Research Overview

Project QuEST: Quality English and Science Teaching

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A recent review (Snow & Biancarosa, 2004) found a variety of programs designed to address the needs of adolescent struggling readers, but none were specifically designed to address the learning challenges of English-language learners. According to the authors, "the general working assumption in teaching adolescent literacy has been that all struggling readers have the same sorts of problems; this assumption may be valid, but it seems that some subsets of English-language learners bring unique problems and unique strengths to the task of learning to read in English. Additionally, there is virtually no research on effective science interventions for students at the middle grades level who are English-language learners.

The overarching goal of the study is to build the science knowledge and skills of English-language learners and their fluent-English-speaking peers and concurrently enhance their language and literacy development. This study is a key research strand for the new federally-funded National Research and Development Center on English Language Learners, CREATE, the only federally-funded center to focus exclusively on English-language learners. Additional information about the Center and Project QuEST is located on the Center's website: http://www.cal.org/create/index.html.

An overriding principle in our research is the notion that the interventions that we are testing must be effective for English-language learners, but must not disadvantage fluent English speakers. Because in the middle school and upper elementary grades, fluent English-speaking students and English-language learners are most often together in the same classrooms, we plan to incorporate both English-language learners and fluent English-speaking students in our study designs and to test explicitly for interactions of language status with experimental and traditional forms of instruction. If interventions that have not been developed for English-language learners have a negative impact on these students, then teachers and schools face a hidden cost of implementing these interventions in schools where classrooms are mixed, and these costs must be made clear. On the other hand, it is critical to determine how interventions designed for English-language learners affect fluent English-speaking students. It may be that ESL/science enhanced versions of the curriculum benefit all students, regardless of language proficiency. Our research studies will be designed to answer these important questions.

1. *What are the effects of Project QuEST on the English literacy development and science knowledge of English-language learners and fluent-English speakers?*
2. *Are the effects different for English-learners with differing levels of second-language proficiency?*
3. *What attributes of the curriculum are especially effective in building students' science knowledge? Which attributes are especially effective for building students' language and literacy skills? Do the attributes differ for students with different levels of English proficiency?*

Research Design and Intervention

In the first year of the project, we developed and pilot-tested the Project QuEST curriculum with six upper elementary school teachers in Arlington, Virginia. Findings from the pilot work were used to revise the curriculum which was implemented in 10 sixth grade science classrooms in Brownsville, Texas. The Quest curriculum that was implemented was aligned with the Texas state standards, taught the same content as is taught during sixth grade science in Brownsville, and used the same text book and auxiliary materials that are used in the regular classrooms. However, the Quest curriculum incorporates additional elements including hands-

on science activities to build conceptual knowledge, systematic vocabulary instruction to build academic and technical word knowledge, and guided reading to expose students to academic language. The program is guided by research on effective science teaching (Guthrie et al., 2004) and effective methods of building language and literacy in the context of content-area instruction (August & Shanahan, 2006).

The sample of students included English-language learners, former English-language learners, and fluent English-speaking students. Teachers who participated in QUEST taught two science classes as they currently do and two science classes using the QUEST materials and strategies. Random assignment was used to determine which classes were taught as usual and which classes were taught as QUEST classes. All sixth grade students were assessed for language and literacy skills using the GRADE and for science content aligned with the curriculum using a researcher-developed measure. Data is currently being analyzed.

Based on numerous site visits, and ongoing conversations with teachers, the QuEST curriculum was revised again and during the third year of the study will be implemented in 20 sixth grade classrooms in Brownsville. The challenge is to use grade-level materials, but make the content accessible to all students. The science topics that will be covered include Space, Force and Motion, and Living Systems.

References

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