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CURFocus

Endowing Undergraduate Research to Ensure Growth and Stability

In 2015 it is safe to say that the value of engaging young college and university students in research is undisputed. Scores of articles and studies over the past 40 years support the consensus that connecting undergraduates to “real” research offers many major benefits, not the least of which are partnerships with faculty and other mentors, development of investigative and collaborative skills, and opportunities to explore different intellectual pathways. For decades, well-established research institutions such as the Massachusetts Institute of Technology (MIT) and the California Institute of Technology (Caltech) have regularly asserted that research can serve as an almost perfect complement to curricular work.

No date can be assigned to the first instance in which a member of the faculty invited an undergraduate to join a research project. However, the notion of institutions establishing “centralized” undergraduate research (UR) programs or offices is by and large a phenomenon of the 1960s and beyond. As the value of UR became more and more clear to an institution’s senior educators, so did the concept of campus-based structures devoted solely or in part to cultivating and sustaining research opportunities for undergraduates. Such enterprises provide resources and programming for students and their mentors, manage UR statistics for the institution, and, perhaps most importantly, build and manage the financial resources that support UR endeavors on campus. Two early examples of research institutions that not only recognized the value of formal, centralized UR programs but also the importance of strategies to include UR in fundraising efforts are MIT and Caltech.

As the imperative for offering opportunities for undergraduate research grows, so does the need for increased funding. Students, faculty, and colleges need to be more creative in their fundraising strategies. However, success just might be found in some tried and true strategies, such as raising an endowment. Endowments are created when a gift is given in perpetuity for a specific purpose. The principal of the gift is kept intact, while all or part of the investment income or “payout” can be used in accordance with the donation’s purpose. Endowments for undergraduate research provide an opportunity for both immediate growth and long-term stability.

This article will examine how MIT and Caltech have effectively used endowments to expand and support their programs for undergraduate research. While both are re-

search-intensive universities, the following strategies and lessons learned can be adapted across a diversity of institutional types.

The MIT UROP and Caltech SURF Programs

Founded in 1861, MIT is a private research university that maintains an intense focus on laboratory instruction within applied science and engineering disciplines. In 1957, Polaroid founder Edwin H. Land delivered a groundbreaking lecture at MIT titled “Generations of Greatness,” in which he expressed a belief that all people enter the world with the potential to achieve great things and, consequently, educators should always consider adopting the best and most progressive strategies for young people to maximize their intellectual potential. Land’s lecture posited that environments should be created in which students and faculty members work together on scholarly and research endeavors. Not surprisingly, this philosophy served, a dozen years later, as the key inspiration for MIT’s launch of the Undergraduate Research Opportunities Program (UROP).

Introduced in 1969 with a \$50,000 grant from Land and the limitless enthusiasm of a young junior faculty member, Margaret MacVicar, MIT’s UROP was remarkably free of parameters and restrictions. Students in any discipline at any stage of their academic careers could participate; participants were not confined to research within their own majors or restricted to science and engineering areas.

Today UROP requires that two criteria be met: A faculty member must endorse the student’s proposed research and offer supervision, and the work must have academic value. UROP is centrally administered in MIT’s Office of Undergraduate Advising and Academic Programming (UAAP). The office offers advising, programming, and services designed to support all undergraduates interested in research, and manages a budget that provides wages for undergraduate researchers. Approximately half of paid projects in UROP are supported through UAAP funds, and the balance through faculty members’ resources.

Students participate on a term-by-term basis; whether a project continues beyond one academic term or the summer is mutually decided between the student and the faculty mentor. Steps taken by each applicant include:

- Working with a faculty member or members to define a project.
- Completing an application that includes a one- or two-page research proposal, noting whether either academic credit or funding for compensation is desired.
- Submitting the application for review by the faculty member, host academic area, and finally, the UAAP.

Faculty mentors determine the student researcher's "deliverables," which might include a written report. As each term and summer concludes, the UAAP requests that student and faculty mentor each complete an online evaluation of the experience.

UROP was launched with about 25 students and soon gained traction. Today, 89 percent of MIT undergraduates participate prior to graduating, and more than half of faculty members are active as supervisors.

