

# **NASA LEARN**

**Learning Environments and Research Network**

**Annual Report**

- 1. ePDN (Electronic Professional Development Network**
- 2. NASA-sponsored Classroom of the Future**
- 3. NASA Digital Learning Network™**

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# 1. NASA Electronic Professional Development Network Annual Report

## October 1, 2007-Sept. 30, 2008

### Project Description

ePDN is in the proposal review process with anticipated award in November, 2008. Source selection information is restricted at this time pending recommendation, approvals, and award of Cooperative Agreement.

#### *(Excerpt from ePDN CAN)*

A. The recipient will work with NASA to implement an electronic professional development system for educators focusing its efforts to meet objectives under the NASA goal: Using NASA's unique mission content to equip educators with the skills and knowledge to inspire, engage, and educate students in science, technology, engineering and math (STEM). The following is the NePD description and includes the responsibilities of the recipient:

1. Research existing and emerging education and communication technologies and apply these technologies to meet project objectives. Such research shall include but not be limited to the following technologies:
  - o Videoconferencing
  - o Web Casting
  - o Instructional Television
  - o Online collaborative tools
  - o Learning Management Systems
  - o Online Immersive Environments
  - o Educational Games
  
2. Determine the electronic professional development needs of educators and the NASA Education Projects listed below, through regular consultation/conferences with NASA project managers and their internal and external educators. Work closely with other NASA educator professional development initiatives to provide expertise, and developmental assistance in the area of ePD. Collaborate with and use NASA eEducation infrastructures to deliver ePD experiences to educators associated with NASA Education Projects listed below.
  - o Aerospace Education Services Project (AESP) *Also note mini-grant opportunities on this site:*  
<http://www.nasa.gov/audience/foreducators/AESP.html>
  - o Interdisciplinary National Science Program Incorporating Research Education Experiences (INSPIRE)  
[http://www.nasa.gov/audience/forstudents/postsecondary/programs/INSPIRE\\_Project.html](http://www.nasa.gov/audience/forstudents/postsecondary/programs/INSPIRE_Project.html)
  - o NASA Explorer Schools (NES) <http://explorerschools.nasa.gov/portal/site/nes>
  - o Science, Engineering, Mathematics, and Aerospace Academy (SEMAA)  
[http://www.nasa.gov/centers/glenn/education/SEMAA\\_GRC.html](http://www.nasa.gov/centers/glenn/education/SEMAA_GRC.html)
  - o Teaching from Space Project (TSP)  
[http://www.nasa.gov/audience/forstudents/postsecondary/programs/Teaching\\_From\\_Space.html](http://www.nasa.gov/audience/forstudents/postsecondary/programs/Teaching_From_Space.html)  
[http://www.nasa.gov/mission\\_pages/station/science/experiments/TFS.html](http://www.nasa.gov/mission_pages/station/science/experiments/TFS.html)
  - o NASA Educational Technology Services (NETS)
  - o Educator Resource Center Network (ERCN)  
[http://education.nasa.gov/about/contacts/Educator\\_Resource\\_Center\\_Network.html](http://education.nasa.gov/about/contacts/Educator_Resource_Center_Network.html)
  - o NASA-sponsored Central Operation of Resources for Educators (CORE) <http://core.nasa.gov>
  - o NeTV – NASA Educational Television, <http://www.nasa.gov/multimedia/nasatv/>
  - o LEARN – Learning Environments and Research Network (Digital Learning Network,  
<http://dln.nasa.gov> and NASA-sponsored Classroom of the Future, <http://www.cet.edu/?cat=coff>)
  - o The Endeavor Science Teachers Certificate Program (ESTCP) currently being competed by NASA  
<http://www07.grants.gov>;  
<http://www07.grants.gov/search/search.do?oppld=41301&flag2006=false&mode=VIEW>.
  
3. Design, prepare, deliver, and evaluate electronic professional development experiences including the effective choice and use of appropriate delivery technologies. Select applicable subject matter experts, presenters, and guests who contribute to the experiences, course materials and presentations that meet the professional development objectives of educators and NASA Education Projects. Offerings will include, as a minimum:
  - o Events (1-2 hour asynchronous or synchronous presentations)
  - o Workshops (2-4 hours or multiday asynchronous or synchronous ePD sessions)
  - o Courses (extended asynchronous or synchronous ePD course work leading to higher or continuing education credits). Length and number to be determined based on consultation with NASA project managers.

