



Select FCR-STEM Projects at a Glance

Online system aligns standards for educators, saving time and money

CPALMS Performance Support System (www.floridastandards.org)

To teach Florida's Next Generation Sunshine State Standards, educators need easy access to reliable information and high-quality resources. CPALMS, a web-based system developed in collaboration with Florida's teachers, meets those needs. Teachers, parents and administrators can find content standards for each grade level and course. Tools for lesson-planning and resource alignment are standards-driven and paired with a peer- and expert-review process. CPALMS also provides the state course code directory and a course-request tool that expedites review and approval of new courses within 90 days as required by state law. This innovative system serves more than 5,000 people a day worldwide.

A statewide roadmap for STEM education, policy-making and economic growth

STEMflorida (www.stemflorida.net)

Workforce Florida, Inc., chose FCR-STEM, in partnership with other groups, to lead the creation of a statewide plan to support quality STEM development in the state. Dubbed *STEMflorida*, the organization's goal is to make Florida a national leader in market-relevant STEM talent development and retention. As part of this effort, FCR-STEM has established an education advisory group that includes representatives from businesses, government, universities, K-12 educators and other organizations to produce a Florida STEM plan. Due out in December 2010, this plan will synthesize the statewide input from both the business and education communities.

Helping educators keep pace with changing standards

Professional Development for Principals and Teachers

FCR-STEM designs and provides professional development for teachers and school leaders across Florida as part of a math and science partnership of universities and school districts. This work currently involves:

Leadership for Mathematics and Science Instruction (www.lsi.fsu.edu/lmsi) is a one-year professional development program focusing on math and science content from the Next Generation Sunshine State Standards for school teams of principals and teacher leaders. To date some 350 educators from 48 school districts have participated, with hundreds more signed up. A randomized-controlled trial will study the program's impact.

Two-week summer institutes for K-12 teachers (www.flpromise.org) focus on deepening content-specific knowledge and skills related to Florida's mathematics and science standards. Conducted in partnership with the Florida State University, the University of Florida, the University of South Florida and Florida International University, workshops are led by a team consisting of classroom teachers and an arts and sciences faculty member.

Giving teachers tools to tailor individualized, relevant instruction

Mathematics Formative Assessment

FCR-STEM is developing a formative assessment system for early elementary math. Funded by the Florida Department of Education, it will provide teachers with tools and information to assess the progress of each student, allowing them to individualize instruction and provide additional support to improve learning. Teachers will have easy access to these assessments through the CPALMS online tools. A randomized-controlled trial will study the impact of the system.

High-performing students shed light on better learning for all

Examining Superior Performance in Advanced Placement Courses

With a focus on explaining superior performance in AP courses, this research examines the critical thinking skills of high- and low-performing students, contrasting the differences between these groups. The findings will increase our understanding of how best to improve student learning and performance, particularly in science and related fields.

Hands-on curriculum paired with professional development leads to better learning

Great Explorations in Math and Science (GEMS)

This study tested the effectiveness of the GEMS space science curriculum and related professional development in improving teachers' instruction and students' science learning in 130 elementary school classrooms. The curriculum is aligned with Florida's new science standards and the qualities of science teaching recommended by the National Research Council. The study demonstrated that students in the GEMS classrooms scored significantly higher on content knowledge and positive attitude toward science than those given traditional instruction. The findings will build state and district capacity to reform science teaching in ways that are aligned with Florida's new standards.

Equipping new science and math teachers with knowledge, skills and experience

FSU-Teach (www.fsu-teach.fsu.edu)

FSU-Teach is an undergraduate teacher preparation program, operated by the colleges of Arts & Sciences and Education, designed to increase the number and retention of high-quality science and mathematics teachers in grades 6 to 12. Students in this four-year program graduate with two majors, one in teaching, the other in science or math. FCR-STEM core funding from the Florida Legislature, combined with assistance from private grants, helped launch FSU-Teach. Its innovative approach emphasizes deep knowledge of both content and teaching and early experience in classroom teaching. Just two years in, the program has already attracted some 230 students.

Paving the way for females and minorities to succeed in STEM courses and fields

Female-Minority Initiative (www.lsi.fsu.edu/femaleminority)

FCR-STEM brought together a group of experts representing school districts, community colleges, universities, business, workforce development and STEM initiatives outside Florida to examine policies, programs and strategies that hold promise for increasing Florida's female and minority representation in STEM courses and fields. The group developed a comprehensive plan, released in February 2009, to increase the number and percentage of females and minority students enrolling in and successfully completing math and science courses. The report also made recommendations for increasing female and minority participation, achievement and persistence in STEM education and careers from kindergarten through college.

Teaming literacy with science to help students succeed

Individualizing Student Instruction in Science

This research project developed and tested second grade science units that integrated science and reading comprehension instruction. The units allowed teachers to tailor science instruction to each student's reading, science knowledge and vocabulary levels. After completing these specialized units, children made significant gains in literacy and science learning. Plus, children with weaker science and literacy skills made the same gains, on average, as did children with stronger skills.

Comparing innovative teaching approaches to business as usual

Integrated Math, Science and Technology (IMaST)

This study investigates the effectiveness of an interdisciplinary approach to teaching math, science and technology in the middle grades. The approach is based on a curriculum (IMaST) created by the Center for Mathematics, Science and Technology that emphasizes problem-solving, higher-order thinking and self-directed learning. Findings suggest that interdisciplinary instruction that incorporates inquiry-oriented, active student engagement holds promise for increasing student depth of knowledge, one of the primary goals of Florida's revised math and science standards.

Webcasts provide free, downloadable materials for Florida and beyond

Global Educational Outreach for Science, Engineering and Technology (www.geoset.info)

Developed by a team of FSU scientists led by Nobel laureate and FCR-STEM Director Harry Kroto, GEOSET uses a webcasting platform to provide free, downloadable teaching materials created by science and technology experts and educators. This award-winning site includes modules that help Florida educators teach essential math and science concepts for grades K-12, introduce students to science at the cutting edge and encourage them to consider STEM careers.

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