Similarly, the California Institute of Technology is a private university focused on research and education in science, engineering, and technology. Since its founding, Caltech has placed an emphasis on undergraduate research. In the early 1920s, Arthur Amos Noyes, a member of the institute's founding triumvirate, made the completion of nine units of independent research a graduation requirement for all chemistry majors. In 1928, Linus Pauling, an assistant professor of chemistry, and Caltech senior Edwin McMillan, both of whom would go on to win Nobel prizes, co-authored a paper in the *Journal of the American Chemical Society*. This serves as one of Caltech's earliest examples of the important outcomes that can arise from including undergraduates in the research enterprise!

Over the next 50 years, undergraduate research existed mainly in the life sciences and relied on federal grants for funding. However, in the mid-1970s, there was one year in which the National Science Foundation decided not to award grants to students while the agency revamped its growing undergraduate research program. This was of great concern for Caltech faculty members, who were upset that they wouldn't be able to work with students that year. Recalls professor Fred Shair: "At that moment, I wondered if Caltech might be ready to start its own formal summer undergraduate research program."

Indeed, in 1979, the institution's Summer Undergraduate Research Fellowships (SURF) program was established. SURF is a 10-week summer program designed to introduce students to research under the guidance of a seasoned research mentor. SURF began with two main goals: (1) make the fellowships available to students in all academic areas and

(2) raise an endowment to ensure consistent opportunities and growth. Today, Caltech's low student-faculty ratio of 3:1 provides an extraordinary opportunity for students to become involved with research on campus. At graduation, approximately 80 percent of students have done at least one SURF project.

SURF is administered by the Student-Faculty Programs (SFP) office, which provides support to students wishing to engage in UR. It also administers several other summer UR programs. SURF is modeled on the grant-seeking process and thus:

- Students collaborate with a potential mentor to define and develop a research project.
- Applicants write a research proposal as part of the application process.
- A faculty committee reviews applications and recommends awards.
- During the summer, SURF Fellows must submit two progress reports, write an abstract and final technical paper, and give an oral presentation at our campus-wide seminar day.

To further enrich the research experiences, a full calendar of seminars, workshops, and social and cultural activities are also provided throughout the summer.

Budgets and Funding

The question for most colleges and universities is no longer the importance or impact of undergraduate research, but rather how to secure adequate funding for it. Most programs need funding for staff salaries and materials and supplies. Some need funding for faculty stipends or to offset research-related costs. However, the biggest line item is that of student compensation. While some institutions offer UR for academic credit, it has become commonplace to offer stipends or pay to student researchers. This may be especially true for summer programs.

From the beginning, Caltech's SURF Fellows were paid to participate in the program. Faculty members were committed to the ideal that students should not need to choose between taking a paying summer job and participating in undergraduate research. The first SURF award was \$2,000 in 1979. Today, the fellows receive \$6,000 for the 10-week summer period. In general, student awards are funded half by faculty and half by the SURF program. It has long been suggested that it is important that faculty members contribute to the student awards. One faculty member has remarked, "It means we have 'teeth in the game,'" and therefore a stron-

ger commitment to the student. The funding that the SURF program provides for student awards comes mainly from an endowment, while Caltech's general budget and annual gifts provide funding for staff salaries and materials and supplies.

Caltech's SURF endowment was started in 1982 with an initial \$450,000 gift. Over the next 20 years, the endowment slowly grew to \$5 million. However, the program was still not meeting the overwhelming interest in the program shown by students and faculty members. In 1998, as part of the Western Association of Schools and Colleges (WASC) accreditation review, Caltech conducted a self-study of its undergraduate research structure that focused on the educational impact of the SURF program and identified the unmet needs. The faculty committee doing the self-study recommended, and the WASC visiting committee agreed, that "the endowment for the SURF program be substantially augmented" to meet the growing demand for undergraduate research and "to assign a high priority to fully endowing the program." Today the endowment is just over \$19 million, and the income generated accounts for over 30 percent of the annual budget for SURF awards (annual gifts and faculty grants provide the remaining funds).

At MIT, earning pay for UROP work was a viable option by 1973. The faculty's consensus was that earning payment in lieu of elective credit did not diminish the academic value of work done through UROP. Throughout the 1970s, though, most UROP work was conducted for academic credit; by 1983 the trend had changed significantly, with most students preferring to earn wages for UROP projects.

