AC 2007-2402: FALL SPACE DAY – AN EDUCATIONAL OUTREACH AND PROFESSIONAL DEVELOPMENT PROGRAM MODEL

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Fall Space Day – An Educational Outreach and Professional Development Program Model

Abstract

An emerging aspect of engineering outreach is service-based learning and outreach. In the service learning model, university level students take active and leading roles in community-based outreach activities. For over 10 years, Purdue's Fall Space Day (PFSD) has been a successful outreach program to excite third through eighth grade school students about science, technology, engineering, mathematics (STEM) and space-related careers. PSFD was developed by the Purdue University chapter of the Students for the Exploration and Development of Space (Purdue SEDS) and has been sponsored annually by the Purdue University School of Aeronautics & Astronautics and the Indiana Space Grant Consortium (INSGC). Inaugurated on Saturday November 9, 1996, approximately 3000 grade school students have benefited from PFSD and approximately 900 university students have volunteered their time. PFSD 2006 was held on Saturday November 11 and welcomed 500 third through eighth grade school students to Purdue's campus, a significant increase from the 150 grade school students who attended the first program in 1996.

Purdue Fall Space Day has gained recognition across the state of Indiana as an exceptional space-related educational outreach event. Since its inception, PFSD has been developed and run by undergraduate students, except for very limited staff involvement (0.5 FTE) to perform university-required budgetary tasks. Sponsorships enable PFSD to provide an entire day's worth of space, science, and engineering centered, age-appropriate hands-on activities for third through eighth graders at no cost to the participants. This provides the students an opportunity to see the technical challenges associated with space flight. All activities are taught by university students and are accompanied by lesson plans designed to facilitate the children's understanding of space technology and exploration.

In addition to the third through eighth grade school students benefiting through PFSD participation, the university student volunteers gain valuable experiences that remain with them long after their time as Purdue students. These experiences include providing a community service as a role model and learning the organizational, project supervision, and professional development tasks required to plan and implement a successful PFSD each year. Parents and teachers are exposed to the excitement of spaceflight through the eyes of their children and students, respectively. The University shares the quality of its campus and student volunteers with the community and benefits from the future enrollment of PFSD participants as university students.

Assessment results received from surveys filled out by the students, parents, and volunteers are integrated into the next PFSD program thus benefiting from lessons learned and sustaining PFSD for the next generation. Ten years of experience, assessment, and lessons learned have been compiled by PFSD alumni and staff as an ongoing resource base for succeeding PFSD leadership teams. As the success of PFSD has grown, other campuses in Indiana and elsewhere have expressed interest in developing the program at their location. The evolution of PFSD is therefore now addressing controlled expansion to other universities within the State of Indiana.

Introduction

For decades Purdue University students have come together to inspire the next generation. One specific program, Purdue Fall Space Day (PFSD), is now in its twelfth year and is an opportunity for students in grades three through eight to come to the Purdue campus and learn about astronautical engineering and space exploration with the university student volunteers. Purdue Fall Space Day has gained recognition across the State of Indiana as an exceptional space-related educational outreach event. This high profile event reflects well on Purdue University and the event's sponsors and receives significant media coverage. In order to allow other universities across the globe to learn about PFSD and successfully implement their own student-led service education event based on the PFSD model it is important to share the PFSD model, including ideas for funding through grant proposals and business sponsorship, and the lessons learned in sustaining PFSD.

Fall Space Day Overview

The basic premises behind the Purdue Fall Space Day program was to provide local students (within 50 miles of the university campus) an opportunity to become excited about or increase their enthusiasm for the nation's space program through hands on activities interaction with an astronaut. The Fall Space Day founder was raised in Northern Indiana and was energized about the space program. In her senior year of high school, the founder was excited about a rare opportunity to hear an astronaut speak in person about his space experiences. As a sophomore engineering student, the founder developed the idea to create Fall Space Day, thereby enabling students from the surrounding area to feel the excitement and energy that surrounds space exploration and engineering through opportunities the current college students only dreamed about.

