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Sharon A. Weiner, Charles Watkinson

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PRACTICE

What do Students Learn from Participation in an Undergraduate Research Journal? Results of an Assessment

Sharon A. Weiner *Professor and W. Wayne Booker Chair in Information Literacy, Purdue University Libraries*

Charles Watkinson *Director, Purdue University Press and Head, Scholarly Publishing Services, Purdue University Libraries*

Abstract

INTRODUCTION Undergraduate research journals provide students with an opportunity to disseminate their work while learning about the scholarly publishing process. The opportunities to learn about scholarly communication have been demonstrated, but such journals also offer a means of helping students attain necessary information literacy competencies. By partnering in the publication of undergraduate journals, libraries can further strategic goals related to information literacy and establish a connection between library publishing and student success. This paper reports on an assessment of the *Journal of Purdue Undergraduate Research* (JPUR) that was designed to evaluate student learning outcomes and demonstrate connections between journal participation and student success. **METHODS** The assessment plan included all student and faculty stakeholder groups. Online surveys were distributed to primary stakeholder groups annually for three years; students who attended workshops were asked to complete evaluations; and web metrics were collected. **RESULTS** The findings indicated that students experienced gains in learning as a result of writing an article, writing a research snapshot, or mentoring a student author. Because of their involvement with JPUR, student authors intended to publish articles in the future. JPUR influenced career decisions. Faculty were motivated to continue to act as mentors for undergraduate research. **DISCUSSION & CONCLUSION** The assessment showed that student authors benefitted from experiencing the full spectrum of the scholarly publishing process. Notably, students gained knowledge of important information literacy concepts. These learning gains and the demonstrated influence of JPUR on student career and scholarly aspirations clearly show that publication of an undergraduate research journal supports university priorities for student success as well as the Libraries' strategic priorities of information literacy and scholarly communication. It is recommended that other institutions that are publishing undergraduate journals undertake similar assessments, which will further establish the value of such publications.

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INTRODUCTION

There is an increasing focus in colleges and universities on the quality of undergraduate education and its role in preparing students for the workplace and graduate study. Learning through direct experience with research projects is one recognized means for undergraduate students to develop the skills necessary to succeed after graduation. Indeed, the seminal report of the Boyer Commission on Educating Undergraduates in the Research University (Boyer, 1998) acknowledges this through its recommendation to "make research-based learning the standard" for undergraduate education. The Commission advocates for students to participate in and learn through research and primary source materials beginning in their first year of college. These research experiences can help students to develop "the abilities to identify, analyze, and resolve problems [that] will prove invaluable in professional life and in citizenship" (Boyer, 1998).

While some students involved in undergraduate research have opportunities to co-author articles with faculty mentors, they may not have the opportunity to take a leadership role in preparing a publication or to experience the publication process from start to finish. It is also often unclear to readers what the specific contribution of the undergraduate was to the paper, especially in science and engineering subjects where large numbers of authors may be listed. Undergraduate research journals fill that gap. They provide students with the opportunity to author articles about their research projects and to experience the spectrum of the process from submitting a paper proposal to checking proofs. The student authors also get full credit for their work and can use offprints in applications for graduate school or employment.

For universities that want to establish undergraduate research journals, the library is a logical publishing partner. Librarians can share expertise in scholarly communication issues with students and faculty as well as provide instruction on information literacy skills critical to the preparation of articles. Furthermore, many libraries have established infrastructure, services, or partnerships in support of publishing activities. In 2011 an estimated 55% of academic libraries of all sizes were either developing or implementing publishing services (including 79% of the largest, ARL, research libraries) (Mullins et al., 2011).

