## *University of Arkansas at Little Rock – UALR K-4 Science Integration MSP Project*

The UALR K-4 Integration MSP Project is a partnership between the University of Arkansas at Little Rock (UALR) and Bale, Booker Arts Magnet, and Pulaski Heights Elementary in the Little Rock School District (LRSD) and Pulaski Academy (PA), and Little Rock Christian Academy (LRCA) to train 30 K-4 teachers in the AR K-4 Science Standards and the integration of that content. Science content and projects emerge from literature books and align with the AR Literacy and Mathematics Standards. This project will include lessons from the field-tested *Engineering is Elementary* units and *Teaching Science through Trade Books.* Of the partnership schools, LRSD is the largest with 23,363 students and 74.92% classified as low income. Of the 46 schools in the district, 39 are designated as *priority*, *focus*, or *needs improvement*. Therefore, LRSD is defined by ADE as a high-need school district. PA and LRCA are private schools located in Little Rock.

To address local and national needs, our partnership team reviewed several options and determined that teacher professional development focused on teaching science through trade books with additional lessons from *Engineering is Elementary* (EiE) would provide the best service to our teachers and, thereby, our students. Integration of science through trade books has many benefits including student engagement, providing context improved student focus, improved reading skills, and increased science achievement. Such instruction lends itself naturally to the inquiry based model. Trade books are a natural way to *engage* students and spark interest through a story while also providing context for the discussion of science concepts. Moreover, the gains are two-fold with improved student achievement in science and reading.

To meet the identified needs of teachers and ultimately impact Arkansas's K-4 students' interest in and understanding of science content, the partnership team will provide 100 hours of teacher professional development from September 2015-July 2016. The partnership team is comprised of three UALR faculty and three UALR STEM educators. The team will host PD meetings on two Saturdays during the fall term, two Saturdays during the

spring term, online for 16 hours across the two terms and for two weeks during the summer of 2016. To measure program impacts, non-participating teachers from the same schools (or similar schools) will be recruited for the comparison group to provide pre/post data. Through this project the team and partnering schools hope to meet the goals identified below:

Goals #1 – Improved teachers' knowledge and understanding of the AR K-4 Science Standards

Goal #2 – Improved teachers' content knowledge related to AR K-4 Science Standards on targeted content aligned with professional development lessons

Goal #3 – Improved teaching skills and increase teacher interest in and self-efficacy in teaching science

Goal #4 – Improved students' interest in and knowledge of science

The UALR will be the fiscal agent for this grant and provide meeting space/laboratories for the training and equipment to use during the training. Principals at each of the partnership school districts will encourage teachers to participate in the project and serve in the comparison groups; provide project data; encourage implementation of the grant activities; provide a means for dissemination of the training knowledge to the other teachers in their district; and collaborate with the partnership team to ensure the project meets the needs of each school.

Following Institutional Review Board (IRB) approval from UALR, this project will use a quasi-experimental, matched sample design. Both quantitative and qualitative data will be collected and diagnostic formative and summative assessments will be utilized. During the grant period only teachers in the treatment group will receive the professional development; thus scores from teachers (and their students) in the comparison group during this time will allow for an evaluation of the program's impact.

Initial data collection in September will include participant and comparison teachers' pretest measures of science standards, science content knowledge, and the *Science Teaching Efficacy Belief Instrument (STEBI);* participants' *Reformed Teaching Observational Protocol (RTOP*) measures; and students' pretest content knowledge *Science Process Assessments for Elementary Students (SPAES)* scores. During the school year, teacher in the treatment group will undergo professional development training through a combination of face-to-face and online activities, and project faculty will observe treatment group teachers in order to complete the RTOP observations. In May, teachers will collect students' content exam post-test (SPAES) scores; comparison group teachers will complete the measures of science standards, science content knowledge ad STEBI; and participants' RTOP measures will be completed. At the end of the Summer Institute, participating teachers will provide measures of science standards, science content knowledge, and the STEBI.

Overall, examination of the pre-and post- student scores, teachers' pre and post-measures of knowledge of the science standards, content knowledge, and efficacy will provide the project team with quality formative data to refine the treatment plan in subsequent years of the grant. Finally, summative measures will provide an overall evaluation of the program's success in meeting the stated objectives.

The partnership will provide 100 hours of K-4 science professional development from September 2015 through July 2016. The training will help to accomplish the partnership goals of improved teachers' knowledge and understanding of the AR K-12 Science Standards, teachers' science content knowledge, teaching skills and increased teacher interest in and self-efficacy in teaching science, and students' interest in and knowledge of science.