Learners

Jana Echevarría, California State University, Long Beach

## Introduction

As schools focus on preparing students to be college and career ready, the achievement of English learners is a critical issue. It is widely acknowledged that English as a second language programs alone cannot adequately serve the large and growing numbers of English learners in U.S. schools (Brisk, 2010). These students also benefit from content area teachers using strategies and techniques that make subject matter understandable while at the same time developing students' English language proficiency. This dual approach (i.e., content teaching that incorporates language development, typically referred to as *sheltered instruction*) and how best to implement it have been the research focus of the Center for Research on the Educational Achievement and Teaching of English Language Learners (CREATE). Sheltered instruction is becoming a more common approach in schools as the number of English learners in U.S. schools increases.

## Sheltered Instruction: Content and Language Teaching

Learning rigorous, standards-based subject matter can be challenging for many students, but it is particularly difficult for those students who are not yet proficient English speakers. Although these students learn in many of the same ways as English speakers, they benefit from adjustments made to instruction so that it is more understandable for them (August & Shanahan, 2010). Some of the features of instruction shown to be effective for enhancing learning for English learners include modeling, using multiple media to provide visual aids, providing repetition and additional practice, using students' background knowledge to make information meaning-

ful, highlighting and teaching key vocabulary, building on students' native language proficiency, and planning opportunities for students to interact with one another on text-based tasks.

Although many of these features involve the use of language, explicit attention to teaching *academic language* within content lessons is required for students to develop English proficiency. Academic language differs from conversational English in that it is more complex and it is not typically encountered in everyday settings. Effective teaching includes planned speaking practice in content classes so that students have both formal and informal practice using academic English (Guthrie & Ozgungor, 2002). Consistent opportunities for oral interaction around formal academic language can facilitate more specialized uses of the academic register of formal writing and speaking (Gibbons, 2003).

## Effective Sheltered Instruction in School Settings

While there exists a body of research on content and language teaching, the growth of the English learner population has outpaced research. As Coleman and Goldenberg (2012) state, "Although formal research to evaluate the effects of various sheltered strategies is ongoing, educators must help lead the way. There is simply no time to wait until researchers address all of the important issues regarding sheltered instruction" (p. 48). In that vein, this brief highlights two schools' successful efforts to improve the achievement of their students using the SIOP Model, one of the approaches that CREATE research studies have confirmed as being effective for teaching English learners.

Developed as an approach for integrating language development with content teaching, the SIOP Model offers teachers a model of instruction for planning and implementing effective lessons. It has been validated as a model of instruction that improves the achievement of students whose teachers use it (Echevarría, Richards-Tutor, Chinn, & Ratleff, 2011; Echevarría, Short, & Powers, 2006; Short, Fidelman, & Louguit, 2012). Its 8 components and 30 features provide a framework for lesson planning and for classroom observation. The eight components are Lesson Preparation, Building Background, Comprehensible Input, Strategies, Interaction, Practice & Application, Lesson Delivery, and Review & Assessment (see Echevarría, Vogt, & Short, 2013, for a comprehensive discussion). Each of the components is supported by empirical studies, and the model itself has a growing research base (Short, Echevarría, & Richards-Tutor, 2011).

## **Pasadena Memorial High School, Pasadena, Texas**

Pasadena Memorial High School, located in an urban area outside of Houston, has a total population of approximately 2,700 students, including a population of English learners whose number fluctuates between 160 and 180 students. Most of these students are Spanish speaking, but there are also students from Asian countries. Many of the school's English learners have been in the United States for 3 or more years, and typically about 30 students are recent immigrants (i.e., in the United States 3 years or less).

### ***Prior to SIOP Model Implementation***

Prior to the school's beginning SIOP implementation, the English as a Second Language (ESL) program was unfocused, mainly because there was only one ESL teacher who was responsible for meeting the needs of all English learners. English learners lagged behind their English-speaking peers in vocabulary and content knowledge, and their overall academic needs were not being met. The program lacked a plan for determining students' needs and how to address them.

In 2008-2009, the principal recognized that school-wide involvement in the education of the growing number of English learners was warranted. At that time, teachers had little knowledge of language development and how to deliver content effectively to students who were not native speakers of English. A commitment to professional development was made with the goal of improving state test scores, especially the scores of English learners.

### ***SIOP Training and Implementation***

It was decided that all teachers in the school would learn the SIOP Model, and to that end, they received SIOP professional development. District trainings introduced teachers to the components of the SIOP Model over the course of 3 days.

