

Undergraduate Student Research Journals: Opportunities to Publish and Learn

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Undergraduate student research journals serve many functions in addition to publication of original research. They provide a forum for training, and they showcase undergraduate research to other institutions and to prospective applicants. Students whose papers are chosen for publication build up their curricula vitae and learn about the benefits and challenges of publishing research. Students who serve on editorial staffs gain editorial and leadership experience. They learn fundraising techniques, participate in peer review and revision, and come to know the importance of deadlines and timelines.

Experience with undergraduate journals encourages many student-editors to enter careers in research or editing. Says Dawn Zhang, a co-editor-in-chief of the *MIT Undergraduate Research Journal (MURJ)*: “the ability to contribute to scientific discussion and a marketplace of ideas through *MURJ* has been an extraordinarily rewarding experience.”

Most student research journals are produced by individual universities and publish scientific papers in multiple disciplines. Others focus on a specific discipline, showcase the efforts of a particular program, or are devoted to the advancement of undergraduate research regardless of the institution of origin. Although the journals are student-run, many have faculty advisers whose responsibilities include making sure fundraising efforts have covered publication costs, keeping the editors and authors on track for publication, and helping to find peer reviewers.

For the most part, readers of the journals are undergraduate students, science faculty,

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university alumni and donors, and potential students. Journals are usually found around campus or in local bookstores, in department offices, and online. They are advertised in student e-mail messages, on posters around campus, in freshman recruitment packages, and in alumni publications.

Departments whose students might participate are often given copies of the journal to encourage students to join the staff or contribute their research. Professors are also encouraged to recruit qualified students to submit papers. Calls for authors and papers are often made through e-mail messages to undergraduate science majors and to science faculty who might recruit their student researchers.

Most of the journals have editorial processes similar to those of regular scientific journals. Staff typically work on a volunteer basis. Activities include fundraising, peer review, manuscript selection, and author correspondence. Some journals also have staff writers.

This article presents examples of undergraduate student research journals and offers glimpses of their functioning. Links to the Web sites of more than 40 undergraduate journals have been posted at www.cwr.org/ugjournal.html by the Council on Undergraduate Research, a not-for-profit educational organization that “focuses on providing undergraduate research opportunities for faculty and students”.

University Journals

Examples of individual universities' student research journals are *MURJ*, the *University of Texas at Austin Undergraduate Research Journal (UT Austin URJ)*, the *UCLA Undergraduate Science Journal (UCLA USJ)*, *Berkeley Scientific*, and the *Berkeley Undergraduate Journal (BUJ)*.

MURJ is a completely student-run interdisciplinary science journal. Published twice a year, it has a colorful, eye-catching

cover. It includes a Massachusetts Institute of Technology (MIT) science news section, a world science news section, features, “UROP” summaries (summaries from the undergraduate research opportunity program), and full-length reports. It is one of few student journals with advertisements, which are a major source of revenue for the journal. Its remaining funding comes from the MIT Undergraduate Association.

MURJ finds its authors mainly through faculty research-adviser referrals and undergraduate readership. The editorial staff decide on a theme for each issue, such as energy or neuroscience, and try to publish related features and news stories, which they or other undergraduates write, and manuscripts on similar topics. Cover art is related to the issue's theme; it may be submitted by either a member of the editorial staff or another student. All manuscripts appearing in *MURJ* have undergone peer review, and all published items have undergone two rounds of editing. With regard to attracting authors, Zhang says, “we feel the ability to highlight one's own thoughts, ideas, and research is the greatest incentive for authors to publish.”

Some student journals offer additional incentives, such as cash prizes. The *UT Austin URJ* is one such journal. It recruits authors from all fields of scientific study through academically oriented organizations on campus. Those whose papers are accepted receive a small cash award, and a \$200 prize is offered for the article voted best by the editorial committee.

“I am always impressed by the articles we receive; the authors put in a lot of effort to showcase their best work, and it is exciting to see that research is such an important part of their academic career,” says Editor-in-Chief Aisha Ellahi, a senior earning a degree in both cell and molecular biology and participating in a liberal-arts honors program. “It is a truly exceptional chance for students to guide, shape, and

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be an integral part of their own academic research community.”