4. Develop a new or adapt an existing centralized Web-based learning management system to meet the needs of NASA education projects and their internal and external educators. The system shall have, as a minimum, the following capabilities:
  - Categorized catalog of NePD experiences to include such experiences as modules, events, workshops, and courses
  - Registration and Scheduling of selected sessions
  - Tracking and reporting of completed work, progress toward learning objectives, and user feedback
  - Communication capabilities including email distribution, chats, blogs, shared work spaces to include communication with NASA staff and other learners via online technologies
  - Capability for users to construct events, workshops, courses
5. Communicate with and inform potential NePD educators of experiences. Organize and nurture a NASA Education online learning community, using as a minimum:
  - Listserves, eBlasts,
  - Brochures/Flyers
  - Multimedia
  - Conference Presentations
6. Establish and maintain collaborations with other ePD professional organizations through conference attendance and online communication methods, in order to incorporate the latest on-line technologies and best practices in the development and delivery of ePD experiences. Apply the most effective technologies and instructional design principles.
7. Develop the policies and procedures that direct the planning, implementation, and evaluation of NePD activities and collaborate with NASA Project Managers and the NASA Technical Monitor for review and comments.
8. Coordinate the work of NePD with the NASA Technical Monitor and NASA Project Managers, NASA HQ Office of Education and Center Education Offices, NASA Mission Directorates, and other NASA offices as appropriate.
9. Promote NePD at professional conferences, with the formal and informal education communities, and other appropriate partners in order to establish a broad level of engagement in NePD activities

<p><b>Project Goals</b>  <b>Project Benefit to Outcome 1, 2, or 3:</b></p>
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*(Excerpt from ePDN CAN)*

Powerful technologies are on the horizon that will enable new learning environments using simulations, visualizations, immersion, online game playing, intelligent tutors, learner networking, e-Professional Development (ePD), video learning clips and more. These capabilities are creating rich and compelling learning opportunities that meet the needs of individual learners. It is incumbent on NASA to work to develop new methods of making its exciting discoveries and valuable resources available to students, educators and researchers.

In the future, learning will be on demand. Students, educators, researchers, and the public will be able to receive what they need, when they need it, and where or how they want it. NASA is working toward this education future, developing new methods for making its exciting discoveries and valuable resources.

The intent of NASA e-Education is to develop an infrastructure and deploy research-based technology applications, products, and services that enhance the educational process for formal and informal education. It serves a cross-cutting function across the three education divisions (Higher Education, Elementary/Secondary Education, Informal Education) and effectively addresses all four levels (employ, educate, engage, and inspire) of involvement as depicted in the Education Strategic Framework.

The National Research Council (NRC) was commissioned by congress in 2007 to conduct a year-long review of NASA's Elementary/Secondary Education Program. While focusing primarily on NASA initiatives, the review has general applicability to all organizations engaged in STEM education. Specific mention is made of Teacher Enhancement and Professional Development ([http://books.nap.edu/openbook.php?record\\_id=12081&page=62](http://books.nap.edu/openbook.php?record_id=12081&page=62)). Working with other NASA Education Projects that are covered in the NRC review, the NePD initiative will address professional development activities associated with those Projects.

<p><b>Project Accomplishments:</b></p>
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Working with HQ Office of Education, LaRC Procurement Office, LaRC Chief Council, and LaRC Office of Strategic Communication and Education management, a solicitation was developed in

2008 and subsequently posted through grants.gov and nspires.nasa.gov. Additional input was also collected from E/S Project Managers. Proposals were received by the LaRC Procurement Office. A review team was assembled and will be meeting at LaRC during the week of Nov. 2 for the purpose of making an award recommendation.

**Project Contributions to Part Measures:**

Outcome 2, Objective 2.1 (Short Duration PD) and 2.2 (Long Duration PD) Other objectives and measures TBD when the activity begins after award.

**Improvements Made in the Past Year:**

NA

**Project Partners and Role of Partners in Project Execution (for follow up):**

NA

## 2. NASA COTF Annual Report October 1, 2007-Sept. 30, 2008

### Project Description

Classroom of the Future comprises five separate projects: Product Review, Videogame Learning, NASA TV, Virtual Worlds and Educational Technology Benchmarking.

**NASA Educational Product Review:** Conduct pre-publication quality reviews of NASA education materials, using teachers and subject matter experts as reviewers.

**Videogame Learning and Assessment.** To study learning and assessment within instructional videogames COTF developed and refined an online, single player game, embedded assessment tools, external (traditional) assessments, and analyzed adolescents' gameplay data within a prototype informatics system.