In addition, a SIOP peer facilitator was hired to assist teachers in implementing the SIOP Model at the school. To deepen teachers' understanding of the SIOP Model and facilitate effective implementation, a campus SIOP team of 28 teachers was selected. Teachers recommended for the team were considered to be among the strongest in their respective content areas (English language arts, science, math, and social studies) and at their grade levels. These teachers had designated SIOP classes that included English learners.

In the first 2 years (2009-2010 and 2010-2011), the SIOP facilitator met with SIOP teachers every 3 weeks during their conference period and focused on one SIOP component every 12 weeks (two 6-week periods). In the first year of SIOP implementation, the components covered were Lesson Preparation (with a focus on writing content and language objectives), Building Background, Comprehensible Input, and Interaction. Components covered in the second year were Strategies, Practice & Application, Lesson Delivery, and Review & Assessment. During meetings, teachers received training in the features of the component, and activities for the targeted component were modeled so that the teachers could try them in their classrooms. Content area SIOP team teachers planned lessons collaboratively during their additional conference period. The SIOP facilitator would meet with newer teachers who required more support every 2 weeks.

In addition to conference period meetings, formal walk-through observations were conducted by the site coach, the assistant principal, and district instructional ESL specialists. Observers visited classes for 5 to 10 minutes at a time and used the SIOP protocol to see which components were visible. The focus was on observing the level of implementation of the targeted components. Walk-throughs were sometimes unannounced; at other times teachers requested an observation when they were doing something they wanted the coach to see. Usually, there was an informal discussion following the walk-through between the coach and teacher. Over 80 walk-throughs were conducted each year.

After the first year, SIOP components were selected for deeper study and implementation based on what was

observed during walk-throughs. For example, if there was little interaction observed in SIOP classrooms, the Interaction component would be the focus of the next meeting and subsequent observations.

**SIOP Model Results**

English learners’ results on the Texas Assessment of Knowledge and Skills (TAKS), the required state standardized assessment system, are presented in Table 1. The percentage of English learners who passed the assessment in all content areas has increased steadily since the SIOP Model was introduced in 2008-2009.

In addition, the 2011-2012 language acquisition assessment scores revealed that students at Pasadena Memorial High School made significant progress in acquiring English. The school was the highest ranked high school in the district, with 65% of their limited-English-proficient population making progress. “I think this speaks to the commitment SIOP teachers have in helping students acquire the language,” says the school’s SIOP peer facilitator. “Overall, having teachers understand the language development process of the students has been very helpful. Teachers hold students to higher standards because the teachers see that the students can do way more than they thought they could.”

**Table 1. TAKS Results: Percentage of English Learners Passing**

Content area	2009	2010	2011
English language arts	43.43%	56.50%	76.60%
Science	30.76%	43.47%	53.00%
Math	29.29%	41.73%	62.00%
Social studies	64.81%	78.26%	86.25%

**Other Factors of Success**  
**Restructured ESL program**

At the same time that SIOP implementation began, a course plan was developed for students in the ESL program. In year 1, English learners took a language acquisition class whose focus was to develop conversational English. They also took a course on reading in content areas and an English course for ESL students. In years 2 and 3, students took a writing course, a reading in the content area course, and an English course.

**Monitoring of Academic Performance**

Previously, the school’s one ESL teacher had not had time or resources to adequately monitor the academic progress of English learners. In 2009-2010, the SIOP peer facilitator and district ESL specialists began monitoring English learner progress by obtaining failure reports on English learners every 3 weeks. At each 6-week grading period, the SIOP peer facilitator assessed the failure reports and assigned a SIOP instructional aide to assist in the class with the most English learners in jeopardy of failing the course. The aide supported instruction and provided linguistic accommodations for students. The SIOP peer facilitator also assisted teachers by calling parents when teachers requested and keeping parents informed about their child’s academic achievement. When multiple requests were made about a particular student, the SIOP peer facilitator set up a parent-teacher conference with the student’s family.

**Tiffany Park Elementary, Renton, Washington**

Located outside of Seattle, Washington, in the urban community of Renton, Tiffany Park Elementary identifies 27% of its student population as English learners. The English learner population includes speakers of Ukrainian, Russian, Spanish, Somali, Vietnamese, and 15 other languages.

**Prior to SIOP Model Implementation**

Tiffany Park’s English learners had consistently underperformed in reading and mathematics on the state’s assessment, the Washington Assessment of Student Learning, with only 26% of English learners at the school meeting standards. The number of low-income students who met standards was also low, as shown in Table 2.