Papers submitted to the journal undergo two major rounds of review. The first is a peer review, in which about half the submissions are selected by undergraduates and graduate students specializing in particular fields to go before a faculty review board. Papers are then reviewed by faculty in appropriate specialties in one of the few steps involving faculty. Detailed written critiques from the faculty aid in choosing five to eight articles for publication. After the authors use the critiques for structural and technical revision, papers are given to student-editors for polishing, proofreading, and publication.

“I find working with the *URJ* immensely rewarding,” says Ellahi. As a student who plans to attend graduate school and dreams of conducting her own research, Ellahi values the opportunity to learn about the submission process, peer review, and other aspects of editing and publishing a journal.

Although print is still the preferred method of publication by both the editors and readers, the *URJ* has recently gone online in an effort to expand readership and appeal. “Ideally, we would like to reach all undergraduates, even those not currently doing research, and get them interested in and compelled to do their own research,” Ellahi says. She says that once students see that undergraduates are a prominent research force on campus, more will be persuaded to enter research.

At the *UCLA USJ*, one of the biggest challenges “is getting the students to understand peer review”, according to Tama Hasson, an adviser to the journal and assistant director of the University of California, Los Angeles (UCLA) Undergraduate Research Center. Before 2007, graduate students reviewed the articles, but Hasson says that she wanted to get the undergraduates more involved in this process. “I gave [the staff] a seminar on the ins and outs of the process and the ethical components of peer review. And, to their credit, they did a great job!” The *UCLA USJ* offers cash in the form of “dean’s

prizes” in review, interview, life-science research, and physical-science research. Despite the name, the student editorial board chooses the winners.

The University of California, Berkeley (UC Berkeley) has two undergraduate research journals: *Berkeley Scientific* and the *BUJ*. The former, which spans various scientific disciplines, has won prizes from the Columbia Scholastic Press Association. It has a faculty adviser who is responsible for keeping editorial processes at the journal moving and for instructing students on editorial and writing techniques and on the peer-review process used by the journal.

The *BUJ* is a social-sciences and humanities publication that began in 1988. It publishes essays and research papers by undergraduate students and profiles the contributors. Jennifer Kim, editor-in-chief, is responsible for setting the publishing and editing timetables each semester and for keeping her editors and authors on track. She also works with the managing editor to direct fundraising efforts, which usually involve soliciting campus organizations for advertisements and donations. The journal offers a cash incentive similar to UT Austin’s to encourage submissions.

Because of turnover as students graduate, the momentum of an undergraduate research journal can be difficult to maintain. Thus, some such university journals vary in quality and activity over the years, and some do not survive long. Single-discipline undergraduate journals, commonly led by faculty members and obtaining submissions from various universities, may be suited for greater longevity.

Single-Discipline Journals

Some undergraduate journals focus on research in a particular scientific field. They may be published by universities or scientific societies, but they usually accept submissions from students at any university. Editors of these journals tend to be faculty, not students; most volunteer their time.

In 1930, Beta Beta Beta (Tri-Beta), a US national undergraduate honor society in biology, began the journal *BIOS: A Quarterly Journal of Biology*. The journal

publishes student research, society news, and articles of biologic interest. Perhaps the only such journal of undergraduate biology research, it is included in library collections worldwide. More than 8500 subscribers, mostly college biology majors and faculty, receive *BIOS*.

BIOS Editor Lori Kelman, professor of biotechnology and chair of the Natural Sciences Department at Montgomery College in Germantown, Maryland, is responsible for all editorial and managerial duties for the journal. When she took the position in 1998, Kelman promoted the journal heavily in Tri-Beta chapters. Whereas there were few submissions before the promotional effort, *BIOS* now receives enough unsolicited submissions to fill every issue. The editor selects all articles to be published in *BIOS*, using the criterion that they are “of interest to undergraduates or faculty in biology”, Kelman says. They undergo peer review, as well as editing by the one copyeditor employed by the journal.

The Virginia Military Institute (VMI) *Journal of Undergraduate Chemical Research* was founded by Chemistry Professor Daniel Y Pharr, who remains the editor doing most of the work for the journal. Funded by the VMI Department of Chemistry and subscriptions, the journal aims to encourage student research involvement and broaden dissemination of student research. It is distributed to chemistry departments at universities across the country.