Organized by university students, Purdue Fall Space Day is an annual educational outreach program held on a Saturday, which provides grade school students the opportunity to learn about science, technology, engineering, math and space exploration by participating in age-appropriate activity sessions. PFSD was inaugurated on Saturday November 9, 1996 by the Purdue University chapter of the Students for the Exploration and Development of Space (SEDS) and has grown to accommodate over 500 third through eighth grade students with volunteer support from over 160 university students representing over 28 majors. Since 1996, over 3000 grade school students have participated in PFSD with support from over 900 university student volunteers, high school students and university staff.

For logistical reasons, PFSD is held on a Saturday in late October or early November when there is an away football game. Third through eighth grade students from surrounding counties arrive early in the morning for registration, meet their groups in the lecture hall, and excitedly await the official start of the event. The students are organized into groups of approximately 20 students which area each assigned a university student Group Leader. The groups are split into the following grade ranges: 3-4, 5-6, and 7-8. The Group Leader is responsible for spending the day with the students as they move from one activity to the next. The safety of the students is the responsibility of the Group Leader who has a sign in/out sheet which is used to release the students for both lunch and at the end of the day to their parents and chaperones.

To many, the highlight of the day is the attendance of a Purdue Alumnus Astronaut who starts PFSD with a presentation providing the students first hand information about his/her space flight experience. Purdue University has played a leading role in providing the nation with engineers who have designed, built, tested and flown the many vehicles that have changed the face of space exploration during the 20th Century and at the beginning of this second century of flight. Purdue University is justifiably proud to be known as the "Cradle of Astronauts", and has now produced 22 graduates to be selected as NASA astronauts.

Past guest astronauts include**:** John Blaha, Mark Brown, John Casper, Guy Gardner, Greg Harbaugh, Gary Payton, Loren Shriver, Janice Voss, and Don Williams. Astronaut Charles Walker has graciously accepted the invitation for the 2007 event to be held on November 3. The astronaut stays throughout the event interacting with the student participants as they continue the day in their activity sessions, and finishes the day by providing a motivational talk to the university students. Additionally, the astronaut provides a public presentation the night before the event for the local community. This presentation has become increasingly popular each year and is always well attended and free of charge, thus demonstrating the great interest in the nation's space program and astronauts.

All student volunteers wear a brightly colored PFSD T-shirt with that year's Mission patch, which identifies them to the school students. In addition for being a safety aspect, the school students are encouraged to ask the student volunteers questions, and thus are looked as role models by the younger students. These T-shirts also promote a sense of unity amongst the university students. The back of the T-shirt is utilized to recognize the sponsors for which make it possible to offer PFSD free of charge to the students.

The students participate in three unique hands-on activities with the intention of sparking their interest in science, technology, engineering and math (STEM). This provides the school students an opportunity to see the technical challenges associated with space flight. All activities are accompanied by lesson plans to facilitate the children's understanding of basic engineering concepts. These lesson plans are published in the student's handbook. A sample of past activities is identified in Table 1.

Table 1: Purdue Fall Space Day Student Activities

Grades 3-4	Grades 5-6	Grades 7-8
Air Engines	Nanorovers	Phone Home
Edible Moon Rover	Rocket Rovers	Satellite Launch
Film Canister Rockets	Space Shuttle Gliders	Solar Rovers
Paper Airplanes	Straw Rockets	Water Rockets
Kites	Return to Earth	Mars Rovers Ops

The day is organized so the event can start promptly at 9:30 a.m. and finish at 3:15 p.m. This includes a lunch period where the parents or chaperones are responsible for the student participants. Each activity is 45 minutes in length, with a 15-minute period in between each activity session to allow sufficient time for the group leaders to move the students to their next activity location. This time frame ensures that the activity can be accomplished, but is not long enough for the children to lose interest in the activity.

The First Fall Space Day

Purdue Fall Space Day held its first event on November 9, 1996, although the planning began in February of 1996. Three university organizations worked together to put on the event; Purdue SEDS, the Purdue Engineering Student Council (PESC), and the Purdue student chapter of the American Institute of Aeronautics and Astronautics (AIAA). SEDS was responsible for the overall planning of the event, AIAA helped supply volunteers, and PESC was responsible for the registration process. The spring of 1996 focused on acquiring funding through writing and submitting grant proposals to a number of aerospace companies that offered aerospace educational outreach funds.

