INSPIRE

2010 Annual Performance Report
Administered by: Oklahoma State University
Type of Agreement: Cooperative Agreement
Project Manager: Steve Chance
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PROJECT DESCRIPTION

The Interdisciplinary National Science Project Incorporating Research and Education Experience (INSPIRE) is a multi-tiered student pipeline program designed for students in 9th to 12th grade, providing a vital link between NASA's Elementary/Secondary projects and Higher Education projects. The scope and purpose of INSPIRE will place a heavy emphasis on the recruiting of underserved and underrepresented students to ensure a diverse pool of candidates from throughout the U.S.

Students selected to participate will:

- learn about science, technology, engineering and mathematics (STEM) fields of study and careers;
- participate in the INSPIRE virtual Online Learning Community (OLC);
- and compete for unique, grade-appropriate summer experiences at a NASA facility.

NASA's unique mission provides the content for the virtual Online Learning Community, the centerpiece of INSPIRE. It provides a virtual place for INSPIRE students to interact with their peers, NASA experts and education specialists. Through grade-level-appropriate educational activities, chats and the discussion board, students and their families will be exposed to the many careers and opportunities at NASA. The OLC also provides parents and caregivers resources designed to help them champion their student's education and career goals.
To bridge the "digital divide" and ensure all students have an opportunity to participate in the OLC, those who qualify for the National School Lunch Program are eligible to be awarded a free laptop.

Once selected into the OLC, students are then eligible to compete for the following grade-appropriate summer experiences:

Explorer Experience: Rising 10th-grade students and their legal guardian compete to be awarded a summer visit to a NASA facility for a one-day VIP Tour, briefings and workshops.

Collegiate Experience: Rising 11th-grade students compete to participate in a two-week, on-campus residential experience during the summer at a college or university selected by NASA. This exposure to college students and faculty is designed to encourage improved study skills and the pursuit of higher education and careers in STEM areas. The college or university provides lodging, meals, supervision, and educational activities.

Residential Internship: Rising 12th-grade students who will be at least 16 years of age at the start of the internship compete to participate in a paid 8-week summer internship at a NASA facility. Students gain valuable on-the-job experience by working directly with NASA scientists and engineers during the work day and will participate in enriching after-work educational and cultural activities. During the internship, students receive:

- A stipend based on minimum wage for the state in which the NASA facility is located and lunch allowance to cover the workweek;
- Meals and housing at a location within commuting distance from the NASA facility;
- Transportation to and from work and any after-work project activities;
- On-site supervision and structured enrichment activities after work hours;
- Mentoring by scientists and engineers at the NASA Centers during work hours.

Pre College Internship: Rising college freshmen who will be at least 16 years of age at the start of the internship compete for participation in a paid 8-week summer internship at a NASA facility. Applicants for this experience must have been accepted at a college or university and declared a STEM major. This experience provides valuable on-the-job training and introduces the students to other education and employment opportunities. Lodging, meals, transportation and after-work activities are the responsibility of the student. NASA will pay the student a stipend of $5,000 in three installments, providing all requirements have been met.

PROJECT GOALS

Goal 1:
Serve as a nationwide project to develop emerging adolescent and parental awareness and *understanding of STEM-related education and careers.*

Goal 2:
Engage students and families with grade-appropriate resources and activities/educational modules and provide the capability for them to interact, ask questions, and share knowledge with their peers through participation in the OLC.

Goal 3:
Provide unique NASA/STEM experiences to students and their families to further inspire and reinforce student's aspirations to pursue STEM education and families to support their student's pursuits.

PROJECT BENEFIT TO OUTCOME 2

INSPIRE benefits Outcome 2 by attracting and retaining students in STEM disciplines by providing students and families NASA resources and grade appropriate experiences through participation in the OLC and unique summer experiences. These activities and experiences nurture and support student interest while helping them understand the skills necessary for a STEM career.

