

Creating Community in Your Undergraduate Research Program: It Isn't Spontaneous!

Introduction

Creating a community among undergraduate researchers is an essential part of any undergraduate research program. We take this as a given. Helping all students feel comfortable in their research environment is important—especially students from under-represented groups and those who have come to the program from another institution. Creating community can be tricky, though. It doesn't happen spontaneously, particularly if the students work for different mentors or in different disciplines. Following are ideas that we have used to facilitate interaction and build community within our programs.

We represent both research universities and small private liberal-arts colleges. The University of Arizona (UA) in Tucson, Arizona, with almost 28,500 undergraduates, and the University of Missouri-Columbia (MU) in Columbia, Missouri, with nearly 23,000 undergraduates, are Doctoral/Research Extensive (Research I) and land-grant universities. A culture of undergraduate research permeates these institutions; faculty mentors and administrators strongly supporting undergraduate research. The College of Saint Benedict and Saint John's University (CSBSJU) are Catholic liberal-arts colleges founded by Benedictines in central Minnesota more than 150 years ago. The two colleges maintain a coordinated academic program for 3,800 undergraduate students, and the CSBSJU Undergraduate Research Program supports independent and collaborative scholarship in all disciplines. In spite of the differences among these institutions, our approaches to creating community are very similar. While most strategies described here take place during the summer, community development should be encouraged year-round.

Advantages of Building Community

Among the many reasons to build a community among undergraduate researchers is the evidence that students are more likely to persist in science if they feel a part of a supportive group with shared interests (Bender, *et al.*, 1994; Lopatto, 2004; Nagda, *et al.*, 1998; Seymour, *et al.*, 2004). Students positively value their interactions with peers as an important part of their experience. This seems to be a particularly significant factor for female students (Lopatto, 2004). Students who know

one another are more likely to converse with each other about their research, share ideas, and make connections among disciplines. Students who share their experiences with their peers also help reinforce the idea that there are different types of mentors and mentoring approaches. Use of a peer group as a resource and sounding board offers developmental advantages to students and may be especially important at institutions with few graduate students and post-doctoral fellows (Hunter, Laursen & Seymour, 2006). Building community stimulates the practice of networking, a vital skill.

Students who feel safe in a community of scholars are more likely to be comfortable talking to the program director about their progress or about problems in their work environment. By nipping problems in the bud, undergraduate-research program directors can influence students' success as researchers. From a practical standpoint, peers can alert the program director when a roommate or friend is ill or has personal or work problems that require follow-up.

Becoming part of a scholarly community creates a peer-driven culture of expectations. It offers students an opportunity to gauge their research progress against that of their peers, provides stimulation or motivation for students to "keep on task," and creates an encouraging and supportive atmosphere.

Participants in undergraduate research who identify strongly with the program may become future donors or program mentors at your own or another institution. Moreover, alumni will be more inclined to stay in contact with and provide information to a program about which they feel good and with which they identify.

Finally, building community can include activities that are simply fun, and fun is fun!

Basic Tenets for Community Building

Building a cohesive and interactive community of student researchers and their mentors—and building it anew with each cohort—requires the following:

- Students must get to know each other, personally and as fellow professionals.
- Mentors, students, and staff of undergraduate research programs must develop trust in each other.

- Communication should be easy, continuing, and take place in a variety of ways.
- Students must spend time with each other outside of the research venue.

Strategies for Creating Community

Group activities to build community can be structured around local programs or facilities. This makes students aware of campus resources that can help them as they pursue their projects and, over the long term, may influence their decisions about where to pursue post-baccalaureate education. For example, at the University of Arizona, students tour the artificial-heart lab, the mirror lab (where large telescope mirrors are made), and the core facilities at the Arizona Cancer Center. CSBSJU students take field trips to the Science Museum of Minnesota, Minneapolis Institute of Arts, and Hill Monastic Manuscript Library. At the University of Missouri, orientation activities and seminars take advantage of the facilities in the new interdisciplinary Life Sciences Center.

Community-building activities will vary depending on a sponsoring institution's size, type of undergraduate-research program, the disciplines represented, and budgetary constraints. We have found the following ideas suitable for our programs and encourage readers to use and adapt them as appropriate.