With a budget of under $5000, the student organizers were able to offer a full day of space related activities on the Purdue campus free of charge to 120 third through twelfth grade students. The budget was used to pay for the astronaut's travel and lodging expenses and pay for the T-Shirts that were designed by the organizers to commemorate the inaugural Fall Space Day and were provided to all of the attending students and college student volunteers. The purpose of the T-Shirt was to provide a tangible reminder to the attending students of their unique aerospace experience at Purdue.

The first Fall Space Day was held prior to the availability of internet we have come to take for granted in both schools and homes. In August of 1996 the founder developed information packets and registration forms, which required printing and stuffing into envelopes before being mailed to elementary, middle, and high schools within a 50 mile radius of the Purdue campus. Before clip art was such an everyday phenomenon with Microsoft Word, pictures of rockets were cut out and taped on the registration forms to create the feel of the event. Within weeks, the 150 student slots were filled and a waiting list was quickly formed. The largest number of students registered in the third to fifth grade age level while the smallest registration interest was in the ninth to twelfth grade age level.

Over the course of many months the organizers gathered age-appropriate space based lessons that could be taught to the following age groups: 3-5, 6-8, 9-12. Activity books where developed by the founder for each grade range that included information about Fall Space Day, their specific group schedule and activities, the presenting astronaut's biographies, and educational space activities to take home. These books were printed and put together by the volunteers in the days leading up to Fall Space Day. The student participants found themselves engaged in three activities over the course of the day after attentively listening to presentations by two astronauts, Don Williams and Gary Payton. One session for the 9-12 graders was devoted to learning about Purdue and the Engineering Curriculum allowing for dialogue between an Aeronautical & Astronautical Engineering Professor, numerous engineering students, and the

high school student participants. Not only the materials needed for the activities, but also lunch and giveaways were donated by businesses surrounding the Purdue Campus in West Lafayette, Indiana.

Evaluation of Program

Over the last year, through the Indiana Space Grant Consortium, PFSD has partnered with the Purdue College of Education to examine ways to develop a comprehensive evaluation plan for PFSD. These evaluations will continue to be refined and expanded and the use of evidence provided will improve both effectiveness and the program.

Grade school Students and Parents

Evaluation sheets are distributed to all grade school students to complete. These evaluations contain background details on each of the school students including gender; grade; school attended; and how they heard about the event. Optional questions on ethnicity are also included.

For the 2006 event PFSD actively sought underrepresented school age students and worked closely with the Science Bound Program which is a partnership between Purdue University and the Indianapolis Public Schools. (IPS) Initiated in 2001, Science Bound is a program that helps underrepresented students to earn full scholarships to Purdue to study for a career in engineering, science, and technology and math/science education. Twenty Science Bound Program students attended in 2006.

Table 2 shows the replies on ethnicity from the 2006 event. From the 503 school students who attended the event, 215 school students completed the section on ethnicity.

Table 2: Purdue Space Day 2006 – Results of ethnicity questions

Grade	White	Black	Asian	Multiracial	Hispanic	Nat. Ameri	Other	Total
Grade 3-4	87	3	4	0	2	0	3	99
Grade 5-6	74	2	1	1	0	0	3	81
Grade 7-8	33	0	1	0	1	0	0	35
Totals	**194**	**5**	**6**	**1**	**3**	**0**	**6**	**215**

The school students are also asked to score each of the three hands-on activities on a rating of 1–5. (1 being the lowest score) Each year, new activities are included in the event, and this information gives an indication of how the activity is received and how successful it has been. There is also an opportunity for both general comments and their interests in careers in science, engineering and the possibility of attending Purdue University. Parents and teachers also have an opportunity to give comments about the day which have always resulted in very positive comments. Atypical quote from a parent is as follows:

I wanted to thank everyone involved for a wonderful program Saturday. I brought my son, Nick, for the first time and he had a great day. It has opened his mind and he is now thinking of designing airplanes for a living and coming to Purdue to learn how. Thanks so much - Jennifer

As the program is now in its twelfth year, we are also interested to know if any of the student volunteers attended the program when they were in grade school and if by attending PFSD, it had any bearing on their plans after graduation from high school. To date, we have had response from only one freshman student, but this is an area that we will concentrate on more in the future.

