Internships at Johnson Space Center

Frank Prochaska
JSC University Affairs Officer
Internships?

Benefits of Internships

Internships at NASA-JSC
Internships at JSC

- In FY10, over 2,200 students from about 600 unique universities applied to Johnson Space Center.

- JSC’s Higher Education Office significantly contributed to the JSC workforce by placing over 300 interns in engineering, science, administrative, and clerical positions, which equaled the work of 100 full-time employees.

- 36 of those students were funded by Space Grant.
JSC continues to excel at matching students to opportunities leading to high levels of performance which:

(a) generates high levels of learning leading to increased confidence generating...
(b) a greater impact on the retention of students through graduation and into STEM careers and...
(c) strong immediate metrics benefiting mentors & students.
Projects

The Crew Exploration Vehicle Parachute Assembly System (CPAS) (EA)
- CPAS project is responsible for the design, development, fabrication, qualification and delivery of the main CEV parachute system to support the pad/ascent abort tests and the first three orbital flight tests.

Morpheus (EG)
- Morpheus is a vertical test bed vehicle demonstrating new green propellant propulsion systems and autonomous landing and hazard detection technology.
- Designed, developed, manufactured and operated in-house by engineers at NASA’s Johnson Space Center, the Morpheus Project represents not only a vehicle to advance technologies, but also an opportunity to try out “lean development” engineering practices.
Multi-Purpose Crew Vehicle (Orion-MPCV)

- The Orion MPCV features dozens of technology advancements and innovations that have been incorporated into the spacecraft's subsystem and component design.
- The Orion MPCV spacecraft includes both crew and service modules, a spacecraft adaptor, and a revolutionary launch abort system that will significantly increase crew safety.
Student Quotes

NASA’s reaffirmed my faith in STEM!

Totally life changing!

I got to be a part of a little piece of someone possibly setting foot on MARS!

Absolutely incredible!

Extremely rewarding!

You feel so much pride when you work on something that becomes important!
Intern Presentation

http://www.youtube.com/watch?v=iMru2mQY50g
JSC Office of Education

What we do:

- Work with mentors to identify opportunities for students
  - Understand opportunity requirements (major, education level etc.)

- Work with funding sources (including Space Grant Consortia)
  - Understand funding source requirements (eligible students funding capacity etc.)

- Interview and select students

- Oversee Internship experience
  - Orientation
  - Exit presentation
  - Resume and interviewing classes
  - Intern awards

- Work with HR and other Student programs for pipelining opportunities
SOLAR System
Student Online Application for Recruiting Interns, Fellows & Scholars

One Stop Shopping Initiative

One NASA system
One submitted application
One amazing opportunity

http://intern.nasa.gov
Benefits of Internships

Student programs, such as internships or co-op, generate positive outcomes in three general areas.

1. Technical Productivity – useful technical work benefiting the agency
2. Student Learning – cognitive (skills) and affective (confidence, commitment) growth
3. Retention – expanding STEM pipeline, growing future workforce
Technical Productivity  
Jan. ‘08 – Aug ‘11

Student Productivity – useful technical work

• 732 mentor surveys (55%)
• Student productivity *compared to fresh-out hire*

Value ($$$) = mentor rating \( \times \)
\[
\text{total length of internships} \times \text{(average starting salary + benefits)}
\]

• Result: 104%
• Value: $28M (or 372 FTE)
• Productivity ROI of $2 for each $1 spent
Why are Internships Beneficial for Students?

1. **Technical Productivity** – useful technical work benefiting the agency

2. **Student Learning** – cognitive (skills) and affective (confidence, commitment) growth

3. **Retention** – expanding STEM pipeline, growing future workforce
Benefits to Students

- Paid work experience in student’s field of study
- Student establishes a relationship with NASA
- Up-to-date information on industry trends
- Educates students on how to properly research, present, promote and possibly publish a finished product
- Better Prepared for Career Success

- Fosters creative thinking in a professional environment
- Generates high levels of learning leading to increased confidence
- Increase Academic Motivation
- Commitment to STEM Career
### Areas of Growth:

<table>
<thead>
<tr>
<th>Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Self-Confidence</td>
<td>97.6%</td>
</tr>
<tr>
<td>Understand Strengths/Weaknesses</td>
<td>96.3%</td>
</tr>
<tr>
<td>Clarify Career Plans</td>
<td>96.9%</td>
</tr>
<tr>
<td>Increase Academic Motivation</td>
<td>96.4%</td>
</tr>
<tr>
<td>Commitment to STEM Career</td>
<td>95.5%</td>
</tr>
<tr>
<td>Better Prepared for Career Success</td>
<td>97.6%</td>
</tr>
</tbody>
</table>

This internship helped to prepare me to achieve my career goals in STEM.
Why are Internships Beneficial for Universities?