**Table 2. State Reading Assessment Results by Grade Level: Percentage of Students Meeting Standards (2006-2007)**

Grade	All students	Low-income students	Limited-English-proficient students
Grade 3	60.3%	44.7%	26.3%
Grade 4	71%	63.9%	27.3%
Grade 5	73.4%	58.8%	30.0%



Prior to the school's adopting the SIOP Model, Tiffany Park's ESL program was a pull-out program in which all eligible students were pulled out of their general education classrooms to work on language acquisition skills with either an ESL-endorsed teacher or a paraeducator. There was little connection between the instructional program in the ESL classroom and the general education classroom. Classroom teachers reported frustration with the ESL pull-out schedule and its impact on their ability to consistently provide core content instruction to English learners.

In 2005-2006, the new principal of Tiffany Park, a former English learner herself, determined that a new approach was needed to support greater academic achievement for English learners and low income students.

### ***SIOP Training and Implementation***

During the 2007-2008 school year, teachers at Tiffany Park participated in a 3-day SIOP Model training. All instructional staff participated, except for first-year teachers. In subsequent years, any staff members who had not been trained (i.e., the previous year's first-year teachers and teachers new to the building) also participated in a 3-day training.

The principal considered the first year of implementation a practice year in which teachers would try out components of the SIOP Model. However, she required teachers to have content and language objectives posted in their classrooms for all mathematics lessons. Most teachers also began using content and language objectives in all subject areas. After the initial training, the school's instructional coach and ESL teacher participated in a 2-day SIOP training focused specifically on coaching and implementation. They subsequently began working with those grade-level teams who wanted to increase their skill and implementation of the model.

In each consecutive year, the principal increased expectations for SIOP implementation, for example, by requiring the posting of content and language objectives in reading, mathematics, and science. She also provided the opportunity for staff to continue to deepen their knowledge of the SIOP Model through periodic component enrichment sessions in which the entire staff focused on one component (e.g., Review & Assessment or Lesson Preparation) during 90-minute staff development sessions.

The SIOP Model was included in Tiffany Park's school improvement plan as an instructional approach for improving the reading and mathematics achievement of all students, and also as an equity and access strategy for low-income students and English learners. Because Tiffany Park had a fairly high transition or ESL exit rate (nearly 25% of English learners in 2010-2011 were transitioned to English proficient status), those mainstream students who were former English learners continued to benefit from the kinds of instructional supports provided by SIOP teaching. Thus, the results for all students at Tiffany Park Elementary are reported along with students identified as low income and English learners.

### ***SIOP Model Results***

Washington State assessment results for Tiffany Park Elementary showed an overall increase in scores in 2010-2011 on reading, writing, mathematics, and science assessments (Table 3). Noteworthy improvements included fifth-grade increases of nearly 24 percentage points in science and nearly 26 percentage points in math.

In 2010-2011, Tiffany Park's average scores for English learners surpassed the overall average scores for the state on both the reading and mathematics assessments. Only 27% of Washington state's English learners

**Table 3. State Reading Assessment Results by Grade Level: Percentage of Students Meeting Standards in 2010-2011 and Their Increase Since 2006-2007**

Grade	All students	Increase from 2006-2007	Low-income students	Increase from 2006-2007	Limited-English-proficient students	Increase from 2006-2007
Grade 3	74.7%	+14.4	61.7%	+17	40%	+13.7
Grade 4	75%	+4	67.3%	+3.4	66.7%	+39.4
Grade 5	80%	+6.6	72.1%	+13.3	40%	+10



met standards on the reading assessment, but 47% of Tiffany Park's English learners met reading standards. In mathematics, only 24% of Washington state's English learners met standards compared with 38% of Tiffany Park's English learners.

In recognition of the school's achievement on state tests, Tiffany Park Elementary received the Washington State Overall Excellence Award in 2011, placing it in the top 5% of all elementary schools statewide.

### **Other Factors of Success**

The factors described below, coupled with fidelity to the SIOP Model, contributed to Tiffany Park's success.

#### **Delayed-Start Fridays**

In 2007-2008, Renton School District implemented delayed-start Fridays, providing teachers with the opportunity to work in professional learning communities weekly. Once a month during this time, Tiffany Park's principal held professional development sessions such as SIOP component enrichment, which provided teachers with additional support in SIOP implementation.