Today, the program's endowment stands at \$17 million, and the income generated accounts for close to 40 percent of the UAAP annual budget for UROP (the balance comes from unrestricted gifts and general institutional funds). Overall, MIT commits close to \$9 million annually to support UROP students, and about half of that comes from the faculty, reinforcing its strong commitment to undergraduate researchers.

Why an Endowment?

As noted above, budgets for undergraduate research come from a variety of sources, such as general budget funds, sponsored research, unrestricted gifts, and in some cases, endowment income. Colleges and universities have long understood the importance of having a strong endowment. Basically, endowments provide long-term stability. They are the "gift that keeps on giving." Other funding sources (grants, gifts, etc.) are not necessarily guaranteed from one year to the next. Endowment (and the income it generates) benefits the program for the long-term, if not perpetuity,

based on market behavior. Endowment-payout rates—the portion of the income that the institution draws from—differ from institution to institution, but they typically hover around five to five-and-a-half percent.

In 2002, on the heels of the accreditation recommendations, Caltech launched a capital campaign that included the goal of adding \$10 million to the SURF endowment. The foundation of the SURF campaign was providing donors an opportunity to establish individual named endowments. At the time, a named SURF endowment could be established for \$125,000. This amount was, in part, determined by considering how much payout would be needed to fund on annual SURF award. A generous donor provided a "matching" gift that provided 40 percent of the funds needed to establish an individual SURF endowment. This meant that those interested in establishing a new endowment could do so for 60 percent of the cost. This allowed many donors, who might not have had the ability to establish an endowment at full cost, the opportunity to establish a named endowment. This opportunity was especially well received by alumni and parents and resulted in nearly 50 new SURF endowments.

It is important to note that both Caltech and MIT had a long history of undergraduate research, as well as a strong relationship with students, alumni, and parents built over time. Before starting any fundraising campaign, building a solid program and a history of successful outcomes is as important as building strong relationships.

Relationship with Development

"But wait, I'm not a fundraiser..." We aren't either, nor should we be! It is important to understand that every college and university has a specific approach to fundraising and that development officers have expertise that is unlikely to be found in the staff of undergraduate research offices. We are not suggesting that this article is a comprehensive tutorial on endowment fundraising or that UR program directors should become fundraisers. The focus for UR directors should be on establishing and nurturing relationships with the campus development staff to determine if and how an endowment for UR fits into the overall fundraising plan of the campus.

The most important point here is to establish and cultivate a relationship with your campus's development team. Development officers should be able to tell your story as well as you can. This means that UR directors need to spend time meeting with development officers and making sure that they understand the program and its impact. Alternatively, UR directors need to learn about the fundraising strategy

and goals of the institution and figure out how they can best support those efforts.

One way that UR programs can help development officers is by making sure that they have materials to share with potential donors. At Caltech, this has been critical. Development officers are often looking for professionally designed materials that they can take with them on donor visits. A few years ago when we were faced with budget cuts, we made the decision not to go with an online-only version of our annual report. We felt, and continue to feel, that the glossy annual report is important to our fundraising efforts.

Similarly, MIT works to ensure that development personnel have the materials and information necessary to have meaningful and hopefully fruitful conversations with prospects, including compelling student stories. The materials also mention an annual budget shortfall, further emphasizing financial need. Serving as the central administrative unit for MIT's UROP, the Office of Undergraduate Advising and Academic Programming (UAAP) also provides more detailed "talking points" for the development staff. The document offers program data points and historical context that might prove useful in soliciting donors, as well as suggesting giving "levels."

Stewardship (and How We Steward) Is Critical

In many ways, stewardship is "telling a story." It's giving donors some detail on how their support benefits specific students, how it might impact scientific discovery, and how it makes a "difference." Documenting how donors' support impacts students also benefits fundraisers, who can subsequently share student "stories" with prospective donors. There are a number of approaches that a program can take.

MIT's approach to donor stewardship is multi-faceted and involves numerous "players." Essential for UROP stewardship are staff members in the UAAP, who each year generate more than 60 comprehensive annual reports for key donors to UROP. Each report expresses gratitude for continued support, along with a list of the students supported in the past year. In addition to information on each student supported, descriptive detail on the student's research is provided.