Demographic Details of Grade School Students from Evaluations

Although more male school students attend PFSD, we have found that more females attend in the younger age group of grades 3-5, with the highest number attending in 5th grade. More males attend from grade 6 -8.

Table 3 shows the split between males and females throughout the grades.

Table 3: Number of school students by gender for each Grade for 2006 event

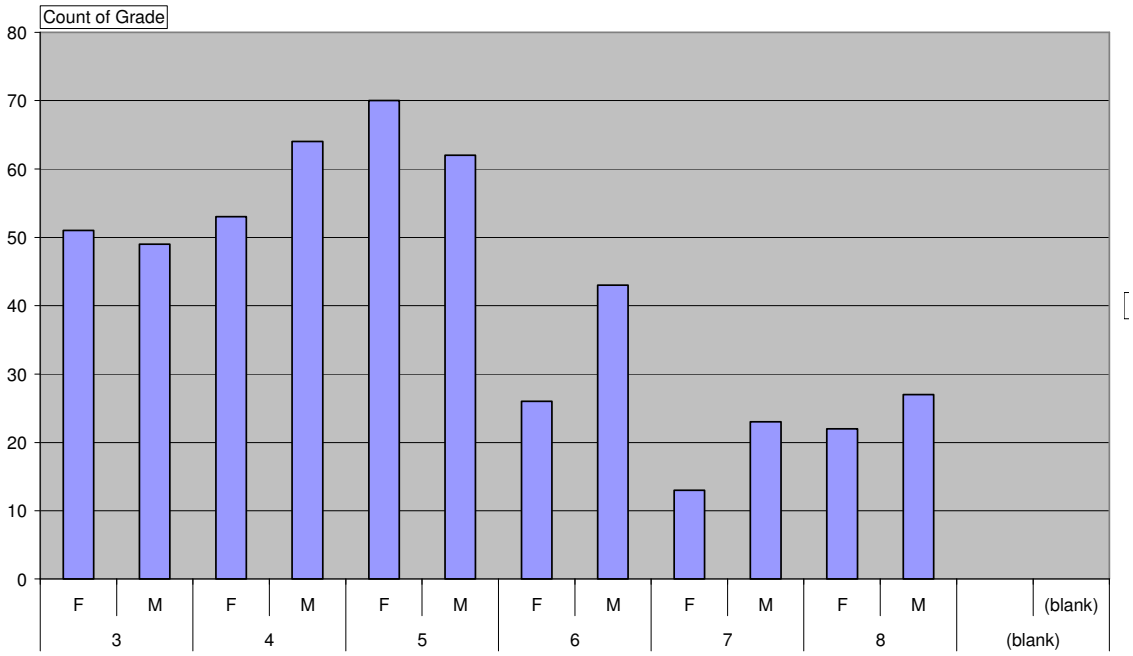

Table 4: Total Count of Gender for 2006 event (school students)

Count of Gender	
Gender	Total
F	235
M	268
Grand Total	503

Purdue Student Volunteers

The event is open to students from any major and 28 majors were represented for the 2006 event, plus 10 high school students who had previously attended the program up until 8th grade and 15 staff from the School of Aeronautics & Astronautics. Although more engineering students especially from the parent school tend to volunteer, students from other disciplines are becoming more involved as the program becomes well known throughout campus.

Specific questions like improvement on student GPA have not been asked on the evaluations; however anecdotal comments from past students have indicated that GPA's are increased as involvement in such a large project leads to better organization and use of students' time.

The student volunteers are given an evaluation sheet which asks a different set of questions on managing a large project, team building and community service.

Following the event, the evaluation sheets are analyzed and a meeting is held where all the committee members can see the results and make comments etc. A document is then drawn up with recommendations for changes to incorporate for the following year. Table 5 shows the distribution by major and Table 6 shows the gender balance.

