



Co-op & Internship Programs for Federal Agencies:

Examples of how and why from NASA's educational portfolio

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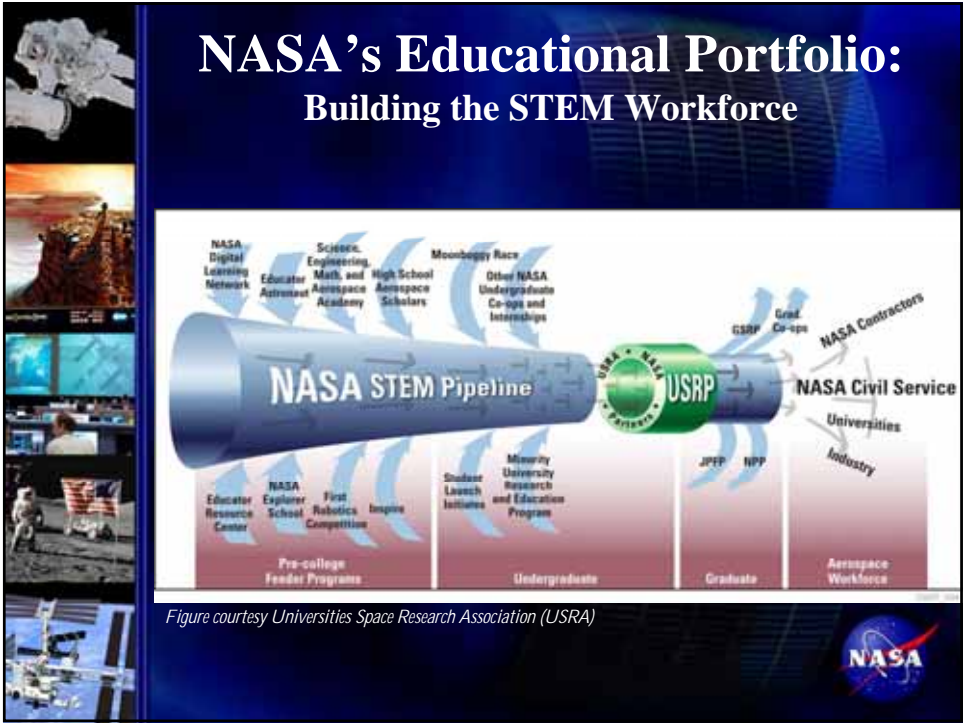
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Agenda

- Points of Discussion
 - Funding Mechanisms
 - Outcomes (return on investment)
 - Best Practices (leveraging technology)
- Example Programs
 - Education Associates
 - Co-op
 - Undergraduate Student Research Program (USRP)





NASA's Educational Portfolio: Experiential Education (Higher Ed)

- Co-op Programs (430 students in 2008)
 - minimum 3 rotations
 - undergraduate & graduate
 - civil service
- Internship Projects (approx. 1950 students)
 - one-time deal - undergrad focus
 - stipend paid -contractor managed
 - summer focus**



Funding Mechanisms

- Agency-wide & Center-specific
- Education Office, HR, Mission Directorates & Technical Orgs
 - (1) stipend-paid through non-profit 3rd party
 - mentor funded
 - agency funded
 - (2) fixed-length employment
 - center funded



Program Outcomes

- Expanding the STEM pipeline
- Generating a thoroughly vetted, specifically qualified, and enthusiastic pool of future candidates.



Immediate Outcomes:

- **Student Learning**
 - Cognitive (skills, knowledge, experience)
 - Affective (confidence, commitment, perspective)
- **Work Produced**
 - Useful work for organization





Processes & Best Practices

Challenges in managing student experience programs:

- Generating suitable pool of student candidates
- Selecting the right students
- Tracking offers, acceptances, and processes for bringing the students on-board.
- Collecting projects and mentors
- Selecting the right mentors
- Documenting outcomes and “ROI” metrics


We are really talking about manpower issues.



