

RESEARCH BRIEF



TEXAS A&M UNIVERSITY Center for Research & Development in Dual Language & Literacy Acquisition



TEXAS A&M UNIVERSITY Education Leadership Research Center



Project Literacy Infused Science using Technology Innovation Opportunities (LISTO)

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Overview

Project Literacy Infused Science using Technology Innovation Opportunities (LISTO) is a longitudinal randomized control trial validation study of science teaching and learning with middle-grade students across rural and non-rural districts in Texas. LISTO is a five-year study designed to improve students' science and reading and writing literacy achievement by working with teachers and administrators to build instructional capacity. LISTO objectives include the following:

- determine the extent to which literacy-infused science (LIS) and technology innovation components, when implemented over 25 weeks, impacts 5th-grade student growth in science, reading, and writing; and
- determine differences between treatment (intervention) and control (typical practice) groups

Project LISTO incorporates multiple innovative approaches to support literacy in science instruction and professional development for science teachers who serve English learners and students experiencing economic challenges. The project is expected to serve more than 100 teachers, 45 administrators, and 10,000 high-need students.

Figure 1: LISTO participant breakdown by condition







Figure 2: School level science STAAR results after two years of LISTO intervention







For more information about STAAR performance level descriptors please visit https://tea.texas.gov/sites/default/files/PLD_G5%20Science_April%202019.pdf

After two years' participating in the Project LISTO, treatment teachers better supported their students in all three State of Texas Assessments of Academic Readiness (STAAR) performance standards: approaches, meets, and masters grade level - as reported by campus-level scores. Treatment teachers increased the percentage of students approaching (3%1), meeting (7%1), and mastering (5%1) from 2017 (before LISTO) to 2019 (two years in LISTO), while control teachers have a 4% decrease, a 6% increase, and a 2% increase in three standards, respectively. It is worth noting, while treatment schools have a higher percentage of students classified as English learners and economically challenged students, with two years' participation of the LISTO PD, treatment teachers better supported their students to reach two higher performance levels, meeting and mastering grade level.

Components of Project LISTO

Literacy-Infused Science Curriculum (LIS)

Project LISTO is organized around a 25-week literacy-infused 5th-grade TEKS-aligned science curriculum. Literacy-infusion innovations include designed opportunities for evidence-based speaking, reading, and writing activities strategically organized into a daily 80-minute science curriculum. When implemented with fidelity, the literacy-infusion innovations yielded student academic gains in 5th-grade science, reading, and writing.

- Standards-aligned science curriculum with integrated literacy (explicit vocabulary instruction, strategic partner reading of expository text, listening, speaking, reading, writing)
- Incorporates 5E model (Engage, Explore, Explain, Elaborate, Evaluate)
- Units framed with scenarios, science careers, and final challenge
- Promotes student use of technology (tablets, science software)
- Includes 'maker' opportunities
- Supports 21st-century entrepreneurial skills

Virtual Professional Development (VPD)

Project LISTO provided fifth-grade science teachers with bi-weekly virtual professional development (VPD). The sessions focused on instructional strategies, building teaching capacity, previewing and modeling upcoming lessons, and reflecting on student and teacher learning.

During the first year of intervention, PD facilitators used Citrix GoToTraining and Google slides to present content. Initially, facilitators selectively posed open-ended questions, provided participants time to think, and then invited the participants to respond either through a chat box or open microphone. The coordinators integrated sentence stems as scaffolds, as well as random name generators to provide as many participants the opportunity to contribute to the conversation.

During the second year of implementation, the PD facilitators used Citrix GoToTraining and Nearpod as delivery mechanisms to increase the level of engagement among participants. Nearpod is a student engagement platform that provides participants with the opportunity to actively engage with a variety of embedded activities. These include openended questions, polls, multiple choice quizzes, collaborate boards, and drawing activities. By providing teachers with interactive opportunities it allowed them to control the level of their engagement within VPD.

LISTO Participants were asked about the benefits of VPD and reported the following:

- "Virtual training is time effective."
- "It was convenient because I could do it from my school, car, or home!"
- "Benefits are the support needed to implement LISTO program with fidelity. Virtual support for teachers from coaches, staff, and instruction support. This program benefits my school, me as a teacher, and my students in my classroom."

Virtual Mentoring and Coaching (VMC)

Virtual mentoring and coaching (VMC) utilize the Applied Pedagogical Education Xtra Imaging System (APEXIS) hardware platform and Hoot Education to conduct coaching and mentoring sessions throughout the school year. A trained coach uses APEXIS to virtually observe the teacher's instruction and offer support and immediate feedback through a bluetooth headset. VMC not only offers support to teachers but the ability to increase the fidelity of curriculum implementation. Following a VMC session teachers complete feedback based on

reflection of their own instruction.

LISTO Participants were asked about the benefits of VMC and reported the following:

• "I have difficulty in the teaching process because of my bilingual kids. They have a hard time trying to understand the concept, even if I repeated and I read it. [The coach] came up with a different way to expose the idea to the kid. Just talking to me on the ear and just show him this and yeah actually the kid finally got it."







Scientists as Role Models and Mentors (SRM2)

Scientists as Role Models and Mentors (SRM2) connects university science majors as mentors to 5th-grade students in efforts to motivate and engage students in areas of science, technology, engineering, and math. University science mentors share their science interests and experiences as related aligned science concepts and respond to student-generated questions. Enhancing SRM2 virtual interactions is a primary goal, including conducting synchronous virtual sessions between scientists and students.

Family Involvement in Science (FIS)

Family Involvement in Science (FIS) is an exploratory component of Project LISTO which includes take-home literacy-infused science booklets (English and Spanish) and a pair of video-recording glasses. Consented students continue to exercise literacy-infusion innovations as they participate in low-cost or no-cost hands-on science activities with their family members outside their school environment. Paired video-recordings are screened and analyzed for further analysis.

LISTO Parents participating in FIS reported the following:

- "It was a fun and easy project to do with my family."
- "Even I learned something."
- "Doing these activities showed me and my family new things."
- "Sí, porque así toda la familia aprendemos más con los hijos."
- "This interactive was very engaging and many people will be more willing to participate in it instead of doing just a worksheet.



LISTO-Virsity

LISTO-Virsity is defined as a Massive Open Online Professional Informal Individual Learning (MOOPIL) in which teachers will be able to access just-in-time PD online using Canvas as the online learning platform. Through the different PD offered, teachers are able to build their instructional capacity in classroom management, science, technology engineering, and mathematics topics. LISTO-Virsity PDs are developed and supported by Aggie STEM, CRDLLA, and ELRC.



For More Information

This information reflects the first two years of Project LISTO implementation. The project staff are currently analyzing year three as we prepare for the fourth year of implementation. For more information please visit crdlla.tamu.edu/LISTO/.