

Southern Arkansas University: The South Arkansas Integrated Science and Mathematics Initiative

The South Arkansas Integrated Science and Mathematics Initiative is designed to create and provide professional development activities to enhance both teacher content knowledge and instructional skills identified in the Next Generation Science Standards and the Common Core State Standards for Mathematics to teachers of science and mathematics in grades 3-8. The initiative addresses the data from a needs assessment conducted during a current MSP initiative in which eighty percent of the current participants expressed a desire for a professional development initiative integrating the Next Generation Science Standards with Common Core State Standards for Mathematics. In addition, data obtained during site visits to regional school districts also echo the strong need to provide premium professional development in cross curricular concepts, particularly in the integration of the Next Generation Science Standards with Common Core State Standards for Mathematics. This unique initiative is a collaborative partnership effort of Southern Arkansas University, the University of Central Arkansas, South Central Service Cooperative, and 14 public school districts from 3 different educational cooperative regions including: Stephens, Smackover, Parkers Chapel, Junction City, Harmony Grove, Emerson-Taylor-Bradley, El Dorado, Camden-Fairview, Texarkana, Lafayette County, Hope, Genoa Central, Fouke, and Ashdown School Districts.

Forty-four total teachers participated in the Integrated Science and Mathematics Institutes at South Central Service Cooperative in Camden and at remote sites in Texarkana by CIV (compressed interactive video) during July/August of 2014 with a professor at each site- greatly increasing the geographical scope of this project. The distance between the 2 sites is approximately 90 miles. Additional Summer Institutes are scheduled for 2015 and 2016. Each summer institute will include ten days of intensive instruction plus an additional six follow-up meeting days will be completed during the academic year in order to fully engage grade 3-8 science and mathematics teachers in the content and pedagogy of both Next Generation Science Standards and Common Core State Standards for Mathematics. An extremely experienced design, administrative, instructional, and evaluation team including Dr. Roger Guevara, Mr. Tim Daniels, Dr. Linda Griffith, Mrs. Christa Brummett, Ms. Marsha Daniels, Dr. Scott White, Dr. George Bratton, and Dr. Zaidy Mohdzain actively participated in the implementation of the project as well as the project's formative and summative evaluation in a quasi-experimental design.

The goals for this project include: 1) Increase teacher content knowledge in science and mathematics; 2) Increase the teaching skills of participants as measured by the Reformed Teacher Observation Protocol; 3) increase student academic performance as measured by the Arkansas mathematics and science benchmark exams for students of participating teachers; and 4) create a high performance consortium among the aforementioned partners.

Project activities provided over 100 contact hours during each year of the project. Essential activities include a two-week, 60-hour Summer Institute plus six 6-hour workshops conducted during 2013-2014 school year. Each training date used Compressed Interactive Video (CIV) to reach the East Team participants at South Central Service Cooperative area and a remote site in Texarkana covering the West Team region with the exception of the first day when all the participants convened in Camden to take the pre-test.

The intended results of this project include the following: 1) Increased teacher knowledge and understanding of science and mathematics; 2) Increased teacher knowledge, understanding and implementation of the Next Generation Science Standards and the Common Core State Mathematics

Standards; and 3) Increased integration of science and mathematics instruction through project based learning and appropriate technology.

Several measures were taken to measure the impact of this research study/professional development. For example, teachers took a content knowledge pre-test and post-test using a validated instrument (DTAMS) to measure the impact of the professional development. Trained Reformed Teacher Observation Protocol (RTO) professors conducted two classroom visits per teacher participant during the academic year to measure the transfer of the training into classroom practices. In addition, students of the participating teachers had their academic performance from state benchmark ACTAAP exams tracked to get additional data on the training's impact on student academic performance. The evaluation design also includes a control group that will also be established to further provide an additional measure of comparison on both teacher content knowledge and their respect student performance on state benchmarks.