Table 5: Distribution by Major of volunteers for 2006 event

Count by Major

Name of Major		**Name of Major**	
Aeronautics and Astronautics	77	Mathematics	2
Agricultural & Biological Engr.	2	Mechanical Engr.	7
Agricultural Economics	1	Mechanical Engr. Technology	2
Aviation Technology	1	Management	1
Biochemistry	1	Organizational Leadership & Supervision	2
Biological Sciences	1	Physics	1
Biomedical Engr.	1	Political Science	1
Civil Engr.	3	Pre-Med	1
Construction Engr & Mgmt.	1	Psychology	2
Chemical Engr.	3	Science	3
Chemistry	1	General Studies Technology	1
Earth & Atmospheric Sciences	2	Undergraduate Studies Program	3
Electrical & Computer Engr.	2	**Total of Purdue Students**	**136**
Electrical Engr.	2	High School students	10
First year Engr.	35	AAE Staff	15
Industrial Engr.	3	**Grand Total**	**161**

Table 6: Count of 2006 Gender of Student Volunteers

Count of Gender	
Gender	Total
F	80
M	107
(blank)	
Grand Total	187

Service Learning

Students who are actively involved in the project ensures they have a student voice, this gives them the opportunity to select, design, implement, and evaluate their service activity encouraging relevancy and sustained interest. Also, by being involved in a project that is mainly supported by the School of Aeronautics and Astronautics, these students tend to be more connected with the school and therefore more visible. They are more likely to be called upon to represent the school in other aspects and areas. Their self-esteem and self-confidence rises as they are taking on more responsibility and are proud to represent Purdue.

Longitudinal Tracking

The Purdue student volunteers all take part in longitudinal tracking. Table 7 follows the student volunteers and their plans after graduation. Many Purdue students who have previously been involved with PFSD as an undergraduate also stay with PFSD as graduate students and their experience with the program is shared with undergraduates.

Table 7: Student Plans after Graduation

Plans After Graduation	
Aerostructures Corp. (Nashville, Tn)	Goddard
Air Force	Grad. School - Stanford - NASA/JSC
Air Force Res. Lab. (Edwards)	Graduate Co-op (Spring & Summer 2006)
Applying to graduate school	Graduate School - CalTech
Applying to Medical School	Graduate School - AAE - Purdue
ATK Thiokol, Engr./Scientist.	Graduate School - Stanford
Boeing (Combat Syst), Huntington Beach, CA.	Graduate School MIT
Boeing (Seattle) Moving to NAVAIR 6/02	Johns Hopkins University, Applied Physics Lab
Boeing Integrated Defense Syst., Houston, TX.	Lockheed Martin - Texas
Boeing Integrated Defense Syst., Seattle, WA.	Lockheed Martin (Ft. Worth)
Boeing Phantom Works, Stress Engr.	Lockheed Martin Systems Integration, Owego, NY
Boeing Satellite Systems, Redondo Beach, CA.	Lockheed Martin, Palmdale, CA,
Boeing, Houston, TX. (Aerodyn/Debris Anal.)	MEM program Case Western Reserve Univ. (Ohio)
Boeing, Houston, TX. (Safety Engineer for Shuttle)	NASA-Goddard (co-op) / Grad. Student AAE
Boeing, Huntington Beach, CA., X-37 Proj.,	NASA-Johnson Space Center, Houston,TX.
Boeing, Integrated Defense Syst. Div., St. Louis	NASA-Kennedy
Boeing, Seattle, WA.	National Security Council, MD.
Boeing, St. Louis, and Grad. School Washington Univ.	Navair, Patuxent River, MD.,
Butler International, Design Engr.,	Northrop Grumman, Dyn. Engr.,
Butler/Sikorski	Northrop Grumman/TRW, Orbit Determination
CA. Environmental Agency, Sonoma, CA.	Northrup or Boeing
Continuing for Ph.D.	Pilot Flying School, Phoenix, AZ.
Dynetics	Previous High School Volunteer - Attending Purdue fall 2006
Eclipse Aviation, Flight Test Engr.	Raytheon
Emergent Space Tech.	Rockwell Collins
Epic Systems	Schlumberger Oilfield Services
Frasca	Space Access
GE Aircraft (Toulouse, France) A380 flight program	State Department - Washington, D.C.
GE Energy, Aero Design,	Teach for America Program - High school Math in SD
GEAE (EEDP program), Cincinnati	U.S. Coast Guard
General Electric	United Space Alliance
Georgetown Law School	Vought Aircraft, TX.
	Wright-Patterson Air Force Base