At Purdue University, scholarly communication and information literacy are strategic priorities for the Purdue Libraries, the Purdue University Press is a unit of the Libraries, and the Director of the Press is also the head of scholarly publishing services for the Libraries. Together, this organizational alignment and the strategic priorities of the Libraries provided an ideal collaborative setting for the founding of the *Journal of Purdue Undergraduate Research* (JPUR). The Office of the Provost initially funded the journal for three years, with further funding dependent on the journal's ability to demonstrate a connection between student participation in the journal and student success. In order to evaluate any such relationship and provide data for future funding decisions, the journal's Advisory Board developed a comprehensive assessment plan. The fact that the Office of the Provost recently funded the journal for a fourth year indicates that the journal has had a positive impact on student success—and that the assessment methods described in this paper were able to establish a connection between student success and participation in the journal.

LITERATURE REVIEW

The literature clearly demonstrates that undergraduate students benefit from engaging in research experiences. Studies indicate that student participation in research had a positive influence on their persistence and degree completion (Pascarella & Terenzini, 2005). Students experienced gains in career aspirations; professional identity; confidence with and understanding of their subjects; knowledge of the research process; dissemination of research orally and in writing; teamwork and working independently; understanding of scholarly literature; and computer and statistical skills (Fechheimer, Webber, & Kleimer, 2011; Sadler & McKinney, 2010; Thiry & Laursen, 2011).

Writing and publishing study results is an integral part of the research process, often lacking in undergraduate research (Walkington, 2012). The undergraduate research journal is a relatively new means for this scholarship dissemination. In 2008, there were around forty such journals published in the United States (Reno, 2009) and there were 115 in 2013 (CUR, 2013). But the literature on undergraduate research journals is sparse. Although there has been some controversy about this type of publication with some faculty preferring that students publish as their co-authors in

disciplinary journals (Gilbert, 2004; Ho, 2011; Jungck, Harris, Mercuri, & Tusin, 2004; Siegel, 2004), some authors acknowledged the benefit of such journals, for example, as a symbol of an institution's commitment to undergraduate education (Morris, Zheng, Kulp, Bokre, & Santiago-Aviles, 2006; Reno, 2009). Students surveyed at the University of Plymouth thought that an undergraduate research journal "fostered a greater understanding of the research process and…could stimulate additional critical discussion in the classroom" (Gresty & Edwards-Jones, 2012). Other examinations found that students appreciated the personalized interaction and critique between editors, reviewers, and authors. Students also benefited from the revision process (Walkington, 2012; Barrios & Weber, 2006) and developed critical thinking ability (Bauer, Ogas, Shakir, Oxley, & Clawson, 2009; Walkington, 2012) as a result of participating in an undergraduate journal.

BACKGROUND OF THE *JOURNAL OF PURDUE UNDERGRADUATE RESEARCH*

Purdue University is a large public land grant research university in the Midwest United States. Purdue enrolls 39,000 students, 77% of whom are undergraduates, and employs 1,800 tenured and tenure-track faculty (Purdue University Data Digest, 2012-2013). The school is particularly strong in STEM (science, technology, engineering, and math) disciplines, with more than half of the students enrolled in majors in those areas. It ranks 4th among colleges and universities in total STEM degrees conferred (STEM, 2013).

The original idea for the creation of a journal of undergraduate research at Purdue came from a group of faculty members from around the University convened in fall 2009 by Dr. Greg Michalski, an associate professor with dual appointments in the departments of Earth, Atmospheric, and Planetary Sciences (EAPS) and Chemistry. These colleagues recognized that although Purdue undergraduates were involved in over 2,000 student research projects annually there were few opportunities to showcase their research. While an annual poster session organized by the Colleges of Science, Engineering, and Technology provided a short-term opportunity, when the posters came down there was little tangible record of student achievement. There were also two well-organized undergraduate research programs on campus that provided some coaching in the communication of research (the Discovery Park Undergraduate Research Internship program (DURI) and the Summer Undergraduate Research Fellowships (SURF) program in the College of Engineering), but most undergraduates lacked opportunities to carry their research through to a publication that would provide them with credit for their efforts. If their work was of a quality to be published in a disciplinary journal, the student would be one of a long list of authors, and their particular contribution would be indiscernible to graduate schools or potential employers.