**NASA TV:** Prepare NASA Educational TV monthly program schedules in association with NASA education and TV offices, and web stream routine and special events.

**Virtual Worlds:** Research *Second Life* to understand education opportunities within virtual environments. Explore both current best practices and construct educational experiences as research tools.

**Educational Technology Benchmarking:** Determine exemplary educational technologies and explore means of engaging NASA product developers and educators in meaningful discussions about design principles and best practices.

### Project Goals

**NASA Educational Product Review:** Ensure that NASA education activities meet quality standards through external review by teachers and subject matter experts.

**Videogame Learning and Assessment:** Develop a theoretical framework for the development and evaluation of educational games.

**NASA TV:** Provide operational support and content expertise to NASA Education TV.

**Virtual Worlds:** Explore effectiveness of *Second Life* virtual world for education.

**Educational Technology Benchmarking:** Research, disseminate and create social network to share information about effectiveness of educational technologies.

### Project Benefit to Outcome 1, 2, or 3:

**NASA Educational Product Review:** Directly supports NASA educational product/ curriculum development (Outcome 2.3) by providing quality evaluation of products.

**Videogame Learning and Assessment:** Outcome 1. Undergraduate students ( $N=2$ ) and faculty ( $N=2$ ) integrated *Selene* into a year-long sequence of senior-level software engineering classes. The students developed the software engineering requirements document and designed, developed, and tested external assessments measuring knowledge gained through the *Selene* game. Student growth due to this hands-on learning presented at SIGCSE, a national conference focused on pedagogy to improve computer science education.

Outcome 2, Objective 2.4: (Engage) Provided K-12 students with authentic first-hand opportunities to participate in NASA mission activities, thus inspiring interest in STEM disciplines and careers.

- 59 adults served as *Selene* recruiters. Of these, 31 were formal educators recruiters and 24 used *Selene* within formal education venues.
- Middle and high school-aged students ( $N=406$ ) learned about the formation and evolution of the Moon by playing *Selene*. This learning goal is linked to the *Return to the Moon* and current NASA missions (e.g., LRO and LCROSS). *Selene* also supports national and state science education standards.
- Middle and high school-aged students ( $N=4$ ) studied how *Selene* players learn, and assisted with prototype development and data collection for COTF's external assessment to validate assessments embedded within the *Selene* game. This student team won regional honors in a nation-wide competition, receiving \$8,000 in prizes toward their college educations (see <http://selene.cet.edu/?page=news&id=30>).

Outcome 3. *Selene* adult recruiter volunteers used *Selene* in informal education venues. One recruiter used *Selene* as a family activity.

**NASA TV:** Supports Outcome 2.3 (Curricular Support Services) by providing NASA experiences to millions of TV viewers and web stream recipients.

**Virtual Worlds:** This research ultimately supports NASA program goals 2.1, 2.2 and 2.4 by our exploration of best practices for educational uses of *Second Life*.

**Educational Technology Benchmarking:** Educational Technology Collaborative (ETC) helps inform educators about technologies and their application to teaching and learning and supports Outcome 2.1 (short-duration professional development). So far, ETC has been promoted to three specific audiences to enhance their professional development:

Teachers from the NASA Explorer Schools, NASA curriculum developers, and Challenger Learning Centers staff.

#### **Project Accomplishments:**

**NASA Educational Product Review:** Between Oct 1, 2007 and Sept 30, 2008, 38 products were submitted for review; 19 were ultimately approved, two were rejected and 17 are still in the pipeline. The average length of time between COTF's receipt of a product and sending the review comments to the developer was 8 weeks. The three centers submitting the most products were: Marshall Space Flight Center (26), Johnson Space Center (16), and Langley Research Center (8).

**Videogame Learning and Assessment:** Created requirements and design documents, plus table of improvements to guide next generation of *Selene* to be accomplished through new NSF funding. Improved assessment tools and game informatics system, and developed external assessment to evaluate learning and perceived experience. Produced two conference papers, a workshop, a keynote address in Mexico, two book chapters, and a journal article. *Selene* recently won awards from the Association for Educational Communications and Technology, and Science Magazine and NSF. NASA discontinued funding *Selene* in Sept 2008.

