

Mini-track: Making Waves in K-12 Perceptions of Computing

Session 3: Keep it Going! --The Evolution of Outreach Programs

Carnegie Mellon University (CMU) & University of Victoria (UVic)

1. Overview

Six universities are making waves across North America with the next generation of potential students. Pioneered by Carnegie Mellon Women @ SCS, we have created outreach programs that connect with young women and girls in high schools, middle schools and even elementary schools.

Our approaches are different, but we share a common goal — to communicate our enthusiasm for computing to youngsters who may never have thought of the opportunities the field holds for them. In a three-part series of workshops, we will share our ideas and experiences in an effort to inspire other schools to join our wave. We anticipate lively discussion on how-to topics such as: creating an outreach program that meets your unique needs; what goes into a great presentation; targeting females by breaking stereotypes; how to keep an outreach program going; train presenters; get funding; fine-tune it; and evaluate your success.

Outreach programs are an excellent way for women in computing today to affect future generations of computer scientists. By showing young students the diversity and excitement of computer science, we can change their perceptions of computing, erase harmful stereotypes, and make it an appealing career path for young women and minorities. Also, participating in an outreach program offers benefits to the presenters: practice at public speaking and an increased sense of confidence. However, maintaining a successful outreach program can require a tremendous amount of work. In this panel presentation, students from two universities that have ongoing outreach programs --University of Victoria and Carnegie Mellon University-- will offer specific pointers, tips, and tricks on how to sustain a successful outreach program efficiently.

The main objective of this session is to discuss how to sustain an outreach program. More specifically, the panel will address how to find continual funding, recruit new student presenters, find new places and opportunities to present, evaluate the impact and benefits, and use audience feedback to improve presentations. The workshop will require a 90 minute timeslot. The targeted audience for this panel presentation and discussion is educators and students interested in developing or maintaining an outreach program. Written materials will include information about the mini-track (including the times of the two other workshops), printouts of each school's presentation, tips for sustaining an outreach program, and a feedback form about the session.

2. Workshop Format

- Introduction of mini-track and session (10 minutes)
- Carnegie Mellon's *Roadshow* presentation overview: middle school, high school and college levels (10 minutes)
- The University of Victoria's *GogURL://* (pronounced Go Girl) presentation overview: high school (10 minutes)
- Panel Discussion (open discussion of topics described in Section 3) (45 minutes)
- Audience Questions (15 minutes)

3. Panel Discussion Topics

Here we briefly list essential topics for sustaining an outreach program that will be covered during this workshop.

Continual funding

Finding reliable and continual sources of funding is crucial for the success of outreach programs. Sources of funding may include the university/college, computing departments, Office of Women's Affairs, regional technology groups, professional advisory boards, national grants, local businesses, and technology industries (e.g., Intel, Google and Microsoft). Stakeholders must expect that success requires a long term commitment of ongoing support and that success builds year after year.

It's all about the people

The success of the outreach program depends on identifying a core set of volunteers who are willing to promote, implement, and coordinate the outreach effort, while keeping the doors open to new students who would like to participate. The best outreach presentations teams are often those with a good mix of experienced and new students, and this also constitutes a good and natural way to pass the torch. When an outreach program grows, it is crucial to have a paid coordinator to oversee outreach and retention efforts. We found that students who participate in outreach programs also become more motivated and develop a stronger sense of belonging to their academic program, which has a direct impact on retention. Therefore, we believe that outreach and retention go hand in hand.

Logistics and support

An outreach program needs both faculty champions and staff who are devoted to the outreach efforts. The program must be incorporated into the faculty/department culture and not be a stand-alone program. Senior administrators must go beyond simple financial support in order for the program to be successful. There is also a need for budgeting, bookkeeping and accounting, clerical help and scheduling. In an ideal situation, the administrative person is also devoted to the outreach program, since this allows other institutions to have a reliable contact person. This person could also be in charge of visits, travel, webpage, publicity, as well as the outreach presentations themselves.

Improve the presentation – tune it to feedback

Organizers should always look for ways to improve the presentation and keep it exciting by adding new material and most importantly by tuning the presentation to feedback from previous audiences, new presenters, volunteers, and faculty members. Organizers should also explore new fields and resources for the program. Our outreach presentations are constantly changing so as to adapt to the current team of presenters, their stories and their research interests and knowledge.

Build a supportive community

Building a sense of community is crucial because it creates a naturally supportive environment for the outreach program, computing departments, and local K-12 schools. Communities can help increase the volunteer base from both faculty and students, retain first year students, support current students, and make female students feel more comfortable in the computing departments. Mechanisms to create a community include: setting up events with speakers, group games, sponsoring events with food, and encourage faculty to attend and support events. Organizers and presenters should maintain a good relationship with the schools and keep in contact with them. Teachers at K-12 schools can support the outreach program by advertising through word-of-mouth to other community schools.

Evaluate your success

Quantitative and qualitative analysis of success and progress can be done through surveys, focus groups, comparison of graduation data, increased media coverage, identifying new university students who have attended outreach events. Presenters and organizers must consider how to get human subject committee approval from their university without burdening teachers, parents, and presenters. Feedback from students and teachers can help improve the presentation. Outreach organizers must find ways to articulate their success to administrators and sponsors.

Branch out

Although most universities are currently limiting their outreach programs to high schools, other groups to consider are middle schools, undergraduate students, summer camps, teacher tech, community outreach programs (creative tech nights for girls), special interest groups (school for the deaf), and science tech fairs.

4. Panel Members

Carnegie Mellon University

- **Ariadna Font Llitjós** is a 5th year Ph.D. Student in the Language Technologies Institute, School of Computer Science. She has been involved in outreach programs at the middle school, high school and college levels.
- **Emily Treat** is a 2nd year Masters Student in of Entertainment Technology at Entertainment Technology Center. She is the program Director of *Creative Technology Nights for Girls* and teaches weekly classes for middle school students.
- **Vinithra Varadharajan** is a 1st year Masters Student at the Robotics Institute, School of Computer Science. She has participated in *Roadshows* at the high-school level, including at the Western Pennsylvania School for the Deaf.

University of Victoria

- **Anissa Agah St.Pierre** is the Coordinator for Women in Computer Science and Engineering in the Faculty of Engineering. She has developed and implemented all aspects of this program since its birth.
- **Ruizhen Feng** is a Masters student in Computer Science. She has been involved in outreach efforts, in particular in Lego Mindstorms workshops.
- **Ulrike Stege** is an Assistant Professor in the Computer Science Department. She has been a strong pillar in various outreach programs both internationally and at the University of Victoria, and has been directly involved with outreach at the elementary school, middle school and high school levels.