1. **Technical Productivity** – useful technical work benefiting the agency

2. **Student Learning** – cognitive (skills) and affective (confidence, commitment) growth

3. **Retention** – expanding STEM pipeline, growing future workforce
Student Learning

Jan. ‘08 – Aug ‘11

Student Learning: cognitive (skills) & affective (attitude)

*results based on 878 student surveys (78%) from Spring ‘08 – Spring ‘11

Areas of Growth:

<table>
<thead>
<tr>
<th>Area</th>
<th>“Yes”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional/Technical Communication</td>
<td>97.7%</td>
</tr>
<tr>
<td>Conceptual/Analytical Ability</td>
<td>98.5%</td>
</tr>
<tr>
<td>Learning/Applying Knowledge</td>
<td>98.1%</td>
</tr>
<tr>
<td>Professional Qualities</td>
<td>97.8%</td>
</tr>
<tr>
<td>Teamwork</td>
<td>93.4%</td>
</tr>
<tr>
<td>Leadership</td>
<td>87.2%</td>
</tr>
<tr>
<td>Technology</td>
<td>96.9%</td>
</tr>
<tr>
<td>Work Culture</td>
<td>98.0%</td>
</tr>
<tr>
<td>Organization/Planning</td>
<td>96.7%</td>
</tr>
</tbody>
</table>

Students equate their USRP experience to roughly to 14 cr. hrs. of technical coursework.
Retention

- 100% graduation rate
- 98% retained in the STEM pipeline
Pop Quiz: Why are Internships Good?

A) Internships provide businesses with Technical Productivity
B) Internships increase Student Learning
C) Internships generate positive Retention
D) All of the above
E) They aren’t endorsed by Emperor Palpatine
Correct Answer = E

- Emperor Palpatine does not like them (he was thrown into the main reactor of the Death Star by his intern) and since everything the Emperor does is evil = the Correct Answer is E
QUESTIONS

JSC Education Program:  
http://education.jsc.nasa.gov
How Should Colleges Assess And Improve Student Learning?

Employers’ Views On The Accountability Challenge

A Survey Of Employers Conducted On Behalf Of:
The Association Of American Colleges And Universities

By Peter D. Hart Research Associates, Inc.

January 9, 2008

Embargoed For Release January 22, 2008, 10:30am
Most employers indicate that college transcripts are not particularly useful in helping evaluate job applicants’ potential to succeed at their company.

How useful do you find the college transcript in helping you evaluate job applicants’ potential to succeed at your company?

- Not sure: 4%
- Very useful: 13%
- Not useful: 33%
- Fairly useful: 16%
- Just somewhat useful: 34%
...employers have the most confidence in assessments that demonstrate graduates’ ability to apply their college learning to complex, real-world challenges, as well as projects or tests that integrate problem-solving, writing, and analytical reasoning skills.

<table>
<thead>
<tr>
<th>Assessments’ Effectiveness In Ensuring College Graduates Have Skills/Knowledge</th>
<th>Very effective</th>
<th>Fairly effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervised/evaluated internship/community-based project where students apply college learning in real-world setting</td>
<td>69%</td>
<td>83%</td>
</tr>
<tr>
<td>Advanced comprehensive senior project, such as thesis, demonstrating student’s depth of knowledge in major &amp; problem-solving, writing, and analytic reasoning skills</td>
<td>46%</td>
<td>79%</td>
</tr>
<tr>
<td>Essay tests to evaluate level of problem-solving, writing, and analytical-thinking skills</td>
<td>35%</td>
<td>60%</td>
</tr>
<tr>
<td>Electronic portfolio of student’s college work, including accomplishments in key skill areas and faculty assessments</td>
<td>33%</td>
<td>56%</td>
</tr>
<tr>
<td>Multiple-choice tests of general content knowledge</td>
<td>7%</td>
<td>32%</td>
</tr>
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