Reaching Future Students with STEM Summer Camps

David Keathly, University of North Texas - Computer Science and Engineering
Principal Lecturer and Undergraduate Advisor
Elizabeth Halweg, Fox Valley Technical College - Instructor, Information Technology Department

Why do you want to host a summer camp? Your administration may ask for a justification.

* Benefits for participants – Aside from specific educational STEM objectives, campers develop valuable soft skills from working on team projects.
* Benefits to the school – Summer camps help boost the STEM enrollment of underserved populations by engaging students before they get to high school. High school is often too late to start steering students to STEM. Interested camper names go on your school’s mailing lists and hopefully they end up enrolling as college students. An additional benefit to the school comes from the positive institutional image this kind of program can provide. STEM camps create good PR, in other words, raising awareness of your school by providing an important educational service.
* Benefits to the community – Plenty of research points to the lack of STEM enrollment among underserved populations, especially women. These kinds of programs help remedy that inequity.

Planning your camp

* Research – If you’ve never done a camp before, talk to someone who has. They’ll be able to identify problems and best practices you won’t anticipate. For example, did you know boys love a competitive environment, while girls do not?
* Demographics
  o Age – What will be the age/grade limitations?
  o Gender – Consider a girls-only option for middle and high-school students. Introducing a single boy into an otherwise all-girl class can completely change the dynamic of the room.
  o Race – Grant funding may be available for targeted populations
* What will be the theme for your camp?
o Science sampler
  o Week-long project (design and build a robot, make a model race car, etc.)
  o Theme-based activities (computer science, biology, aerospace, etc.)
* Resources for ideas
  o PBS’ SciGirls: http://pbskids.org/scigirls/
  o PBS’ Design Squad: http://pbskids.org/designsquadsquad/
  o National Girls Collaborative Project: http://www.ngcproject.org/
  o NASA: http://www.nasa.gov/offices/education/programs/national/summer/education_resources/
  o Hobby store science kits

Funding your camp
* Expenses and costs
  o Printing/advertising
  o Staffing
  o Supplies
  o Hospitality/snacks
  o T-shirts/name tags
* Revenue/Resources
  o How much to charge participants - Youth camps range in price from free/low cost to several hundred dollars per week. Consider offering financial assistance to low-income families
  o Seek out industry partnerships - Don’t be afraid to ask. Sometimes you may get only a little at first, but as you develop that relationship you may get more assistance later. Don’t limit your search to just cash donations. Businesses can also donate supplies or provide help with volunteers.
    ▪ How do you pursue business partnerships?
      * Many businesses have school recruiters or a community outreach department you can contact for camp help.
      * Involve your school’s advising staff, the same people who connect your college with high schools can sometimes help refer you to possible business and industry sponsors.
      * Your school may also have a foundation that raises development money for scholarships. They already have relationships with businesses and may be willing to help.
* Tap your business council for help with referrals.

- Look for grant opportunities
- Ask for an investment from your school – You may need to sell the benefits to your administration, such as explaining how STEM camps can help meet important internal recruitment and educational goals.
- Don’t forget publicity – Spread the message far and wide and tout your camp. You especially want to publicize success stories to help legitimize your work. The more the community takes notice at what you’re doing, the better the chance is that sponsors will want to talk to you.

At a certain point, your camp may become self-sustaining and your fees pay for your expenses.

**Recruiting for your camp**

* Find staff/volunteers
  - Network to find resources from local businesses
  - Ask instructors from your institution
  - Partner with other schools or community organizations
  - Hire your college students

* Market and advertise your camp to prospective participants - You don’t need to attract students who are already into science. Your target is the “borderline” kids. You want the students not yet living up to their ability/potential so that a camp experience might properly motivate them.
  - Posters/flyers
    - Distribute to local schools (both public and private)
    - Post around campus
    - Local businesses/buildings that have bulletin boards (churches, chiropractic offices, grocery stores, YMCA, library, etc.)
  - Email
    - Past participants
    - Area high school and middle school counselors
    - Contacts from local youth organizations: Girl/Boy Scouts, Boys and Girls Clubs, homeschool networks, etc.
  - Website (e.g. [www.fvtc.edu/summercamps](http://www.fvtc.edu/summercamps))
  - Publications
    - Newspaper article
    - School course guide
    - School magazine
  - Other
- Radio stations
- Online community events calendars
- Community events (booth at science fairs, summer activities fair, etc.)
- Outdoor signs on campus
  - Word of mouth – this is often the most effective means of recruitment!