Activities to Acquaint Students with One Another

Our undergraduate-research programs all use some sort of kickoff event to mark the formal beginning of the program each summer or academic year. Orientation activities and safety training are especially important for those campuses that have undergraduate-research students coming from other institutions.

Stage information-acquisition hunts: Time spent on an ice-breaker activity can be very productive. We have used "information-acquisition hunts" (aka scavenger hunts) in which each student pairs with a student s/he does not know to find information about useful research resources. Examples include a library-database search and identification of congressional representatives responsible for science policy. Early finishers are given door prizes such as past issues of scientific journals, old lab coats, small pieces of outdated equipment or glassware



University of Missouri-Columbia 2007 interns pose for a group picture during orientation activities. Front Row (from left to right): Sarah Hargis, Northwest Missouri State University; Dana Hogg, North Carolina State University; Eun-Gyeong Jung, Gyeongsang National University, South Korea; Laura Engel, University of Missouri-Columbia. Row 2 (from left to right): Krystal Purnell, University of Missouri-Columbia; LeighAnn Jordan, Westminster College; Alison Oostendorp, Elmhurst College; Miles Walz-Salvador, University of Missouri-Columbia; Blair Meister, University of Missouri-Columbia; Parker Kessler, Northwest Missouri State University; Andy Halstead, Northwest Missouri State University.

and other castoff items. This activity can be done with any size group and tends to be both fun and useful for everyone.

Challenge courses, leadership initiatives, and group problem-solving challenges help to encourage bonding among students. Silly prizes also may be given to teams for "most spirit" and "best team name."

Program t-shirts help create a visual sense of belonging (and make for some striking photos to be used later for public relations!). We have found that program logos and photos from student activities also help to promote community identification.

Develop rosters of participants. It is important to stimulate students' interest in community building and to make it easy for them to contact one another. Program directors can develop a list of names and contact information for all program participants and distribute this the first day of the program. Useful information on the roster includes email addresses, home institution, dorm-room number (if living in the dorm), phone numbers, research (lab) location, source of funding (important when the student presents his/her work), and faculty mentor's name. Participants should, of course, be made aware in advance of distribution of the list so that they can opt out if they have privacy concerns.



University of Arizona REU students Alison Warren (Monmouth College), Ryan Golden (Mercer College), and Alicia Ortega (University of Arizona) harvest the fruit of the saguaro cactus in the desert outside of Tucson, Arizona.

Take advantage of logistical realities. Time spent in transit can be used to build community. We use bus trips from the airport to campus, to the grocery store, and on field trips to facilitate student interaction. Roommate assignments pair students from different research disciplines and geographic locations. Students with cars are paired with students without cars, resulting in impromptu social interactions and excursions, for example to Wal-Mart (for students from urban areas and other countries, a trip to Wal-Mart is an adventure).

Involve alumni in orientation or seminars. Program alumni can play a vital role in developing a spirit of community among undergraduate researchers. Alumni are always eager to be involved, and the information they impart to students can be very valuable. For example, they can help make students aware of different career paths and model the application of research skills to a wide range of fields.

Activities to Reinforce Community During the Research

Every time program participants are together, community development is fostered. Each of our programs makes use of local opportunities to reinforce the undergraduate-research community on our campus.

Field trips provide valuable supplements to the research experience. Faculty and staff with particular expertise may be used to lead such excursions. For example, hikes on Mt. Lemmon, an ecologically unique “sky island” in southern Arizona, are more interesting and informative when a fire ecologist from the dendrochronology laboratory provides narrative interpretation. Members of the Tohono O’odham tribe lead students in a saguaro fruit harvest in June, teaching students how indigenous people in southern Arizona harvested the desert in a sustainable way, as the students contribute to the harvesting effort.

Field trips can be directly related to the research the students do or they can provide interesting additions. Our students visit places such as Monsanto, the Missouri Botanical Garden, the Washington University Genome Sequencing Center, and the Danforth Plant Sciences Center, as well as a local granite quarry and the Minneapolis Mill City Museum. Think about your local area, and plan field trips that will both interest and inform your undergraduate-research students. State and national parks, museums, and other sites frequently will waive the admission fee for educational groups if arrangements are made in advance.

Pictures taken during field trips and other activities may be posted on the program’s Web site and on the program director’s office door to promote community. Photos can also be used in a slide show at the end of the program.