How to sustain a new publication was one of the central topics of discussion of the faculty group. An analysis of the list of undergraduate research journals on the Council for Undergraduate Research (CUR) website revealed that almost half of the 65 publications listed in 2009 either had broken links or displayed "current issues" over two years old. A consistent feature of the journals that were struggling was that they appeared to be entirely student run, with the inevitable problems of staff turnover, while successful and sustainable publications always had a permanent home within the institution, usually within a dedicated office of undergraduate research. Since Purdue's model of undergraduate research administration was decentralized, with initiatives located at the College level, there seemed little opportunity of establishing a central office of undergraduate research. The group therefore looked for another institutional partner and found one in the Libraries.

Like an increasing number of academic libraries, Purdue University Libraries provides publishing support services to its institutional community. In 2009, Purdue University Press had been moved into the Libraries, and there was enthusiasm about exploring new relationships which could combine the publishing skills of the Press with use of Purdue e-Pubs, the Digital Commons-based institutional repository platform that features powerful publishing features. Publishing an undergraduate research journal was particularly appealing because it connected the scholarly communication program of the Libraries with strategic goals around information literacy (as noted by librarians at other institutions [Gilman, 2013, p. 76]).

The faculty group and Libraries staff submitted a proposal to create the *Journal of Purdue Undergraduate Research* (JPUR) to the Provost's Office in 2010. The support requested for a three year launch period was

$30,000 per annum, primarily for the employment of a half-time undergraduate student journal coordinator and printing costs. It was felt that a handsome printed version of the journal would be an important companion to an Open Access online version so that student authors would have a tangible object to show potential graduate schools and employers and that the institution would be able to use it as a marketing piece to attract good candidates and interest donors. The detailed proposal covered aims, context, format, governance and staffing, budget, and timeline.

The Provost, Dr. Timothy Sands, and the Vice Provost for Undergraduate Academic Affairs, Dr. Dale Whittaker, were supportive of the initiative. (And Dr. Whittaker agreed to serve as the journal's continuing advisor.) The initial funding was granted and has recently been renewed on a non-recurring annual basis. However, both Dr. Sands and Dr. Whittaker placed a strong emphasis on the need for the journal to include a robust assessment plan which would assess the degree to which the publication of the journal contributed to the success of Purdue students. Purdue defines student success as "increased rate of student degree completion, future employment or study, dedicated citizenship, and responsible leadership in the state, nation, and world" (About Student Success, n.d.). Making a convincing link between the journal and student success was an unfamiliar challenge to the publishing staff, since journal impact is generally measured through usage or citation. The availability of expert help in creating an assessment tool in the person of the W. Wayne Booker Chair of Information Literacy was therefore an early and important criterion for success.

Once funding was approved, work immediately began on the first issue. A Faculty Advisory Board consisting of members of the original faculty group who had initiated the journal and colleagues from a broad spread of disciplines was established under the chairmanship of Dr. Michalski. The Advisory Board identified and implemented ways for the students to submit strong proposals and develop high quality papers. These included: a web site populated with customized learning resources ("Policies"[1] and "Tips for Authors"[2]); "Writing Winning Proposals" seminars on preparing submissions; faculty reviewer feedback for students who submitted abstract proposals; writing development workshops for accepted authors; and peer mentors for each article author drawn from the journal's Student Editorial Board. Table 1 shows the characteristics of each volume including number of submissions, acceptance rates, number of articles and research snapshots published, and number of authors/co-authors.

Next, a student journal coordinator was selected and calls for proposals were sent. *The Journal of Purdue Undergraduate Research*[3] published its first annual volume in August 2011 with this stated purpose, which includes

[1] http://docs.lib.purdue.edu/jpur/policies.html
[2] http://docs.lib.purdue.edu/jpur/tips_for_authors.html
[3] http://docs.lib.purdue.edu/jpur/

Table 1. Characteristics of JPUR volumes 2011-2013

Characteristic	2011	2012	2013	Total
# of abstracts submitted	43	83	74	200
# of articles published	7	11	11	29
# of article authors (includes co-authors)	15	12	18	45
# of research snapshots published	N/A*	38	36	74
# of snapshot authors (includes co-authors)	N/A*	45	52	97
Acceptance rate for articles and snapshots	16%*	59%	64%	52%