Example Programs

1. Education Associates 
2. Johnson Space Center Co-op 
3. Undergraduate Student Research Program







Example 1: “Pay as you go” Internships

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- Center-specific – Ames Research Center
- Each internship funded by PR from mentor
- Non-profit manages program, pays stipends
- **Scope** -- Undergrads, graduate students, or faculty from any US college or university plus post-docs
- **Continuous** -- Year-round program no deadlines. Start/stop anytime; full- or part-time, from 2 to 12 months, any discipline

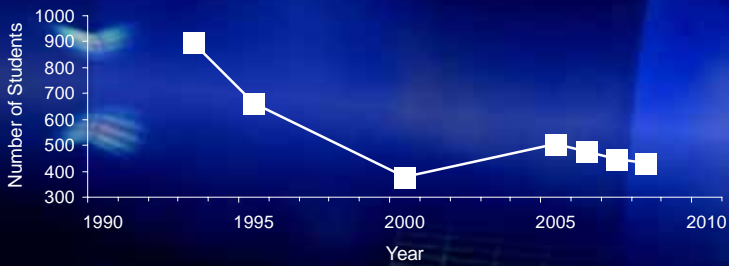
This is a mentor-driven program, emphasizing flexibility and rapid response.

Example 2: Cooperative Education Programs


- Historically – NASA’s top source for “fresh-out” technical hires


NASA Co-op Programs



| Year | Number of Students |
|------|--------------------|
| 1993 | 900 |
| 1995 | 650 |
| 2000 | 380 |
| 2005 | 500 |
| 2006 | 480 |
| 2007 | 450 |
| 2008 | 430 |

- Students are civil servants - typically GS-4, 5, or 6
- Do count against center labor-dollars, but not “head-count” limits









NASA Co-op Programs

- Center-specific, HR managed programs
- Johnson Space Center – NASA’s largest program

| FY 2008 Data | Co-op Numbers | |
|-----------------|---------------|-----------|
| | Year | Fall |
| Ames | 21 | 15 |
| Dryden | 29 | 9 |
| Glenn | 39 | 15 |
| Goddard | 51 | 31 |
| Johnson | 148 | 45 |
| Kennedy | 56 | 16 |
| Langley | 38 | 35 |
| Marshall | 40 | 14 |
| Totals | 430 | 177 |



Example 3: *Undergraduate Student Research Program (USRP)*

- NASA’s largest agency-wide internship program
 - 319 internships in 2008
 - 12 NASA facilities participating
- Open to Engineering and Science Undergraduates
 - Sophomores through Seniors.
- Funded by NASA HQ through cooperative agreement with Universities Space Research Association (USRA)
 - Students paid stipend with travel supplement
- Year-round program with spring, summer, and fall sessions
 - Spring & Fall internships - 15 weeks
 - Summer internships - 10 weeks





Program Outcomes

1. Generating a thoroughly vetted, specifically qualified, and enthusiastic pool of future candidates.
- nothing beats co-op in accomplishing this goal.

Johnson Space Center Co-op Program Hiring Data 2005-2008

| Number Graduating | Offers | | Acceptance |
|----------------------|--------|------------|------------|
| | Job | Grad Co-op | Rate |
| 59 | | | |
| 50 | 33 | 8 | 73% |
| 53 | 41 | 5 | 78% |
| 57 | 50 | 3 | 78% |



Program Outcomes Return on Investment

Immediate Outcomes:

- (1) Student Learning
 - Cognitive (skills, knowledge, experience)
 - Affective (confidence, commitment, perspective)
- (2) Work Produced
 - - Useful work for organization

By asking the right questions on student & mentor surveys we can estimate the value of student learning and work produced.

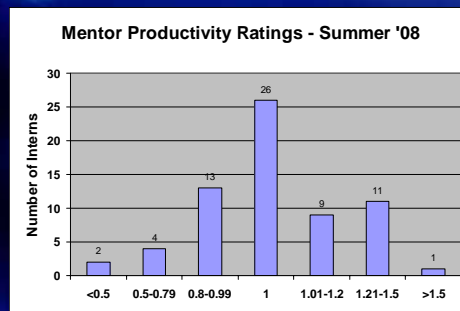




Metric #1: Estimating the value of work produced

Mentor Survey Question

“In an attempt to quantify the overall value of the work produced by this intern to your organization, please estimate the relative percentage you would assign this students' overall productivity relative to a typical fresh-out (recent graduate) new hire in your organization.”



