Research Overview

The Impact of the SIOP Model on Middle School Science and Language Learning

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The overall academic performance of English language learners (ELLs) in U.S. schools is problematic with a dramatic, lingering divide in achievement between Caucasian students and those from culturally and linguistically diverse groups (California Dept. of Education, 2004; Siegel, 2002; Snow & Biancarosa, 2004). Part of the reason for the achievement gap is that many teachers are underprepared to make content comprehensible to ELLs who are not proficient in the language of instruction (i.e., English). In addition, ELLs are asked to demonstrate their content area knowledge on high stakes tests, such as those for the No Child Left Behind requirements, before they are proficient. ELLs have been tested in mathematics and reading; and in 2006-07, tests in science will be added to the battery of assessments they must take.

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

The SIOP Model shares many features recommended for high quality instruction for all students, such as cooperative learning, reading comprehension strategies, and differentiated instruction. However, the model adds key features for the academic success of ELLs, such as including language objectives in every content lesson, developing background knowledge and content-related vocabulary, and emphasizing academic literacy practice. It allows for some variation in classroom implementation while at the same time 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).

"The Impact of the SIOP Model on Middle School Science and Language Learning" is a 5-year study evaluating the effectiveness of the SIOP Model. Funded by the U.S. Department of Education, Institute of Educational Sciences under the Center for Research on the Educational Achievement and Teaching of English Language Learners (CREATE), this study will investigate the impact of the SIOP Model on student academic achievement in science, a subject area with high language demands. We plan to scale up the research to multiple sites across the U.S. in a series of controlled, randomized studies.

Research Questions
1. *What are the effects of the SIOP Model of sheltered instruction on academic language and concept comprehension among English language learners in middle school science classrooms?*
2. *What are the effects of an integrated SIOP Model of sheltered instruction (that incorporates findings from other Center studies on reading strategies, language development and text modification) on academic language and concept comprehension among English language learners in middle school science classrooms?*

Research Design and Intervention

In Year 1, we developed and pilot-tested SIOP Model lesson plans for Grade 7 curriculum units and related assessments that focused on the acquisition of science concepts and the development of academic language among English language learners. The results of this pilot study were used in our Year 2 study as we trained eight science teachers in the SIOP Model and provided them with SIOP science curriculum units so that they would implement the lesson plans effectively. Control teachers (a total of 4) taught the same science curriculum in their usual manner. Then we tested intervention and control student performance on the assessments and compared the results of students in the SIOP classes to those of control students. There were 649 students in the SIOP classes and 372 students in control classes.

In Year 4 we will expand the study with Treatment 1, Treatment 2, and Control groups in a different district. Treatment 1 teachers will receive SIOP training plus the SIOP science units. Treatment 2 will receive only SIOP training. Control teachers will teach the curriculum as they usually do. As in Year 2, we will test the intervention and control student performance on the assessments and compare the results of the three groups of students.

It is anticipated that the data gathered from Years 2-4 will be combined with the research findings from other CREATE research studies and will ultimately coalesce into a successful school reform intervention for English language learners that will be tested in a randomized study in Year 5.

The SIOP Model is currently being implemented in school districts and used in university teacher preparation programs in nearly all 50 states around the U.S. However, the implementation of the SIOP Model has outpaced the research on its features. This current study's integration of professional development and curriculum design aligned to state science and language standards is the type of research-based approach that U.S school districts are seeking to help English language learners develop academic content and language proficiency. For more information regarding the study go to: http://www.cal.org/projects/create.html

References

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