Project QUEST
National Science Foundation
DRK-12 Discovery Research Grant
Impact Report

Loyola Marymount University
Center for Equity for English Learners
Center for Urban Resilience

Title: Project QUEST *(Quality Urban Ecology Science Teaching)* for Long Term English Learners (LTELs)

Project QUEST (***Q**uality **U**rban **E**cology **S**cience **T**eaching*) for Long Term English Learners (LTELs) was implemented through a tripartite collaboration across two centers at Loyola Marymount University -- the Center for Equity for English Learners (CEEL) and the Center for Urban Resilience (CURes), and the Los Angeles Unified School District --Ellen Ochoa Learning Center (K-8). This transdisciplinary effort resulted in the creation of Resources, Models and Tools to increase the quantity and quality of science instruction. The primary goal of this project was to increase LTELs' science achievement and engagement in: (1) Urban Ecology, and (2) scientific disciplinary academic language skills to expand awareness of STEM related careers.

Project QUEST's impact is significant given that little or no research exists on STEM and this specific subpopulation of English Learners (LTELs). This project focused on interdisciplinary teaching and learning for 4th- 8th grade LTELs and represented one of the last opportunities for this significantly underserved population of students to exit EL status, attain greater access and exposure to STEM, and college and career readiness prior to entering high school. Additionally, QUEST generated new knowledge about improving LTEL's STEM skills and achievement while documenting the development of their teachers' knowledge and skills in delivering high quality STEM education for this population.

DEVELOPMENT OF RESOURCES, MODELS AND TOOLS OUTCOMES
The outcomes of this project included the development of RMTs (resources, models and tools) to impact the quantity and quality of LTELs' science language and literacy achievement as a result of their teachers' participation in QUEST professional learning.

Resources: The CEEL and CURes teams, with a curriculum committee, developed and enhanced two Urban Ecology for English Learner curriculum resources. These standards-based, upper elementary/middle school modules are designed to bolster English language and literacy learning by providing access to rigorous STEM content. The curriculum emphasizes locally relevant field studies and are multiply aligned with cross-disciplinary Next Generation Science Standards (NGSS), Common Core English Language Arts (ELA) standards, and the California English Language Development (ELD) standards. *Module 1: Introduction to Urban Ecology* and

Module 2: Patterns of Urban Land Use each include 6 instructional units with over 22 lessons that develop inquiry-based integrated English language and science emphasizing expository/informational writing and oral language development.

Model: The QUEST Transdisciplinary Framework for Urban Ecology for ELs was refined throughout the project. It was the basis for curriculum development and professional learning experiences.

Tools for Collection of Data (Students and Teachers): Five assessment tools were developed for teachers and students: a) Teacher Assessment Survey; b) Writing Rubric; c) Public Service Announcement (PSA) Rubric; d) EL STEM Career Awareness Inventory; e) QUEST Science Literacy for Urban Ecology Assessment; and f) Land-Use Project Rubric. Tools were developed, piloted, and examined for viability of content and use.

TEACHER PROFESSIONAL LEARNING OUTCOMES

Project QUEST engaged 14 educators and 1 site coordinator representing cross-disciplinary teams of grade 4–8 teachers of English Learners (Science, ELA, ELD, Resource Support, and History/Social Studies). Professional learning sessions included annual 3-day summer institutes coupled with 3 to 4, three-hour follow-up sessions throughout the year. Collaborative learning agendas included the delivery of simultaneous science, language, literacy and inquiry-based content focused on research-based practices for teaching, learning and assessment for ELs.

This project affirmed the efficacy of an integrated professional development model focused on STEM literacies for LTELs. In Year 1, the majority of teachers rated themselves as Novice, or Non-users of transdisciplinary teaching and learning curriculum modules. By the second year, many teachers rated themselves as Intermediate-users with some Novice and Advanced users. Almost all teachers participating in Year 3 assessed themselves as Intermediate-users, with one person in the Advanced-user Category. In an extension year of the project, six

teachers emerged as leaders, developed supplemental resources, and led Urban Ecology field experiences during field trips to local wetlands.

Project teachers and the site-level coordinator were an integral part of the development of the Transdisciplinary curriculum modules. They provided feedback on the modules' content, sequence, and standards alignment. On-going professional learning sessions allowed for cross-disciplinary collaboration and discussion of approaches to assist teachers in maximizing opportunities to increase instructional time in science and to support students in conducting scientific research.

By the end of the project, teachers reported high levels of knowledge and skills in developing science content, language and literacy learning for ELs. They rated their instructional practices related to research-based practices in these areas on a 5-point scale. Their overall mean rating was 4.1.

STUDENT LANGUAGE AND ACADEMIC GROWTH OUTCOMES

Project QUEST showed significant learning outcomes for students' career awareness and in English language development, writing and academic achievement. In Year 1, 426 students in grades 4-7 participated in QUEST Module 1 instruction. During the subsequent year, 288 students participated in QUEST Module 2. In an extension year, 120 students participated in several urban ecology enrichment sessions and one field trip.

Over the course of the project, a large number of students reclassified from EL status to fluent-English proficient (RFEP). A total of 103 students assessed at the beginning of the project as ELs had language classification records in Years 2 and 3. End-of-project results indicated that 73% (n=75) were reclassified as RFEP; 27% (n=28) remained ELs, with 46% (n=13) of these receiving special education services.

EL students' progress on ELA state-level academic achievement assessments indicates that from pre to post-project, the number of students in the EL/RFEP group who scored at the "Standard Not Met" Performance Level *decreased by 25%.* Those who scored at the "Standard Nearly Met" level *increased by 21%* and those who scored at the "Standard Met/Exceeded" Performance Levels *increased by 4%.* Project writing assessments showed statistically significant differences in scores related to development of informational text structure, academic discourse, spelling/grammar, and metacognition/metalinguistic awareness.

Project QUEST also contributed to systemic efforts to model, influence, and study how members of transdisciplinary communities engage in and benefit from the development and implementation of RMTs that have the potential to positively affect educational outcomes for ELs. The nature of Project QUEST places science in the social context where the scientific tools of investigation methodology become a general life pattern for students to learn to see data as an empowering tool as they achieve legitimacy and access within their social milieu.

For more information contact ceel@lmu.edu – (310) 568-6117