Sustaining Fall Space Day through Incorporating Lessons Learned

Now in its twelfth year, Fall Space Day has evolved into an educational outreach and professional development model that can be used throughout the world with any subject matter. The "Fall Space Day How to Book" was written in order to document how to accomplish the next FSD. Documentation was critical in order to capture the ideal why to delegate the tasks in order to reduce the burden on one person and to allow additional students to take on a leadership role and learn the ropes in order to successfully allow FSD to become an annual event at Purdue University.

In 1998, the Purdue School of Aeronautics and Astronautics hired a part time FSD Coordinator who helped tremendously with the tasks throughout the year. The first coordinator stayed with FSD for four years while the second coordinator is now on her eighth year with the event. Having the same coordinator for a long period of time has turned out to be a vital component of sustaining FSD.

A Planning Committee was developed with volunteers taking on a variety of leadership roles including Director, Treasurer, Activity Head, etc**.** The committee now meets bi-weekly in the spring and a jobs list is drawn up at the start of summer break to solidify ideas and agree to the work that would be accomplished during the summer break.

Once school resumed in the fall, the committee met weekly to communicate open work and accomplishments. This forum is very important to make sure that the tasks, which included developing the lessons and lesson plans, were completed well ahead of schedule for incorporation into the activity books and to allow dry-runs of the lessons to be taught prior to the event.

Two major changes were visible to participants at FSD '98 if they had attended the previous year. The first change was that the program was available to grades 3- 8 because based on surveys and the format of the day their age ranges benefited the most from the event. The second major change was that lunch was no longer provided for the students. The student participants were requested to bring sack lunches which were collected and distributed to them in assigned classrooms during the lunch event. Parents were invited to attend the activity sessions with their children or they could take a tour of the Purdue campus with volunteer Purdue student tour guides.

After the completion of each annual Fall Space Day results of the survey and the lessons learned by the committee and volunteers are incorporated into the planning for the next Fall Space Day. The first Fall Space Day was a very successful event touching the lives of 120 students and 40 volunteers. Besides growing in size every year, reaching out to more students, the committee tried to improve upon the previous event to make it even a better experience for all involved. This improvement while gradual has been instrumental in the sustaining FSD.

The Appendix documents the growth and yearly improvements made which have helped sustain FSD over the past 11 years.

The Result – An Educational Outreach and Professional Development Program Model

In addition to PFSD being a successful educational outreach program, it is also a successful professional development program for university student volunteers. The university students are vertically integrated maintaining a mix of freshman through graduate students each year. The student volunteers are multidisciplinary as the event draws students from across engineering and from other disciplines. Student participation is long term in order to maintain leadership and continuity from one year to the next. PFSD aims to keep those students who have an interest in science and engineering and to expand their interest in a fun, hands-on environment.

PFSD allows university students an opportunity to develop an experiential understanding of project management and integrating engineering systems at multiple levels of aggregation. Thus, PFSD provides substantial workforce development contributions to university science and engineering majors, in addition to its ability to provide K-12 students with an informal STEM education experience.