*No research snapshots published in 2011

explicit ties to student success, as well as the promotional value of the journal:

> …to further encourage the development of undergraduate research at Purdue by showcasing the best work in a tangible, centralized, and public way. JPUR will be of benefit to students, faculty, and administration:
>
> - Student authors will benefit from experiencing the scholarly publishing process; from submission, through review and development, to formal publication. They will learn valuable lessons in scientific writing and publication ethics. Published articles will be tangible evidence of achievement, valuable for their future careers.
> - Student editors will learn about the publishing process from behind the scenes, better preparing them to be the academic authors of the future.
> - Faculty will be encouraged by the richness of undergraduate research activity in the University, and motivated to act as mentors. Working toward an end goal of publication, whether it is in JPUR or the journal of a disciplinary society, provides teaching moments to develop information literacy knowledge.
> - For University Administration, the journal will provide an undergraduate recruiting and retention device, K-12 outreach material, and a fund raising tool. JPUR will advertise Purdue as a place where undergraduates are involved with innovative research early and often.
> - The professional electronic edition of the journal will reach global audiences (this impact will be tracked using usage analysis tools), strengthening Purdue's ability to attract outstanding international students.[4]

JPUR publishes full-length articles, interviews, and editorials. It also publishes research snapshots, which are lengthy summaries of research. There are two annual deadlines for students to submit abstracts for consideration (currently November 15 and February 15). Purdue faculty who are experts in the topic of each submission provide reviews. The Faculty Advisory Board then selects the articles and snapshots for inclusion. Peer mentoring and developmental editing is handled by the Student Editorial Board led by the student Journal Coordinator (a role successively occupied by Paul Sliker, Richelle Wescott, Elizabeth Hudson, and Brooke Halteman). The student editors and authors are supported by writing workshops jointly organized by the Libraries and the Purdue Writing Lab in the Department of English. While copyediting and design assistance is provided by the staff of Purdue University Press, the design of the journal over the last three years has been the work of undergraduate interns supervised by staff from Purdue Marketing and Media. The journal can thus reasonably claim to be not only student authored but also student produced, even though a partnership between the Press/Libraries, the Department of English, and Purdue Marketing and Media supports their efforts and ensures sustainability.

ASSESSMENT OF THE *JOURNAL OF PURDUE UNDERGRADUATE RESEARCH*

Assessment produces data that can help in understanding what students learned and whether that learning aligned with the outcomes defined. Assessment can be "formative, meaning a process for exploration, revision, and improvement; and summative, meaning a process for determining merit and making administrative decisions about people or programs" (Theall, 2006, p. 2497).

There are few publications that describe the results of an assessment of an undergraduate research journal (Davis-Kahl & Hensley, 2013; Leekley, Davis-Kahl, & Seeborg, 2013; Morris et al., 2006; Walkington, 2012), while some authors have commented on future plans to assess the impact of their journals (Farney & Byerley 2010). This is clearly an area in which more work needs to be done. The publication of an undergraduate research journal requires resources, and data gathered through assessment can demonstrate whether a journal contributes to student success, and thus can help justify decisions about the priority of allocating resources to this activity.

METHODS

The assessment plan

The assessment plan for JPUR included formative and summative assessment based on the journal's stated

[4] http://docs.lib.purdue.edu/jpur/about.html

purpose. The plan included the following stakeholder groups:

