

# Summer Undergraduate Research Experience: A Model for Student Participation in a Competitive Grants Program at the University of San Diego

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Psychology faculty have recognized the importance of research skills to a strong undergraduate curriculum (McGovern, Furumoto, Halpern, Kimble, & McKeachie, 1991), and various writers (Landrum & Davis, 2004; Purdy, Reinehr, & Swartz, 1989) have noted the role of research experience as preparation for graduate education. Further, psychology teachers see research as a useful teaching tool (Chapdelaine & Chapman, 1999).

Involvement of undergraduates in research has shown some increase in recent years (Kierniesky, 2005), despite the fact that many students undertake studies in psychology without a recognition of the significance of methodological skills to their professional development (Bailey, 2002). Most teachers of science would agree that we must be effective in teaching research methods (e.g., Ware & Brewer, 1999), and that students learn research skills best via active engagement (McGovern et al., 1991)—by actually *doing* science and collecting data through “real” research.

If students are to participate in a meaningful way in conducting scientific investigation, they can benefit greatly from collaboration with faculty mentors. Davis (2007) articulated numerous benefits associated with such collaboration, for both students and faculty. However, students and faculty may lack necessary resources to devote significant time and effort to research projects, particularly during summer breaks when students may find it necessary to earn income to support their education. In recognition of these challenges, in the year 2000, we established the University of San Diego Summer Undergraduate Research Experience (SURE) program, with the cooperation of six departments (biology, chemistry, marine and environmental studies, mathematics and computer science, physics, and psychology).

## **University of San Diego**

The University of San Diego (USD) is a private university, enrolling approximately 7,500 students in

the College of Arts and Sciences and five schools (Law, Leadership & Education Sciences, Nursing, Business, and Peace and Justice). USD is classified as a national research university, although the College of Arts and Sciences, with about 4,000 students, and housing the psychology department, is a traditional undergraduate liberal arts program. The department has 12 full-time faculty and several adjuncts, with approximately 300 undergraduate majors and no graduate programs.

The psychology department has a long history of fostering undergraduate research and offers a typical empirically-oriented curriculum. The culminating experience for students in the psychology major is completion of an upper-division research laboratory in 1 of 9 topic areas (animal behavior, biopsychology, clinical, cognitive, cross-cultural, developmental, health psychology, learning and behavior, social). The labs aim to foster library research skills, student development of research topics, and preparation of APA-style research reports (Keith, Meerdink, & Molitor, 2007).

## **Nature of the SURE Program**

The SURE program is a competitive summer research grant project open to returning students (i.e., not seniors). The coordinating faculty circulate a call for proposals each year in November, with proposals due in February. In consultation with a faculty mentor, student investigators (singly or in pairs or small groups) develop a research idea, prepare a short proposal and budget, and submit their proposals to the SURE committee. A six-member faculty team (one from each core department) evaluates the scientific merit and clarity of the proposals and makes decisions about funding. The SURE coordinators generally make funding announcements prior to spring break, so that students have sufficient lead time to make their summer plans.

SURE funds are provided by the Office of the Dean of the College of Arts and Sciences, and the

Office of the Provost, as well as from external grants that include funding for student researchers. The funding base for 2007 was \$118,000. The program guidelines provide for maximum summer stipends of \$3,000 per student and \$3,000 per faculty member (\$4,000 for multiple students) for full-summer projects with proportional stipends available for briefer studies. The review committee may also provide somewhat reduced faculty stipends in an effort to fund more projects if such reduction does not substantially alter or jeopardize a particular proposal. The program also provides on-campus housing allowances and funds for research supplies. As a condition for participation, student researchers must agree to present a summary of their work in a SURE-sponsored poster session in the fall semester following their summer experience and in a university-wide research conference the following spring.

## **Student and Faculty Participation**

### ***Departmental participation***

The mean annual number of applications submitted to the SURE program since its inception is 32. Of these, the program has provided funding for an average of 25 projects each year, producing a funding level of 78%. In recent years, SURE has expanded somewhat, with a small number of applications coming from departments of engineering, communications studies, and health sciences. Thus, over the life of the program, applications have been submitted by students from biology (30%), chemistry (20%), psychology (19%), math/computer science (14%), marine science (7%), and physics (5%), with smaller proportions from the remaining departments.

### ***Student outcomes and evaluations***

SURE-funded projects have led to student authorship of many conference manuscripts and professional publications. In psychology, at least one project resulted in a national student research prize (American Psychometric Society), and two have won the Psi Chi award for best research poster at the Western Psychological Association convention. When evaluating their experience in the SURE program during a recent year, students using a scale from 1 (*Poor*) to 5 (*Excellent*) gave the overall experience a mean rating of 4.53, and the quality of the research experience in particular an average of 4.65. On a scale from 1 (*Definitely Not*) to 5 (*Definitely*), they produced a mean rating of 4.29 when asked if their results were interesting or

valuable, and a mean of 4.71 when asked if they would participate in SURE again or recommend it to a friend.

### ***Administrative Issues***

A program such as SURE does not spontaneously emerge in a university environment in which funds are at a premium, faculty are already working hard, and students do not recognize the importance of research experience. And SURE probably would not exist if several departments had not come together to present a cooperative, coordinated front in approaching university administrators for funding and the kind of symbolic support that advocate research as an important, visible activity.

The core SURE departments had a long history of encouraging undergraduate research. However, in coming together in a sustained and coordinated effort, they were able to develop a program that no one department could have achieved by working alone. Currently, a faculty member from psychology and one from biology serve as coordinators of the SURE program, and they and their colleagues must continue to advocate each year for ongoing funding and support. Although some projects perhaps do not merit funding, it is essential that the program maintain sufficient funding to support those that do; there would be little advantage to maintaining a program that might discourage students whom faculty are trying to encourage.

### **Summary Thoughts**

Students give SURE high marks; the program meets their expectations for a quality research experience, and a large majority of students would participate in SURE again. Student researchers gain confidence that they can produce interesting results, present their results in scientific venues, and even publish their results in scientific journals. Many students have been successful on all counts. The competitive grant structure has also taught student participants something about the real world of research—the reality that justifying funding and accepting critical review are both a part of the process. In addition, the multidisciplinary nature of SURE may help students to develop an appreciation for the relationships among various branches of science.

Finally, the program has succeeded in producing the kind of student-faculty collaboration that Davis (2007) discussed and the opportunity for students to experience in scientific activity the kind of satisfying,

engaging process that Keith, Meerdink, and Molitor (2007) advocated. As a result, these student researchers have taken a step toward the kind of ability, persistence, and experience that will serve them well as they move to graduate education or professional work in which the skills of critical thought and analysis are essential.

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