MIT's UROP students are also encouraged to participate in the stewardship of donors. Each year, approximately 400 students receive support from named UROP funds, and each award notification provides the student with background on the donor or the individual(s) for whom the fund is named. Perhaps most importantly, recipients are prompted to send a thank you message to the donor(s) who are sponsoring their research.

On a case-by-case basis, the UAAP is prepared to directly connect student recipients with the donors behind specific named UROP funds. Such instances could take place over an informal meeting, a lunch, or a more formal student presentation. A particularly successful approach in this vein is MIT's annual Scholarship and UROP Brunch, which brings together scores of key donors of scholarships and UROP funds. Student awardees meet the donors who have provided their support, and the donors have the opportunity to hear first-hand how their support impacts students. The brunch also features a panel of student scholarship and UROP recipients. Facilitated by MIT's chancellor, each panelist talks at some length and with some eloquence on the positive impacts of donor-supported learning experiences, followed by a Q&A. Overall, the brunch has been very effective in directly conveying the student "story" to an audience well-positioned to provide critical support.

Caltech's stewardship plan begins with a concept called "soaking the beans." This phrase started with an alumnus and good friend to SURF. As he explains it, every delicious pot of chili starts with soaking the beans. Chili-making cannot be rushed, it takes time. In other words, relationships are at the root of every gift and must be nurtured over time. Furthermore, all stewardship should be designed to strengthen and build the relationship. Soaking the beans has become a mantra in our office. We think of every interaction—with students, alumni, parents, faculty—as a chance to begin or nurture a relationship.

It is also important to make sure that donors understand just how important their investment is. This starts with thank you letters from both the institute and the program. Every donor also receives a hand-written thank you note from a SURF student. Our office sponsors a Donor Appreciation event at which we provide students with information about the donor, a "tutorial" on how to write a strong thank you letter, and stationery to do so. And finally, donors are recognized in an annual report that is widely distributed.

Caltech's stewardship plan also includes several opportunities for donors and students to connect each year. Every donor is invited to three main annual events: the SURF Kickoff Dinner, the Student-Donor Dinner, and Seminar Day. Each event allows donors to meet and interact with the students they support. They can hear directly from students about their research and the impact it is having (or has had) on their academic experience.

Key Lessons Learned

As program directors, we've learned a lot about fundraising and the important impact that endowments can have on a program. But, most importantly, we've learned about our role in the fundraising process. Here are some of those lessons:

- Cultivate your undergraduate-research story and tell it over and over again.
- Focus on “friend-raising” and building long-term relationships with students, alumni, and parents.
- Use accreditation, self-studies, or other campus assessments to your advantage. These are ways to share the impact that UR is having on your students.
- Cultivate strong connections with campus development and alumni-relations offices. Engage everyone you can to be part of the excitement.
- Create visually appealing materials. As program directors, we often spend our limited time and resources on developing websites and materials aimed at engaging our students. While this is critical, any spare resources you may have should be used to create materials that can be shared with alumni, parents, and donors.
- Develop a comprehensive stewardship plan that is focused on bringing donors, students, and faculty together to highlight the importance of UR. Donors who support UR are often motivated by the impact that they can have on the individual student, so it is important to provide them opportunities to hear directly from such students.

Conclusion

While many directors of UR programs are turning to new and innovative ways to fund UR, such as crowdfunding, we believe tapping into the tried and true power of endowments is another way in which we can plan for the long-term success and stability of our programs. While most of us are not fundraisers and do not have the resources to launch big fundraising efforts on our own, there are a lot of things that as program directors we can do to help our campus development team. Based on our experience, here's a roadmap to help you begin thinking about fundraising:

- What is your UR story? Develop it. Refine it. Tell it repeatedly.
- How do you share it—inside and outside of the campus?
- What support do you need to create and share your story?
- How are you friend-raising?
- What's one new thing you can do to create relationships with potential donors that doesn't involve asking for money?
- Are there campus assessment efforts, self-studies, or accreditation visits that you can participate in?
- Who are your campus, alumni, and donor allies? Where are the gaps?
- How do you provide stewardship of your donors? What else can you do?
- What, and where, are the roadblocks to raising money for UR? 

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