- **Student authors of JPUR articles.** These students experienced a competitive and intensive period of writing with mentoring from a peer and a faculty member. The assessment addressed their learning and experience with the process.
- **The Student Editorial Board mentors.** These students provided an evaluation of the growth in knowledge, skills, and abilities in the mentee's article-writing. They self-reported their perceived gains in learning resulting from their mentoring role.
- **Students whose abstracts were not accepted.** Some of these students received comments from the reviewers of their proposals that may have resulted in learning gains.
- **Students who attended JPUR-hosted workshops.** These students were asked to fill out workshop evaluations.
- **Faculty Advisory Board.** The Board reviewed submissions and selected abstracts to be expanded into papers for publication or as research snapshots.
- **Faculty mentors of student authors.** Faculty mentors (the students' faculty research advisors) provided their perspective on the student author's growth in knowledge, skills, and abilities about the article-writing process. They were also asked about their interest in participating in the process. Burks and Chumchal (2009) identified from the literature reasons why faculty should publish with undergraduates: there are excellent opportunities for deep learning about scholarly writing, ethics, and the scientific method; it demonstrates broader impact for funding agencies; it may be viewed positively by promotion and tenure committees; and it is a rewarding experience.
- **Faculty mentors of students whose abstracts were not accepted.** These faculty agreed to help a student submit an abstract for consideration and help with the article, if accepted.
- **University administrators.** They could provide a perspective on the usefulness of JPUR as a marketing, fundraising, and recruiting tool. Such publications can help recruit students to a school (Burks & Chumchal, 2009), while a showcase for a rich undergraduate experience is a valuable tool for Advancement professionals.

The assessment methodology consisted of questionnaires for the stakeholder groups, workshop evaluations, and web metrics:

- Online surveys were developed for each of the stakeholder groups and distributed annually to them after students submitted final versions of their papers. These were summative assessments in evaluating perceptions at the end of the publishing process. They were formative in providing data for continuous improvement of the journal. Participation in the writing of an article requires competence in information literacy, so many of the items in the surveys probed for gains in this area. The Faculty Advisory Board received surveys only in 2011; university administrators will receive surveys at a later date. The Purdue Institutional Review Board approved the study as exempt. Appendix 1 consists of the email messages and survey questions.
- Students who attended the workshops were asked to complete evaluations. This was a formative assessment.
- The use of web metrics from Google Analytics[5] and Purdue's e-Pubs institutional repository[6] downloads provided data relating to usage. Such metrics provide data about usage of online resources, providing an additional dimension for assessing impact, although not student success (Eccles, Thelwall, & Meyer 2012).

Data were collected and reports compiled for three years from 2011-2013. Some changes to processes were made each year based on the results of the assessments. This paper focuses on student learning gains as a result of participating in JPUR.

RESULTS

Table 2 (following page) shows that the response rates for student authors of accepted articles and snapshots ranged

[5] http://www.google.com/analytics/
[6] http://docs.lib.purdue.edu/

from 43% to 73%. The response rate for faculty mentors of student article and research snapshot authors ranged from 27% to 91%. The response rate for Student Editorial Board members ranged from 22% to 100%. The Faculty Advisory Board received surveys once in 2011, and the response rate was 58%. The following are the results of the assessments for each stakeholder group. (Note: Data for non-accepted student authors or their faculty mentors are not included due to low response rates and overall number of respondents in these categories.)

Students

The student authors and members of the Student Editorial Board were asked whether they had gained in learning in specific areas as a result of writing for JPUR or mentoring a student author. Table 3 (following page) details the self-reported learning gains. From 8% (n=1) to 94% (n=17) of the students reported some learning gains in **each of the areas** about which they were asked:

- How to write for professional publication
- How to write about research for an informed public audience
- The process for publishing an article
- How scholarly publication contributes to the research community
- How to identify and paraphrase the main ideas from an article or book
- How to synthesize information from multiple sources

Table 2. Survey response rates

Survey Recipient	2011 Response Rate (contacted/completed)	2012 Response Rate (contacted/completed)	2013 Response Rate (contacted/completed)	Total
Student authors of published articles	43% (7/3)	73% (11/8)	61% (18/11)	61% (36/22)
Student authors of research snapshots	N/A*	50% (42/21)	65% (52/34)	59% (94/55)
Student authors of non-accepted abstracts	8% (25/2)	10% (21/2)	6% (17/1)	8% (63/5)
Student Editorial Board members	100% (5/5)	22% (9/2)	63% (8/5)	55% (22/12)
Faculty mentors of student authors	71% (7/5)	27% (11/3)	71% (17/12)	57% (35/20)
Faculty mentors of snapshot authors	N/A*	63% (38/24)	91% (33/30)	76% (71/54)
Faculty mentors of students with non-accepted abstracts	13% (24/3)	23% (21/5)	N/A	18% (45/8)
Faculty Advisory Board	58% (12/7)	N/A	N/A	58% (12/7)

