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Research Title:

Project ACCESS: Acquisition of Curricular Content for Exceptional Success in Science

Abstract of Proposed Plan of Research:

“Language is a major barrier (if not the major barrier) to most students learning in science” (Wellington and Osborn, 2001, p. 2) and this barrier can be greater for students whose first language is not English. However, there is a body of literature drawing from culturally relevant pedagogy and bilingual education supporting the idea that language, culture, and personal experience of all students, including English Language Learners (ELLs), are sources of capital that can promote learning the “language of science” (see, for example, Buxton & Lee, 2010). Thus, the challenge is how to leverage students’ cultural and linguistic capital to improve learning in science. Meeting this challenge will shift views of students who struggle to learn the language of science from a deficit to asset perspective. One way to address this challenge is the focus of this study: the transformation of existing science curricula that includes leveraging cultural and linguistic capital to learn science vocabulary, including Hispanic students whose first language is not English. If we can improve science curriculum for K-12 students, then we as educators are better preparing them for their undergraduate education.

This proposal seeks to address the need for a more inclusive science curriculum that will better prepare Latina/o students, including students whose 1st language is Spanish, for postsecondary success in science. We will focus our intervention on learning in high school science classrooms. The proposed study will continue to develop, implement, and test curricula that helps students better learn science using multiple vocabulary strategies (MVS) to develop a deeper meaning of critical science terms. The MVS model has transformative potential to help both science teachers and students in their classroom improve their learning of science, including helping bilingual and ELL students access their knowledge of Spanish as a form of linguistic capital. While the focus is on student learning in high school science classrooms, the proposal is also designed to enhance preservice (undergraduates) and in-service science teachers’ pedagogical content knowledge (PCK) and attitude toward teaching.