Tips for planning your camp’s format and structure

* The ten essential elements of a good summer camp
  1. Large but manageable group of campers (how large depends on the age of the group)
  2. Staff with good people skills – Spend a lot of time screening your current college students to hire as camp counselors.
  3. Clear theme (e.g. robotics) or target audience (e.g. girls)
  4. Good food – This is very important.
  5. Variety of classroom activities – Mix it up or else your campers will get bored; limit the lecturing.
  6. Provide unstructured “play time” – After campers learn the skill, allow them time to explore it.
  7. Projects and presentations – This builds those important social soft skills.
  8. Team activities – The buddy system spurs cooperation; no one feels stuck or lost because everyone has a partner.
  9. Entertainment – This can be a guest speaker or a screening of a movie.
  10. Something for the parents – Even if they’re not paying for it, build in a show-and-tell for family at the end of the week so the campers can demonstrate what they’ve learned.

* Selecting the dates
  - Check local school district calendar for dates of regular session and for summer school.
  - Research other community events/camps (what else might conflict?).

* Location/Setup
  - Make room reservations as needed.
  - Consider facility needs such as table space, A/V requirements, outlets, etc. (Facilities are often more available during the summer.)
  - Is there sufficient parking? Will staff need parking permits?
  - Consider a venue donation from business.
  - Go where your campers are, make it convenient for them to attend.
  - Typically, you’ll want two camp counselors and one faculty member present at all times at the camp.
* Curriculum
  o Get help from your college students. Let them help program the camp, then let them work as camp counselors to teach the content.
  o Strive for self-paced lessons so that the faster campers don’t have to wait for the slower campers before moving on. You want everyone moving at his/her own pace. Don’t let anyone get bored.
  o Give campers something to take home to show family and friends what they did in camp.
  o Plan for small groups of campers with few lectures and lots of energy.
* Food (if snacks are going to be provided)
  o Try to focus on healthier but kid-friendly options (e.g. muffins, string cheese, fresh fruit, chips and salsa)
  o Offer a variety of choices and be considerate of participants with food allergies or limitations. Many children in middle/high school have braces and aren’t supposed to eat excessively hard, crunchy, or sticky foods. Also, many schools and daycares now have no-peanut policies, since this is such a common allergen.
* Safety
  o Consider drop off/pick up procedures (i.e. require a grownup to accompany campers to/from the main meeting room each day). Call unexcused no-shows.
  o Have emergency contact numbers/special needs/allergy information readily available should staff need it.
  o Provide safety equipment as needed like safety glasses and gloves.
  o Require that campers wear appropriate clothing in lab/manufacturing environments (e.g. close-toed shoes, long hair tied back)
  o Make sure activities are age-appropriate
  o Give campers the same colored camp T-shirt so you can easily identify them. This can be especially helpful if you have more than one camp running at the same time.
* Evaluations
  o Give campers an entrance and exit survey. Did you learn anything? Did the camp change your mind about STEM?
  o Don’t forget to also consider surveying the parents. Did your child learn anything? Did the camp change your child’s mind about STEM?
  o Ideally, to gauge long-term impact, you’ll offer follow-up longitudinal surveys to campers every 6 or 12 months.
Encourage participation in surveys by explaining up front that demonstrating impact and progress is how the camp gets its funding. You need everyone’s help.

To view David and Elizabeth’s 52-minute lecture “Tips, Topics, and Techniques for STEM Summer Camps,” visit: https://www.youtube.com/watch?v=FlxmniUrzuo&list=UUm1L_81jN7AHvF3IxcsmazA