#### **Classroom Walk-Throughs**

From 2008 to 2010, Tiffany Park was part of a state-wide improvement initiative that included an instructional framework, extensive professional development, and classroom walk-throughs. Each building at Tiffany Park had walk-through goals, which resulted in opening the doors of classrooms in a way that had not been done previously. The "open-door policy" created by the walk-throughs provided access to instruction, which helped ensure that high-quality SIOP teaching was being implemented in classrooms.

#### **Ongoing SIOP Support**

In 2011-2012, the district began providing a stipend to two SIOP lead teachers at Tiffany Park for providing additional SIOP support to their colleagues. The lead teachers participated in a 1-day SIOP training on peer coaching, and they met together each quarter to plan and discuss ways to support teachers. The lead teachers also set up demonstration classrooms, observed other teachers and provided constructive feedback, provided mini-reviews of specific SIOP features for teachers at staff meetings, participated in lesson design study with grade-level teams, and helped sustain the staff's SIOP teaching efforts.

#### **Modified ESL Program**

The ESL director modified the ESL program so that it was more purposeful and of time-limited duration. The content of pull-out group lessons was focused on a

specific skill, such as writing a good paragraph. Students in an ESL group were pulled out for 4 to 6 weeks rather than the entire school year. Also, students were no longer pulled from their classrooms during the times that core content was being taught.

## **Conclusion**

The integration of content and language teaching is critical for English learners to develop the academic skills necessary to be successful in meeting high standards. However, teaching must be adapted for these students to access grade-level content material and to develop the specific academic language required in school settings. The SIOP Model is most successfully implemented by teachers who have the support of their administration and other teachers in the building. This support is achieved when the model is adopted as a school-wide initiative. Based on the experience of the two schools featured here, ongoing professional development and fidelity to the research-validated SIOP Model of instruction had a positive impact on student achievement.

## **References**

- August, D., & Shanahan, D. (2010). Effective English literacy instruction for English learners. In *Improving education for English learners: Research-based approaches* (pp. 209–249). Sacramento: California Department of Education.
- Brisk, M. (2010). Learning English as a second language. In M. Shatz & L. C. Wilkinson (Eds.), *The education of English language learners: Research to practice* (pp. 152–173). New York: Guilford Press.
- Coleman, R., & Goldenberg, C. (2012). The common core challenge for English language learners. *Principal Leadership*, pp. 46-51.
- Echevarría, J., Richards-Tutor, C., Chinn, V., & Ratleff, P. (2011). Did they get it? The role of fidelity in teaching English learners. *Journal of Adolescent and Adult Literacy*, 54(6), 425–434.
- Echevarría, J., Short, D., & Powers, K. (2006). School reform and standards-based education: An instructional model for English language learners. *Journal of Educational Research*, 99(4), 195–210.
- Echevarría, J., Vogt, M. E., & Short, D. (2013). *Making content comprehensible for English learners: The SIOP® Model* (4th ed.). Boston, MA: Allyn & Bacon.
- Gibbons, P. (2003). Mediating language learning: Teacher interactions with ESL students in a content-based classroom. *TESOL Quarterly*, 37(2), 247–273.

Guthrie, J. T., & Ozgungor, S. (2002). Instructional contexts for reading engagement. In C. C. Block & M. Pressley (Eds.), *Comprehension instruction: Research-based best practices* (pp. 275–288). New York: Guilford Press.

Short, D., Echevarría, J., & Richards-Tutor, C. (2011). Research on academic literacy development in sheltered instruction classrooms. *Language Teaching Research*, 15(3), 363–380

Short, D., Fidelman, C., & Louguit, M. (2012). Developing academic language in English language learners through sheltered instruction. *TESOL Quarterly*, 46(2), 333–360.



CREATE, the Center for Research on the Educational Achievement and Teaching of English Language Learners, is conducting a program of research designed to address the critical challenge of improving educational outcomes for English language learners in the middle grades by

- Enhancing the empirical research base for readers in Grades 4–8
- Using both narrative and expository text to develop and test effective interventions that promote content knowledge and language and literacy development
- Investigating the features of instruction and text modifications that facilitate learning for English learners (e.g., traditional instruction vs. ESL-enhanced instruction, teacher-guided instruction vs. group work, traditional text vs. modified text)
- Designing, testing, and delivering professional development that ensures that teachers implement effective classroom practices to help English learners achieve high standards