#### **NASA TV:**

- Completed (12) months of NASA Educational TV scheduling.
- Expanded NASA ED TV outreach into (2) schools and cable systems: District of Columbia Public Schools "Instructional TV" (DSTV), with the Denver Public Schools, DPS Channels 22 and 48.
- Completed (24) NASA Streaming Audio and Video Interest Group teleconference from MSFC. (MSFC, Ames, GSFC, JPL and COTF)
- Facilitated planning, testing, and possible roll out of new streaming technology for P2P (peer to peer) streaming.
- Delivered NASA TV to 23,294,822 concurrent streams, 6,822,002 page views and 4,658,962 COTF streams. This included seven major web streaming events for NASA's STS122, STS123, NASA's ATV (automated transfer vehicle), STS-124, Phoenix Lander

Mission to Mars, Delta2 launch of GLAST (Gamma-ray Large Area Telescope) and STS125.

- Completed 19 video conferences:
  - \* Jan 29 from New Orleans NASA IV&V, MSFC, on Space Weather Action Centers Teacher Workshop.
  - \* NASA eEducation Product Showcase Series- Episode 5, Educator Workshop and NASA COTF
  - \* May 28 completed web streaming for eEducation Product Showcase Series – Episode 6, Smart Skies.
  - \* May31 and June 2 completed (2) special eEducation web streaming events for NASA's Second Life / Virtual Learning Environment Testing with content about STS-124 launch and mission
  - \* June 10<sup>th</sup> completed a webinar for COTF EdTech Collaborative
  - \* June 30 completed distance learning event for NASA Ed at NECC 2008 in conjunction with DLN.
  - \* July 11 completed distance learning event for NASA Ed at NECC 2008 in conjunction with DLN.
  - \* July 15 completed 5 IP Video conferences on: Product review with Bob Starr
  - \* July 21,22,23 completed StormE with Mississippi State July 21,22 and July 23 with Laurie Ruberg & Bruce Howard on Ed Tech Collaborative for the Building Partnerships for Sustainability Workshop.
  - \* July 20 – 25 completed IP VidCon with DLN on Robotics, Wall-E DLN Module, POC is Marci Delaney
  - \* Sept 11 completed DLN Video Conference with USRP (Undergraduate Student Research Program) out of LARC and Dr. Alan Pope.
  - \* Sept. 30 completed IP VidCon with DLN on Selene Final Report, with LARC, MSFC, Goddard and JSC.

**Virtual Worlds:** Conducting introductory, exploration phase of research including familiarization with working within Second Life (SL), and improving COTF technical capabilities (video card upgrades, purchase of voice/audio headsets, etc) to participate and create scripts in SL. Consulted with SL expert to learn nominal and leading edge educational uses of SL. Initiated scripting and planning of COTF SL island and activities. Two team members approved for work in Teen Grid of SL.

**Educational Technology Benchmarking:** Revise seven research manuscripts on educational technology benchmarking and publish in a special issue of the *International Journal of Information and Communication Technology Education*, (Vol. 4, No. 4; 2008). A prototype ETC website ([www.edtechcollaborative.com](http://www.edtechcollaborative.com)) was developed and is now in pilot as a forum for sharing information about uses of educational technologies. ETC has been promoted to NASA Explorer Schools, the Pre-Service Teacher Institute, the West Virginia Health-Sciences Technology Academy, and Engineering Education Teachers. Currently has hosted over 4000 unique page views, and has about 150 registered users. Created a spin-off site called the CLC-Collaborative ([www.clccollaborative.com](http://www.clccollaborative.com)) for informal educators, and presented at the annual Challenger Learning Center conference. Much of the impetus for this was to respond to the new Space Act Agreement signed by the CLC network and NASA.

#### **Project Contributions to Part Measures:**

**NASA Educational Product Review:** The NASA Educational Product Review process is an infrastructure activity that directly supports NASA educational product/curriculum development.

**Videogame Learning and Assessment:** 2.4.4 Percentage increase in number of elementary and secondary student participants in NASA instructional and enrichment activities. During FY08, 406 students played *Selene* as part of the research program.

**NASA TV:** PART Measure 10. Number of people reached via eEducation technologies per dollar invested. Explanation: NASA will continue to use internet- and web-based technology to deliver content to reach ever larger numbers of participants. Percentage reductions are per year over the preceding year. This is the baseline year.

**Virtual Worlds:** NA at this time due to focus on preliminary research, product planning, and assessment of best practices.

**Educational Technology Benchmarking:** Determining baselines in 2008.

PART Measure 2. Percentage increase in number of elementary and secondary educators utilizing NASA content-based STEM materials and programs in the classroom. Explanation: Educators obtain NASA STEM resources in a number of ways such as through direct participation in training experiences where materials are demonstrated. Feedback from these educators will be the basis for setting the percentage baseline.

