

NASA Aerospace Education Project

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PROJECT DESCRIPTION

The Aerospace Education Services Project is a comprehensive project designed to reach out to the formal and informal education communities in all fifty states and the U.S. territories. The AESP staff consists of education specialists who are professional educators assigned to NASA centers. The AESP education specialists share NASA's use of emerging instructional technologies and the motivating outcomes of NASA's research, exploration and discovery with education communities and the public. The AESP primary focus is a professional development effort that serves the elementary and secondary education community by providing classroom demonstrations, distance learning events, in-service training for educators, pre-service training for university students, and identification of appropriate NASA education resources. The project also motivates students to continue their study of science and mathematics throughout their school career and encourages them to pursue the NASA workforce pipeline.

PROJECT GOALS

All AESP activities are designed to support the NASA Education Strategic Framework. AESP works to attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty. AESP focuses its efforts to meet the following goals:

1. Work closely with higher education to strengthen pre-service and in-service teacher education at colleges and universities where NASA R&D is conducted.
2. Shift the focus of Education Specialist school visits from one-time visits and school assemblies to efforts that strengthen university-based professional development.
3. Participate strategically in conferences such as state and regional science teachers' meetings.
4. Work early with new NASA projects that are planning K-12 components, to contribute ground-truth perspective on the actual needs of teachers, state curriculum standards, and mechanisms for training and dissemination.
5. Give priority to the needs of schools.
6. Facilitate collaborations between K-12 schools and university and industry-based scientists and engineers.
7. Utilize technologies to reduce distance, deliver customized solutions, and support collaboration.
8. Support differentiated specialist training and activity.
9. Develop imaginative strategies to help prepare NASA's future workforce.

PROJECT BENEFIT TO OUTCOME 2

Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers and faculty.

The goals of the AESP Project align to Outcome 2 of the 2006 NASA Education Strategic Coordination Framework (<http://education.nasa.gov/about/strategy/>) which works to “attract and retain students in STEM disciplines.”

AESP provides educators and students with tools, experiences and opportunities to further their education through educator workshops, classroom demonstrations, parent programs and classroom resources. Informal education programs and activities are conducted at science centers, museums, and related facilities.

In FY08, 11,282 educators participated in AESP STEM professional development opportunities. A follow-up survey of a sample of teacher participants indicates that, among those who attended professional development, 72% subsequently used NASA resources in their classrooms.

AESP offers student programs to engage and retain students in STEM education and encourages them to pursue educational disciplines that are critical to NASA’s future engineering, scientific, and technical missions. Through AESP, 61,418 students participated in NASA instructional and enrichment activities in FY08.

PROJECT ACCOMPLISHMENTS

1. (Higher Education) AESP’s initial national competition for college/university proposals for funded collaborations in teacher education has yielded 21 proposals (Oct. 2008), which will be competitively reviewed for approximately 10 awards for 2009.
2. (Focus of school visits) While still reaching over 61,000 K-12 students, the program placed greater emphasis on programs for teachers than in previous years. For example, the ratio of (teachers participating in professional development) : (students served by student programs) more than doubled from FY07 to FY08.
3. (Strategic conference participation) Conference participation is now guided by a specialist-led Professional Development Working Group, and approximately 50% of all proposals now cohere to an annual AESP-wide theme, the same theme required in the collaborative college courses referenced in #1 above.
4. (Work early with NASA projects) A specialist-led Product Development Working Group is actively engaged in developing means for AESP to participate meaningfully and early in the development of new NASA education and public outreach products.
5. (Priority to the needs of schools) Our new approach to evaluation and specialist professional development stresses longitudinal assessment of school-based outcomes and systematic inquiry into the practices that best support such outcomes, a shift from an approach that was limited to end-of-workshop reports that provided little insight into actual classroom practice.
6. (Collaborations) A specialist-led Alliances Working Group is developing systematic mechanisms for communicating with partner organizations, tracking

those communications, and supporting long-term programmatic memory and cross-project information sharing. To date, contacts and notes have been logged by specialists with more than 200 different organizations in our SharePoint system.

7. (Technology) AESP has built a comprehensive, secure IT infrastructure for workflow management, intra-project communication, and cross-center collaboration, using Windows SharePoint Services. The system includes features such as version control, integration with PC calendar/contact/email software, and smart phone synchronization.
8. (Differentiated training) Each specialist now has individual professional development goals for the coming year, with support for travel, study, etc. to support the development of differentiated expertise in both a technical area and an educational area.

PROJECT CONTRIBUTIONS TO PART MEASURES

PART measure 7: Percentage of elementary and secondary educators "who haven't participated in intensive NASA training programs and use" NASA content-based STEM resources in the classroom

4,964 teachers participated in AESP short-duration (< two days) professional development opportunities in 2008. Over 70% of the teachers who attended short-duration professional development subsequently used NASA STEM resources in their classroom instruction.

PART measure 8: Percentage of elementary and secondary educators who participate in NASA training programs who use NASA resources in their classroom instruction.

6,318 teachers participated in AESP long-duration (> two days) professional development opportunities in 2008, Almost all of the long duration professional development training was in support of the NASA Explorer School Project.

PART measure 9: Percentage increase in number of elementary and secondary student participants in NASA instructional and enrichment activities.

AESP student participation in NASA instructional and enrichment activities decreased in 2008, consistent with AESP's plan to shift its focus from students to teacher professional development. With fewer specialists and the change in emphasis, the project reached 61,418 students, which is 37% of the 2007 figure. However, this figure is still significantly higher than AESP's FY08 goal of 23,600 students.

IMPROVEMENTS MADE IN THE PAST YEAR

Management/Evaluation

The project has centralized service requests into a single project-wide workflow management system, reduced the number of project assistants and the ratio of assistants to educators, dramatically reduced the university-side staff, and developed new tools for outcomes evaluation.

AESP has also developed a new traveling program, *Robots on the Road*, which will in subsequent years, significantly increase the numbers of students reached directly through AESP programs, while simultaneously maintaining the new emphasis for center-based specialists on teacher professional development.

PROJECT PARTNERS

Penn State has a subcontract with the National Space Grant Foundation to administer a competitive grants program to fund higher education members of Space Grant Consortia to support professional development courses aligned to state standards and needs. The project plans to support a competition each year.

AESP works closely with the NES project and other NASA Education Office and mission-originated EPO efforts.

AESP is actively engaged in shaping and supporting new NASA and NASA-related grant proposals, with the goal of leveraging other resources and, in turn enabling other projects to take advantage of AESP's ability to deliver services nationwide.