**For more information, visit the CREATE Web site**  
**[www.cal.org/create](http://www.cal.org/create)**


The Center for Research on the Educational Achievement and Teaching of English Language Learners (CREATE) conducts a program of research designed to address specific challenges in the education of English language learners in Grades 4–8. CREATE is a partnership of researchers from six institutions:

- Texas Institute for Measurement, Evaluation, and Statistics, University of Houston
- Harvard University
- California State University, Long Beach
- University of California-Berkeley
- Center for Applied Linguistics
- Vaughn Gross Center, University of Texas at Austin

This brief was produced by CREATE with funding from the U.S. Department of Education (ED), Institute of Education Sciences, under Contract No. ED-R305A05056. The opinions expressed in this report do not necessarily reflect the positions or policies of ED. This document is in the public domain and may be reproduced without permission.

*This page intentionally left blank.*

Browse the CREATE website for more information about the research project and available resources.



Google Site Search Go

Research

Events

News


Resources

- Presentations
- Publications
- Related Web Sites


About CREATE

Partners

CREATE is a program of research conducted by



Texas Institute for Measurement, Evaluation, and Statistics, University of Houston




California State University, Long Beach



Center for Applied Linguistics




Harvard Graduate School of Education



The Meadows Center for Preventing Educational Risk




University of California, Berkeley



Vaughn Gross Center for Reading and Language Arts, The University of Texas at Austin

CREATE's work is funded by a grant from



NATIONAL CENTER FOR EDUCATION RESEARCH  
Institute of Education Sciences

Learn more about National Research and Development Centers.

The National Center for Research on the Educational Achievement and Teaching of English Language Learners  
A research program funded by the Institute of Education Sciences, U.S. Department of Education

### CREATE Briefs

CREATE briefs provide a closer look at the topics of CREATE's research. They address current issues that are relevant to practitioners and other education professionals.

---

***The SIOP Model: A Professional Development Framework for a Comprehensive School-Wide Intervention***

This brief first describes individual interventions that CREATE researchers tested in middle school science, social studies, and language arts classrooms with English language learners over the course of the 2005-2009 school years. The brief then explains how the SIOP Model was used as a professional development framework to unite the separate research studies into a school-wide, comprehensive intervention that was implemented in the 2009-2010 and 2010-2011 school years to support English language learners across the core content areas.

[Read the brief online](#) or [download the PDF](#)

---

***Improving Reading Across Subject Areas With Word Generation***

This brief describes a quasi-experimental study of Word Generation, conducted in public middle schools in Boston. Word Generation is a robust vocabulary intervention that is implemented across key subject areas. The purpose of the program is to enhance students' vocabulary in support of improved reading comprehension. The brief outlines the details of the intervention and explains how it increases the vocabulary development of all students, including English language learners.

[Read the brief online](#) or [download the PDF](#)

---

***Effective Social Studies Instruction to Promote the Knowledge Acquisition and Vocabulary Learning of English Language Learners in the Middle Grades***

This brief explains a CREATE intervention that incorporates literacy and language development activities into social studies instruction. It describes lessons designed to increase English language learners' social studies knowledge while simultaneously improving their vocabulary acquisition and overall reading comprehension.

[Read the brief online](#) or [download the PDF](#)

---

***Improving Science and Vocabulary Learning of English Language Learners***

This brief reviews previous research related to the development of science knowledge and academic language in English language learners as well as the role of English language proficiency, learning in a second language, and first language knowledge in science learning. It also describes two successful CREATE interventions that build academic and discipline-specific vocabulary and science knowledge in English language learners.

[Read the brief online](#) or [download the PDF](#).

---

***Response to Intervention and English Learners***

Response to Intervention (RTI) has emerged as a method for providing early academic assistance to students with difficulty learning. This brief outlines the tiered structure of RTI and how it can be implemented as an effective technique for teaching English learners who are having difficulty making academic progress. It touches on methods of assessment and instructional considerations, and it guides educators in tailoring this technique to fit the needs of English learners.

[Read the brief online](#) or [download the PDF](#).

---

***Using the SIOP Model to Improve Middle School Science Instruction***

This brief provides an overview of the SIOP Model and highlights how teachers can develop content and language objectives, emphasize key vocabulary, promote interaction, and incorporate effective review and assessment techniques within the context of middle school science. It provides research-based examples and strategies in order to illustrate how teachers can plan for the successful integration of content and language in science lessons.

[Read the brief online](#) or [download the PDF](#).

[www.cal.org/create](http://www.cal.org/create)