PART Measure 10. Number of people reached via eEducation technologies per dollar invested. Explanation: NASA will continue to use internet- and web-based technology to deliver content to reach ever larger numbers of participants. Percentage reductions will be per year over the preceding year.

#### **Improvements Made in the Past Year:**

##### **NASA Educational Product Review:**

- Created a Product Review Feedback form ([www3.cet.edu/review](http://www3.cet.edu/review)) and updated the Product Review Form
- Provided development assistance allowing the timely completion of three new activities for presentation at the NASA's 50<sup>th</sup> Birthday Boston Forum presentation.
- Presented an interactive videoconference to NASA centers and developers.
- Began reviewing DLN activities after discussion with managers regarding the review process (early stages).
- Added two AP calculus classroom teachers to our facilitator team.
- Began providing product submitters a list of the most common writing mistakes and the National Institute of Standards and Technology "Metric Style Guide".

**Videogame Learning and Assessment:** Enhanced videogame project management by use of (a) a team blog to archive and collectively document programmatic decisions and data details and (b) a controlled access Sharepoint project management tool.

**NASA TV:** Based on COTF NASA Ed TV Survey achieved stability in programming. Added additional encoder backup (Quicktime and Windows). All 19 video conferences were new for DLN.

**Virtual Worlds:** Initiated project as described above.

**Educational Technology Benchmarking:** Developed and continuously refined Educational Technology Collaborative websites in response to pilot users feedback.

#### **Project Partners and Role of Partners in Project Execution (for follow up):**

Nothing.

### **3. NASA Digital Learning Network™ Annual Report October 1, 2007-Sept. 30, 2008**

#### **Project Description**

NASA's Digital Learning Network™ began in the spring of 2003 with three Hub Sites ( NASA Glenn, NASA Johnson, and NASA Langley) that provided leadership and guidance in the expansion of the network to include all NASA education offices associated with its 10 field centers and NASA Headquarters. NASA's Digital Learning Network™: •fosters the effective use of interactive instructional technologies through the delivery of NASA educational content for the benefit of its students and educators. •promotes collaborative activities among its member sites in order to optimize learning experiences for its students and educators. •encourages open communication among its member sites so that expectations, limitations, strengths, and weaknesses can be objectively addressed for mutual improvement and positive development. •provides timely responses to internal and external inquiries about technical issues, content development and delivery, and event scheduling. •encourages innovation and experimentation by its member sites with the expectation that instructional integrity is maintained and NASA educational goals and standards are upheld. •strives to reach targeted populations associated with the NASA Explorer Schools Program and other NASA distance learning initiatives that target underserved populations while providing access to appropriately equipped members of the general education community. •participates in the development of an agency-wide infrastructure that makes use of existing and emerging interactive instructional technologies. •contributes to the professional development of internal and external educators through distance learning-based events.

#### **Project Goals**

The goal of NASA's Digital Learning Network™ is to enhance NASA's capability to deliver unique content by linking customers with one or more NASA Centers in an integrated fashion. This coordinated digital learning network leverages NASA's unique content, facilities, and personnel so that we can provide students and educators at the precollege and university levels across the Nation and around the world with unique experiences. Learners at all levels have the opportunity to interact directly with NASA engineers, scientists, and education specialists to gain a new appreciation for the importance of science and education.

#### **Project Benefit to Outcome 1, 2, or 3:**

We have extended NASA's reach in a very cost-effective way

- Events: **FY 07 – 2565, FY08 - 3129 reflects 18% increase**
- Numbers of students and teachers reached has grown by 13% from FY 2007-2008. : **FY 07 =107,667 FY08=124,381**
- Total spent on each person served in FY08 - \$14.15.
- Total number of website hits in FY 08 (first year we began to collect this data) - 112,362 = \$1.87/hit
- Students expressing interest in STEM careers (rating on a scale of 1-5)
  - **FY 07 - (25 total students completing the evaluation)** BEFORE: Science 3.25 BEFORE: Technology 3.21 BEFORE: Engineering 2.92 BEFORE: Mathematics 3.21 BEFORE: Geography 2.5 AFTER: Science 4.13 AFTER: Technology 3.88 AFTER: Engineering 3.21 AFTER: Mathematics 3.25 AFTER: Geography 2.92
  - **FY 08 - (3091 participants completing evaluation)** BEFORE: Science 3.28 BEFORE: Technology 3.33 BEFORE: Engineering 2.79 BEFORE: Mathematics 3.28 BEFORE: Geography 2.88 AFTER: Science 4.18 AFTER: Technology 4.09 AFTER: Engineering 3.59 AFTER: Mathematics 3.85 AFTER: Geography 3.58