Another journal dedicated to a specific field is the *Rose-Hulman Institute of Technology Undergraduate Math Journal*, published by the Mathematics Department at Rose-Hulman Institute of Technology (RHIT) in Terre Haute, Indiana. The journal accepts only papers for which all authors are students. Having advertised in mathematics journals, mathematics departments, and conferences for its first few years of operation, the journal has no difficulty in filling issues. RHIT provides space for a Web site, and the Mathematics Department paid for a professional to create the Web site.

Editor Roger Lautzenheiser, a faculty member at RHIT, says that the biggest difficulty he encounters while producing the journal is in finding people to review articles. Lautzenheiser and Tram Hoang, a student author, published in the November 2005 issue of *Math Horizons* an article discussing publication of an undergraduate mathematics paper from their two perspectives.

Among other journals focusing on undergraduate research in a specific field are the *Canadian Undergraduate Journal of Cognitive Science*, published by students at Simon Fraser University, and the *Undergraduate Journal of Psychology*, published by the Department of Psychology, University of North Carolina at Charlotte.

Other Journals

The US Department of Energy (DOE) publishes an annual journal, the *Journal of Undergraduate Research*, featuring research by participants in the DOE Science Undergraduate Laboratory Internship Program. All DOE laboratories with students participating in this program are listed in the front of the journal. Indexes by name and by university allow easy navigation through this roughly 300-page full-color journal.

As part of the program, students must submit abstracts of their work to the *Journal of Undergraduate Research*. Nearly all the abstracts (about 650 per year) appear in the journal, which is used to advertise the internship program. The journal is sent to libraries of universities with students in the program and to Congress. Students who write the best abstracts are nominated to write full-length papers, which undergo a rigorous review and revision process.

The peer-review process uses research scientists at participating universities and laboratories. The students make corrections based on the reviewers' suggestions, as well as grammatical and structural changes, and are heavily involved in the editorial process. Jeffery Dilks, a high-school physics teacher on an Einstein fellowship with DOE who is editor-in-chief of the journal, says that a main purpose of producing this

journal is to give students the learning experience of editing and publishing their work, inasmuch as most of the students have decided to remain in research. Occasionally, papers are republished in expanded form when students continue their research in more depth.

The *Journal of Young Investigators* (JYI), an entirely online publication, is one of the best-known undergraduate research journals. An international journal with staff throughout the world, it accepts submissions from any undergraduate student in any scientific discipline, and it has a complex editorial structure. Founded in 1997 and funded by the National Science Foundation, the Burroughs Wellcome Fund, and other supporters, JYI is essentially run by undergraduates for undergraduates.

All JYI staff members are undergraduates or others who graduated less than a year earlier. The editorial staff has an editor-in-chief, a managing editor, senior features and research editors, copyeditors, news editors, more than 50 associate editors, and more—in addition to the chief executive officer, the development and technical officers, the public-relations director, and an advisory board. Staff members represent more than 60 educational institutions on three continents, and all are volunteers. In its mission statement, JYI puts forth its belief that if undergraduates are to become successful members of the scientific community, they must be fully prepared as communicators of science to both the scientific community and the public.



Journal of Young Investigators Chief Executive Officer Heather Mispagel, Senior Features Editor Pooja Ghatalia, and Research Editor Alexander N Patananan.

The Editors

The student-editors who run these journals gain valuable experience. Their career goals are often influenced as they learn about science editing and publishing.

"I saw a great opportunity in the URJ to learn and be a central part of the research community at UT," Ellahi says. "Working at the URJ has certainly influenced my career goals in that I am now open to the possibility of working with a science journal in the future." Kim, at UC Berkeley, says that she is "much more familiar with the business aspect of publishing" and is now considering jobs in this realm.

For Kim, the greatest satisfaction has been working with individual authors to understand their goals in publishing their papers and helping to reach those goals through editing and revision. "That's the best part of being an editor—the communication is so key to polishing the argument and extracting a solid paper from the unedited draft." The experience has shown her the power of editing. 🌟