Educational seminars should offer both scientific talks by program mentors and other experts, as well as professional-development topics that help students build skills. Such topics can include elements of a scientific poster, how to give a scientific talk, how to apply to and select a graduate program, how to read a scientific paper, and how to keep a laboratory notebook. Other seminars and brown-bag lunches can be devoted to career exploration, research ethics, and policy issues. To encourage accountability, we expect students to attend these functions.

Small-group meetings, independent of lab meetings, are useful weekly or twice a month to spur undergraduate researchers’ professional development. If asked to make a brief presentation, students learn to present their research (and critique others’) in terms their peers can understand. In small programs, the program director might conduct these meetings. In larger ones, graduate students or postdoctoral fellows can be recruited as group leaders. It is useful to offer the group leaders a session of their own later to discuss their experiences in facilitating the small-group meetings.

“Homework” assignments for these small-group meetings enable students to plan ahead for what is expected. Sometimes the homework involves describing their own project and getting feedback; at other times students are assigned to visit another student’s laboratory or research site and report to the group about what she or he learned.

Regular lunchtime meetings provide additional opportunities for students to interact with one another, the mentors who choose to attend, and the program director. Brown-bag lunch groups that deliberately mix disciplines and mentors can provide excellent programming opportunities, giving students practice in sharing their research activities. In another model, if resources permit, lunch can be provided for a small group of students with a single faculty mentor. These meetings can also be done as a brown-bag lunch when resources are not plentiful.

Newsletters, either electronic or print, facilitate communication among faculty mentors, students, and program alumni. Articles, some written by students themselves, can feature students’ research, program activities, and other issues of interest. For examples of the University of Arizona’s newsletter, see <https://ubrp.arizona.edu/gazette/2007/05/default.html>. A newsletter can be an inexpensive and effective means of following students once they leave the program and of reminding them that they are still a part of a larger effort to support undergraduate research at their institution.

A program blog site can be used to post the newsletter and provide a platform for contributions, photos and links, and a program calendar. An example may be viewed at <http://missouriugrscholars.wordpress.com/>

Student advisory groups can be of great use in developing community. Students provide important sounding boards in determining what supplemental activities would have greatest appeal and can be of enormous help in promoting the program.

Social Activities

Organized social activities can usefully supplement undergraduate-research programs’ focus on scholarly work and professional training of student researchers. Tournaments and game nights (softball, bowling, volleyball, miniature golf, and card games) appeal to a broad spectrum of students and are

free or affordable. Talent shows have been a great success in our programs. If other campus groups or visitors attend (or participate!), such variety shows can serve as great publicity tools, as can such activities as marching in the local Fourth of July parade.

Concluding the Program and Following Up the Research Experience.

Having students present the results of experiments or creative activities is vital to bringing closure. Students need an opportunity to practice this at least once a year, and the event can become another community-building activity. Presentations can be done at the end of a summer program or, for year-round programs, at some point during the academic year. Some programs host a poster conference during homecoming to facilitate the inclusion of alumni. As the programs become increasingly established, an annual conference can take on the character of a reunion and help to promote the concept of community.

At CSBSJU, the president or provost often attends and extends congratulations at the poster conference that concludes the summer. This Celebrate Scholarship and Creativity Day showcases work done during the academic year. The University of Arizona holds two poster conferences—one at the end of the summer program for the visiting students and one in January at which UA students present their work. The University of Missouri also organizes two forums—one in the spring and one at the end of the summer. These events provide an opportunity to celebrate the students’ achievements and promote the program.

Community building should be considered a continuum, with a useful life well beyond the end of the undergraduate-research program. Thus it is important to develop strategies for retaining alumni in the community. We suggest:

Alumni listerv. It is relatively easy to develop and maintain an alumni listserv. An electronic newsletter, with an alumni column, can do a great deal to keep the program’s name alive in participants’ memories.

Invitations to participate. Alumni can be invited back to campus to speak to current undergraduate researchers about careers and as part of the annual poster conference. They are often eager to give back to the program in this way, and they can have a very powerful influence on their successors.

Conclusion

Community building can be fun and worthwhile for a myriad of reasons, and there are many ways it can be done. We encourage other program directors to build community in their programs and share their experiences of what works.

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