INSPIRE is a critical link in NASA's pipeline of projects, drawing students from the middle grades, other Elementary and Secondary Projects such as NASA Explorer Schools (NES), NASA Foundations of Influence, Relationships, Success and Teamwork (FIRST) Robotics, Science Engineering Mathematics and Aerospace Academy (SEMAA) and center-unique projects like the High School Aerospace Scholars Program (HAS) at the Johnson Space Center (JSC), and engaging them early in high school with NASA in STEM-related fields. As students exit INSPIRE, they are encouraged to expand their education and employment activity in next-level NASA projects such as Motivating Undergraduates in Science & Technology (MUST), Undergraduate Students Research Program (USRP) and Human Capital-sponsored programs such as the Student Temporary Employment Programs (STEP), the Student Career Experience Program (SCEP) and other internship programs.

PROJECT ACCOMPLISHMENTS *(CONNECTION BACK TO ANNUAL PERFORMANCE GOALS AND PLANS)*

During the application process, students were asked to volunteer the identity of their race, ethnicity, and gender. 73% of the applicants volunteered the information and identified themselves as:

- 50% Caucasian
- 20% Asian
- 11% African American
- 9% Hispanic
- 10% "Other"
- 61% Male
- 39% Female

Demographics:

- 322 9th grade students
- 484 10th grade students
- 541 11th grade students
- 438 12th grade students

To bridge the digital divide and to ensure students from distressed socioeconomic families have unimpeded access to the Online Learning Community, 130 students who qualify for the National Free or Reduced Lunch Program were awarded a laptop computer.
INSPIRE's budget was cut dramatically in FY10. As a result, the number of students who were able to participate in INSPIRE Summer STEM Experiences (SSE) was significantly reduced in FY10.

The following is a comparison of the number of students participating in the 2010 Summer Experiences compared to 2009:

Summer Experience	2009	2010
Explorer*	84	9
Collegiate	105	60
Residential Internship	105	52
Pre College Internship	92	59

* In addition, unlike previous years where the centers host this Experience, it was hosted at the Kennedy Space Center only in conjunction with the launch of STS-134 and the Minority Student Education Forum.

Examples of accomplishments during FY10 include:

- Several of KSC's INSPIRE interns served on student discussion panels during the Minority Student Education Forum.
- INSPIRE continues to publicize and recruit participants from other Education projects such as NES, SEMAA, and FIRST.
- Continued promotion through the NASA Education's webpage "Current Opportunity" feature and sending an "Express Message" to almost 18,000 subscribers.
- Residential and Pre College Interns shared their experiences with students at other Centers and the public through the use of the DLN capabilities.
- Students participated in near peer mentoring opportunities with higher education and Office of Human Capital student projects. (e.g. USRP, MUST, and Co-op)
- Approximately 134 students participated in other NASA education projects prior to their selection into INSPIRE such as NES, SEMAA, HAS, "MathCounts" and the Langley's Research's Center's Collaborative Internship Project (LERCIP).

PROJECT CONTRIBUTIONS TO PART MEASURES (*INCLUDE DATA PLUS EXPLANATION)*

PART 9: Percentage increase in the number of elementary and secondary students participation in NASA instructional and enrichment activities.

1,784 students were selected to participate in the OLC during FY10, an increase of 466 students (35%) from FY09. The number of states represented increased from 47 in 2009 to 48 and included students from the District of Columbia, and Puerto Rico. States and territories not represented were North Dakota, Wyoming, and the U.S. Virgin Islands.

PART 10: Percentage of students expressing interest in science and technology following their involvement in NASA elementary and secondary education programs.

INSPIRE collected student interest in STEM on OLC Student Surveys administered in September (pre) and May (post). INSPIRE uses a pre and post model to collect this data, asking students to rate their interest level in STEM careers at the start of their INSPIRE OLC experience and after their INSPIRE OLC experience. Students were required to complete the OLC pre survey in order to gain initial access to the OLC whereas no such requirements were put forth for completing the post survey, which is likely the reason why so few students completed the post OLC survey for this project year. On the post survey, 100% (130/130) students responded being "interested" or "very interested" in a STEM career. INSPIRE also collected pre and post data on student's Summer STEM Experience. A total of 177 students completed the SSE pre survey with 175 responding as "interested" or "very interested" (99%). A total of 175 students completed the SSE post survey with 175 responding as "interested" or "very interested" (100%). It was no surprise student's interest was so high pre and post as they self-selected to apply for a SSE based on their high interest in NASA and STEM.