#### **Project Accomplishments:**

- DLN/education outreach partnerships: -INSPIRE presentations -NES sustainability conference presentations
- Lunar Challenge training events
- Monthly EPD events piloted internally - starting in September 2008 - released for the general public via webcasting
- Developed 50th anniversary events: -Special event series – NASA Center pairings showing a common study interest and how these interests were being applied to future missions.
- Development of the International Happy Birthday NASA party with Discovery Education and USDLA to air on Nov. 13, 2008.
- Discover NASA and You module for consistent offering throughout the year.
- Equipment purchases to equalize production needs for each center upgrading Tricaster units. –
- Cross training in module delivery so time zones would be equally represented allowing more educators options for signing up for more modules.
- CILC recognizes ARC DLN as a Pinnacle winner with KSC and JSC as runner-ups. –

- JPL features Phoenix in special event from their studio and through webcast –
- Focus groups conducted with three hub centers and results analyzed. Information will be used for further project direction (Focus Group Final Report Attached).

#### **Project Contributions to Part Measures:**

1) Percentage of elementary and secondary educators using NASA content-based STEM resources in the classroom WHAT: Number of teachers registered for and completing DLN events for students How: DLN admin system report WHEN: Upon close out of completed events

- **DATA: (Oct-Sep FY 08) 15,491 (Oct-Sep FY 07) 14,771**

2) Percentage of elementary and secondary educators who participate in NASA training programs who use NASA resources in their classroom instruction. WHAT: Number of educators participating in DLN “professional development/educators involvement” events. Example: DLN Overview and Showcase. Difficult to track how many may end up using the DLN in their classes. HOW: DLN admin system report When: Upon close out of completed events

- **DATA: (Oct-Mar FY 08) #'s of educators served in FY 08 Oct.1-Sep 30 through Workshops: 4463 = 28% total viewership #'s of educators served in FY 07 Oct.1-Sep 30 through Workshops: 4161 = 28% total viewership**

3) Percentage increase in number of elementary and secondary student participants in NASA instructional and enrichment activities. WHAT: Number of students in DLN events as indicated by teachers at the end of each event and updated when the event is closed out in the system. HOW: Automated data collection system that captures daily activity and is compiled and checked for accuracy during the event close out process performed by DLN Coordinators. WHEN: Upon close out of completed events

- **DATA: (Oct-Sep FY 07 and 08) FY 07 - 92,896 FY 08- 108,970 Increase in viewership - 15%**

4) Level of student interest in science and technology careers resulting from elementary and secondary NASA education programs. WHAT: NEEIS DLN Student Feedback form (see below) HOW: before and after, 5-point scale on student feedback form. WHEN: Upon completion of DLN Module

- **Rate your level of interest in the following areas before and after participating in the Program, using a scale of 1-5, where 5 is the highest. DATA: (Oct-Sep FY 08) BEFORE: Science 3.28 BEFORE: Technology 3.33 BEFORE: Engineering 2.79 BEFORE: Mathematics 3.28 BEFORE: Geography 2.88 AFTER: Science 4.18 AFTER: Technology 4.09 AFTER: Engineering 3.59 AFTER: Mathematics 3.85 AFTER: Geography 3.58**

5) Dollar invested per number of people reached via e-education technologies. WHAT: DLN admin system report WHEN: Upon close out of events HOW: Total number of videoconference participants

- **DATA: (Oct-Sep FY 08) Total number of website hits in FY 08 (first year we began to collect this data) - \$112,362 = \$1.87/hit**

**Improvements Made in the Past Year:**

Assistant Manager hired to assist Project Manager with actions necessary to insure DLN project success. Cross training of more popular modules in order to spread the module opportunities across time zones and therefore make them more accessible. New module development based on needs assessments from NASA Explorer Schools teachers. New modules are submitted to COTF for evaluation under their educational products review. Electronic Professional Development events piloted to internal NASA education customers. From this pilot a new season was launched in Sept. 2008 broadcast to the general education public as an interactive webcast where questions about the project/presentation were addressed during the live show. DLN site upgrades that make the site more user friendly for our customers.

**Project Partners and Role of Partners in Project Execution (for follow up):**

TBD