Under the guidance of a staff coordinator, the PFSD committee works closely over an entire year with their student university student volunteers to define, design, test, and support the systems that the day needs. The results are that PFSD has a significant, lasting impact on:

- The university students who volunteer to run the event
- The grade school students who attend the event
- The greater community who benefit from the event

At Purdue, participation in the event can also lead to qualifying as a Service Project with some classes or organizations. Through this event, the university students learn many valuable lessons. Some of these are:

- Service Learning – This encourages university students to give back to the community
- Role Models – The significant impact that the university students engineering skills can have on the younger generation as teachers and role models.
- Leadership and delegation
- The difficulty of managing and leading a large project
- The need for skills and knowledge for inter-disciplinary co-operation
- The art of problem solving
- Team work
- Valuable lessons in teaching and citizenship

This high profile event reflects well on Purdue University and the event's sponsors and receives significant media coverage. In order to allow other universities across the globe to learn about PFSD and successfully implement their own Space Day, it is important to share the PFSD model, including ideas for funding through grant proposals and business sponsorship, and the lessons learned in sustaining PFSD.

Vertically integrated - A mix of freshmen, sophomores, juniors, seniors, and grad students from many majors is also a factor in the success of the program. The PFSD committee requires a mix of students from different years to maintain leadership and continuity from one year to the next.

A Director, assistant director, treasurer, chair of mission control and the PFSD staff coordinator make up the executive committee. Due to the higher numbers, both the roles of director and assistant director have been split to share the workload.

Multi year participation; The assistant directors need to have at least one-year experience as a general volunteer, group leader or activity head, usually in their freshman or sophomore year. They would then take over as assistant director in their junior year with the role of director in their senior year. This ensures a rolling program with experienced university student volunteers who are able to take the lead and to establish a teaching role in the execution of the program. The combination of a vertically integrated team and long-term student participation ensures continuity, with the new students of freshmen and sophomores recruited to replace graduating seniors and grad students.

Many student university student volunteers sign up at the end of the previous event and have a choice which activity they want to volunteer for. The event is advertised in an evening callout, in undergraduate classes, and on the PFSD web site at the start of the academic year. The Executive committee trains student university student volunteers, collects feedback, and make any reasonable changes to ensure the smooth running of the event in subsequent years. The student university student volunteers then assume responsibility for supporting and maintaining the event for future years.

State-Wide Recognition

Due to sponsorship, PFSD is able to provide an entire day's worth of space, science, and engineering centered activities for third through eighth graders at no cost to the participants. This high-profile event reflects well on Purdue University and the event's sponsors and receives significant media coverage.

Since 1996, over 3,000 grade school students and over 900 university student volunteers have participated in PFSD. The event has grown steadily and has gained recognition both in the Greater Lafayette community and across both Indiana and its neighboring states as an exceptional space-related educational outreach program.

Expansion

After 11 years of touching the lives of 4000 students from elementary to university level, the PFSD founder and current PFSD staff coordinator under support from the INSGC are working to make the FSD model available globally. The success of PFSD has been shared at that National Space Grant Consortium meetings and a workshop will be held in the future to share the model with other Space Grant Consortiums interested in taking FSD back to their states. An additional

pursuit is the creation of a National Organization based on the success of Purdue Engineering Projects in Community Service (EPICS).

Purdue Fall Space Day Advisory Committee

Under funding from the INSGC, the Purdue Fall Space Day Advisory Committee was formed in September 2006. Past Directors of PFSD were invited to be Founding members and the aim is that this committee will serve an important role in the expansion of PFSD. The success of our program at Purdue depends on strong support from existing students; the success of our program outside of Purdue depends on the support from those who have been through the program and know what is involved in the running of the event and now have knowledge of life "after university"

There are many ways in which help can be given and Purdue University has a wealth of faculty, staff, students and alumni who have both the necessary knowledge and commitment to ensure that the expansion of the Purdue Fall Space Day program proceeds in a measured and professional way.

Geographic Expansion

Under the funding of the Indiana Space Grant Consortium, (INSGC) PFSD will be expanded to serve other educational establishments within the state of Indiana. The existence of PFSD programs at several sites has opened the possibility of addressing community and educational needs that extend beyond those of Purdue University and its local community.

The first multi-site PFSD project will be initiated in 2007 with the University of Evansville through site visits and meetings. In addition Ball State University and the University of Illinois have shown interest in hosting their own Space Days. The local goal for each event is to enable the university to share knowledge and information on the PFSD concept and to encourage educational outreach in local communities. Once these programs have been established, then future expansion to other campuses will continue. Through the INSGC, other states have also expressed interest in expanding this program. The extension of this project could then continue from statewide to a national scope.

