

FCR-STEM

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Florida Center for Research in Science,
Technology, Engineering, and Mathematics

An Overview of the Florida Center for Research in Science, Technology, Engineering and Mathematics

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FCR-STEM is a newly created multi-disciplinary research center funded by the Florida Legislature. On February 21, 2007, Governor Charlie Crist announced that Florida State University in Tallahassee was competitively awarded the contract through a request-for-proposal process administered by the Florida Department of Education.

FCR-STEM Mission

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Florida Center for Research in Science,
Technology, Engineering, and Mathematics

- **Research on student and teacher learning and the effectiveness of various curricula, teacher professional development approaches and technology-based interventions designed to increase student learning.**
- **Testing innovative in-service teacher programs designed to increase the recruitment, preparation, and retention of mathematics and science teachers in Florida.**
- **Technical assistance to the Florida Department of Education and local school districts through professional development and support for the implementation of evidence-based curricula and teaching practices.**
- **Dissemination of information on STEM education, evidence-based practices, and achievement trends in mathematics and science for Florida's K-12 students.**

The Center is jointly administered by the FSU College of Arts & Sciences, College of Education and Learning Systems Institute in the Office of the Provost.

FCR-STEM Director

Harold Kroto

Harold Kroto, Ph.D. is a co-recipient of the 1996 Nobel Prize in Chemistry, a Francis Eppes Professor in the FSU Department of Chemistry and Biochemistry, and an ardent advocate for K-12 science education worldwide. Dr. Kroto won the Nobel Prize for his co-discovery of buckminsterfullerene, a form of pure carbon with a molecular structure that resembles the geodesic domes designed by Buckminster Fuller.

Kroto joined FSU in 2004 and is a co-founder of the [Vega Science Trust](#) established to promote science education and science careers among young people. In 2001, he won the Royal Society's prestigious Michael Faraday Award, given annually to a scientist who has done the most to further public communication of science, engineering or technology in the United Kingdom. Through his [Global Educational Outreach \(GEO\)](#) initiative at Florida State University, he has started to create science programs, complete with video feeds, photos, graphics and PowerPoint presentations, and to make them freely accessible via the Internet to classrooms all over the world.

FCR-STEM Research Projects (1/2)

Study 1: Elementary Mathematics Curricula

This study will compare the relative effectiveness of three curricula and their impact on student learning. The focus will be the early grades, when it is critical to prevent disadvantaged children from falling further behind their more advantaged peers after entering elementary school. Curricula will be selected based on alignment with Florida's revised mathematics standards.

Principal Investigators: Laura Lang, Ph.D. and Larry Abele, Ph.D.

Time period: 2007-2009

Study 2: Individualized Science Instruction (ISI)

This study will develop and test the effectiveness of Assessment-to-Instruction (A2i) software – a tool that has been successfully used to support student reading growth. By taking a child's vocabulary and background knowledge into account, this tool is designed to help teachers individualize the amounts and types of science instruction for each child in the classroom and increase science learning.

Principal Investigator: Carol Connor, Ph.D.

Time period: 2007-2010

Study 3: Professional Development Approaches for Reform-Based Curricula

This study will investigate the effectiveness of *Great Explorations in Math and Science (GEMS)* professional development in improving middle-school students' learning in science.

Principal Investigators: Ellen Granger, Ph.D. and Sherry Southerland, Ph.D.

Time period: 2007-2009

FCR-STEM Research Projects (2/2)

Study 4: Evaluation of Texas Instruments Model District program.

This study will evaluate the implementation and effectiveness of the Texas Instruments Model Districts program, an intervention with eight goals: improved teacher knowledge, increased instructional time, use of common assessments, high student expectations, increased administrative support, increased motivation and learning, parental support of teaching and learning, and use of an accelerated curriculum.

Principal Investigators: J. Michael Spector, Ph.D. and Elizabeth Jakubowski, Ph.D.
Time period: 2007-2008

Study 5: Expert Performance Approach to Examining Superior Performance in Advanced Placement Courses.

A series of studies that focus on student performance and the cognitive processes leading to superior performance in advanced placement (AP) math- and science-related courses and assesses the extent to which teachers' domain-specific knowledge and ability to is related to their ability to improve the knowledge and performance level of their students.

Principal Investigators: Paul Ward, Ph.D., and David Eccles, Ph.D.
Time period: 2007-2012

Study 6: Technologically-based Math & Science Instruction.

The purpose of this study is to describe the extent to which technology-based instructional materials and teacher supports are being used in Florida's middle and high schools. The focus will be on what kinds of instructional technologies are being used in the classroom, by whom (teachers and/or students) and for what purposes (e.g., procedural versus conceptual learning).

Principal Investigators: Marcy Driscoll, Ph.D., Robert Reiser, Ph.D., and Elizabeth Jakubowski, Ph.D.
Time period: 2007-2008