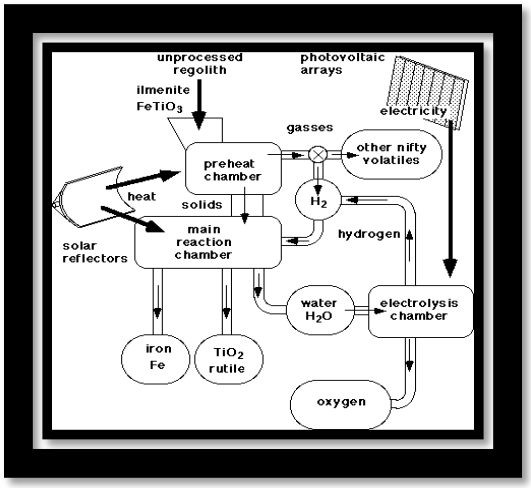
IMPROVEMENTS (e.g. project management, efficiencies, etc.) MADE IN THE PAST YEAR

The Online Learning Community (OLC) was restructured and modernized:

- Best practices from the 2009 OLC were incorporated to help add a fresh new look to the 2010 OLC resulting in improved interactivity for all participants, based on recommendations from staff and students, as well as from evaluation results.
- A tag line was developed: "Discover, Connect, Equip" to promote a clear vision for the participants, as well as providing the layout theme for the design of the entire web space.
- Additional NASA educational opportunities were added and promoted to encourage INSPIRE students' participation and broaden their exposure to the large variety of unique learning tools that only NASA can provide.
- Providing weekly online chats, discussion boards and blogs.
- A "Team Patch/Project Logo" design competition was implemented where INSPIRE participants had an opportunity to create a "mission patch" in the tradition of the patches designed for each shuttle mission. The winning design was made into cloth patches and decals and distributed to all members of the OLC. The winning patch was also utilized throughout the OLC and other venues (e.g. newsletters) representing the INSPIRE project.

2009-2010 INSPIRE logo designed by a 12th grade student

- A "Lunar Habitat" challenge was implemented on the OLC where students worked in virtual teams to locate sites and design living and working quarters for astronauts on the moon. Thirty teams of six students each spent eight weeks collaborating via the internet. The groups were tasked to research and develop a potential lunar site meeting specific criteria and constraints and then designing a habitat, to be constructed on this site, which would allow humans to live and work on the moon for 30 days. Teams submitted their findings, on line, in a presentation format which was shared with other community members. The top 3 designs were reviewed by a NASA scientist who is involved in Lunar Systems Designs with feedback being provided to the submitting teams.



Team #10 submitted an outline showing how oxygen would be produced in their Lunar Habitat by heating mined lunar regolith to remove hydrogen and helium.

- The Residential and Pre College students wrote "blogs" in the OLC sharing highlights of their summer internship experiences as a way to connect with and engage students at other Centers and to the larger online community.
- Students were offered numerous activities through the OLC in which they could choose to participate either on a team or individual level during the summer months.

PROJECT PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

As the primary project partner, Oklahoma State University (OSU) provides administrative support for project implementation such as: logistical support, chaperones and student advisors who provide supervision during off work hours for students participating in the Residential Internship, coordination and payment of transportation expenses and stipends, national recruitment efforts, and the OLC capability. To broaden the underrepresented and underserved student participation, OSU has partnered with the National Science Foundation's Louis Stokes Alliances for Minority Participation (LSAMP), the American Indian Science and Engineering Society (AISES), and is working with Hispanic Serving Institutions. Evaluation of the project is done through the Technology for Learning Consortium, Inc.

As a result of a 2008 solicitation through the Space Grant Consortium, the following academic institutions were selected to provide INSPIRE's 2-week residential, on-campus Collegiate Experience:

- The University of Puerto Rico (Hosted at the Interamerican University campus in 2010)
- Virginia Polytechnic Institute and State University (Virginia Tech)
- South Dakota School of Mines and Technology