Expansion with Alternate Theme Days

An alternate expansion method is to utilize the PFSD model for successful development, and deployment and sustaining of alternate subject area days to be held at university campuses. This type of expansion has the potential to reach a diverse group of grade students around the globe based on the universities academic strengths and the enthusiasm of the university student volunteers. It is planned for this method to be pursued once successful geographic expansion with FSD has been achieved.

Conclusion

Fall Space Day has added a new dimension to the educational experience for undergraduates from many disciplines at the host university. Key features of the program include vertically integrated, multidisciplinary teams and multi-year participation. On the community side, the FSD structure fosters a relationship between Purdue University and its students and schools from the state. On the academic side, this structure provides students with the opportunity to be involved in all phases of the planning and deployment. Most importantly, the structure encourages an extended service-learning experience that spans the campus, with emphasis on providing a model of how university students can use their skills to benefit the community.

Appendix: Purdue Fall Space Day Timeline

Year	Directors	Students	Volunteers	Astronauts	Yearly Improvements
1996	Cindy Mahler	120	40	Don Williams	Registration open to grades 3-12
				Gary Payton	Class groups: Grades 3-5, 6-8, 9-12
					Specialized Activity Books for each section with personalized schedule
					T-Shirts and goodie bags for all students and volunteers
					Breakfast and lunch provided for all volunteers
					Lunch provided for all students and parents
					Campus tour provided for parents
					Lesson dry runs performed week before FSD
					Surveys completed by students and parents
					Organized by SEDS, AIAA, and PESC
1997	Cindy Mahler	230	55	Greg Harbaugh	Created planning committee
					AAE hired part-time FSD Coordinator
					Volunteer Call-Out held at the beginning of the school year in conjunction with SEDS callout
					Registration open to Grades 3-8 only
					Student T-Shirts and goodie bags for all students and volunteers
					Volunteer T-Shirts with smaller FSD design
					Organized by SEDS, AIAA, and PESC
1998	Michael Burke	255	60	Mark Brown	Organized by SEDS and AIAA
	Sherri Spreadbury				
1999	Sherri Spreadbury	270	65	Guy Gardner	
2000	Nick Saddah	290	70	Janice Voss	All volunteers assigned/trained for 1 activity
					Dry Run introduced to ensure all volunteers knew what to do on the day
					Agenda printed on the back of name badge
2001	Mitch Epstein	320	75	Loren Shriver	T shirt size and boxed lunch requirements asked for at the Call Out
					Due to drastic decrease in grants, did not provide T-shirts for students
					Due to a delay in securing astronaut decided to start invitation process much earler
					Assigned students to same Groups when they registered with friends and schools
					Registration boxes delivered to registration area the night before instead of the morning of PFSD
2002	Gina Pieri	350	80	John Casper	Separate SEDS and FSD volunteer call out
					Digital cameras used for first time
2003	Jen Watson	370	140	John Blaha	Increased number of Groups from 12 to 21 to accommodate higher numbers of students
					Ethnicity questions were asked on Registration form to identify underrepresented grps
					Debut of new web site - information, registration, photos, history, & student activities
					Online registration offered for first time
					Produced DVD of PFSD event
2004	George Pollock	390	150	Guy Gardner	Grades canged to: Grades 3-4, Grades 5-6, Grades 7-8
					Three age ranges increased the number of Activites from 6 to 9
					Ethnicity questions moved to the Evaluation sheet
					Introduced Mission Control as information booth for the day
					Mission Control Head included on Exec committee
2005	Erin Calderwood	410	158	Mark Brown	Introduced 2 FSD directors & 2 assistant directors
	Lindsay Gossom				Increased students to 400
					Used Lego Education kits
2006	Dorrie Byford	203	162	Greg Harbaugh	Increased students from 400 to 600
					Evaluations also carried out by the Purdue Education Department
					The Debris (Purdue Yearbook) covered PFSD event
					Generic Activity Book introduced for students instead of Group specific