Metric #1: Estimating the value of work produced

Student Productivity =
average mentor response x
average starting salary + benefits x
total length of internships

My experience leads me to conclude –

“Any reasonably well-conceived undergraduate internship or co-op program will show a net profit from this outcome alone.”



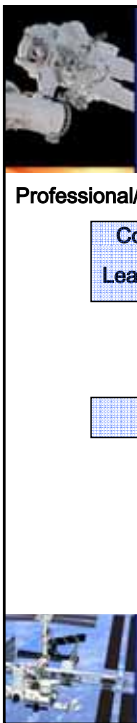


Metric #2:

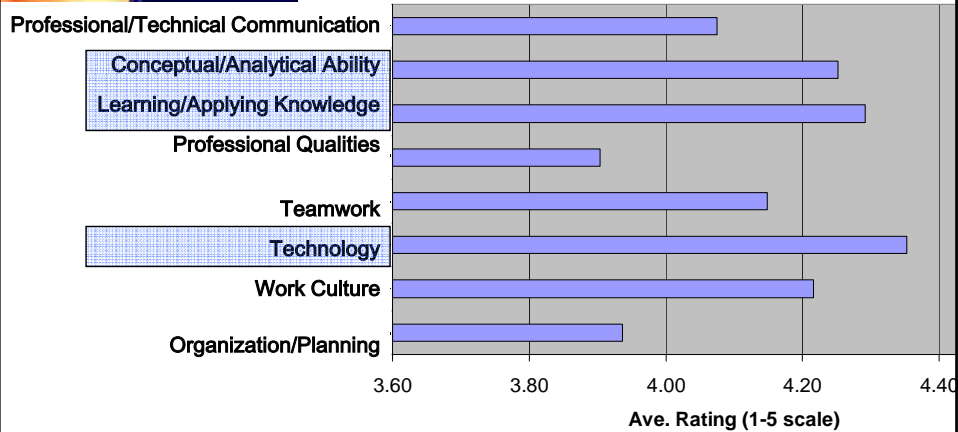
Estimating the value of learning generated Student Survey Question

“Please relate the total value (educational learning, professional growth, etc...) of your internship experience to the value you get from a typical semester, or quarter, at your institution. Please quantify your answer in terms of credit hours.”

Based on 170 responses out of 319 internships, learning produced is 4000 credit hours.



Cognitive vs Affective Learning





Best Practices

Benefits of improving processes

USRP Internship Program

- Implemented Web-based processes
 - student application
 - collection of mentor projects
 - selection of students
 - electronic offer and acceptance tracking
 - student & mentor exit surveys
 - submission of technical reports





Generating Applicants

- Marketing Strategy
- Coherent Message
- Good Website





Find Your Vision
Go to
www.epo.usra.edu/usrp



Benefits of improving processes

USRP 1st Year Accomplishments

- Results of improved processes.....
 - Summer applicant pool = 2,412 (321% increase)
 - Fall applicant pool = 478 (550% increase)
 - Over 200 mentors have submitted projects
- Increased size of program
 - 319 total internships (229% increase)
 - 170 Fall/Spring internships (566% increase)

Highlights of Discussion

- **NASA generates over 2000 internship, fellowship and co-op experiences each year.**
- **Retention of STEM students into the NASA workforce is the ultimate goal – but documentation can be difficult.**
- **Immediate outcomes such as student learning and productivity are easier to document and can generate strong metrics for justifying internship or co-op programs**
- **Leveraging web-based software can greatly reduce the challenges in managing and documenting student programs.**
- **Opportunities exist to partner with NASA and leverage the existing processes for the USRP internship program.**