*No research snapshots published in 2011

Table 3. Student self-reports of learning gains as a result of writing for JPUR, 2011-2013

Competency	Article Authors Reporting Gains (total respondents=18)	Snapshot* Authors Reporting Gains (total respondents=54)	Editorial Board Members Reporting Gains (total respondents=12)
How to write for professional publication	13 72%	27 50%	2 17%
How to write about research for an informed public audience	14 78%	31 57%	3 25%
The process for publishing an article	17 94%	26 48%	5 42%
How scholarly publication contributes to the research community	10 56%	29 54%	4 33%
How to identify and paraphrase the main ideas from an article or book	12 67%	29 54%	4 33%
How to synthesize information from multiple sources	9 50%	31 57%	2 17%
How to use evidence to draw conclusions	11 61%	28 52%	2 17%
How to support my points with evidence	11 61%	31 57%	3 25%
How to evaluate the credibility of authors of articles/books/reports	11 61%	30 56%	5 42%
When to cite other authors in a paper	9 50%	25 46%	1 8%
How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies	6 33%	20 37%	4 33%
How to use a publication style manual to format papers or bibliographies	9 50%	21 39%	4 33%
How to construct spreadsheets, charts, or graphs to display information	9 50%	26 48%	1 8%
How to work collaboratively	11 61%	31 57%	1 8%

*Research snapshots were published in 2012 and 2013

- How to use evidence to draw conclusions
- How to support my points with evidence
- How to evaluate the credibility of authors of articles/books/reports
- When to cite other authors in a paper
- How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
- How to use a publication style manual to format papers or bibliographies
- How to construct spreadsheets, charts, or graphs to display information
- How to work collaboratively

Of all student groups surveyed (article authors, abstract authors, editorial board members), student article authors reported the most learning gains. Almost all of those students gained in understanding the process for publishing an article (n=17, 94%). The least gains in this group occurred in how to use a citation manager (n=6, 33%).

More than half of the research snapshot authors reported learning in all areas except:

- The process for publishing an article (n=26, 48%)
- How to construct spreadsheets, charts, or graphs to display information (n=26, 48%)
- How to use a citation manager (n=20, 37%)
- How to use a publication style manual to format papers or bibliographies (n=21, 39%)

The Student Editorial Board members' primary gains (n=5, 42%) were in understanding the process for publishing an article and how to evaluate the credibility of authors. They gained least (n=1, 8%) in the areas of how to construct spreadsheets, charts, or graphs to display information and how to work collaboratively.

The student article authors were asked about techniques they learned to find articles and other sources for their literature reviews by writing an article for JPUR. Most of the students learned how to broaden or narrow their search topic (n=14, 64%) and how to retrieve the full text of journal articles (n=13, 59%). Fewer learned to set Google Scholar preferences to search for articles available through the Purdue Libraries (n=6, 27%); about databases of citations to articles about their subject (n=5, 23%); and about the Libraries' interlibrary loan service (n=3, 14%).

To triangulate the self-reports of learning by student authors, the faculty, Student Editorial Board mentors, and Faculty Advisory Board members were asked whether they believed that student authors gained a better understanding of the same areas as a result of writing an article for JPUR. Table 4 (following page) shows that most of the faculty mentor respondents perceived that the students learned in all areas, except how to use a citation manager (n=7, 35%). Most of the Student Editorial Board members perceived that the authors learned in all areas. Most of the faculty mentors of authors of research snapshots perceived that the students learned in all areas except how to use a publication style manual to format papers or bibliographies (n=26, 48%) and how to use a citation manager (n=16, 30%).

The student article authors were asked about the helpfulness of particular resources in helping them learn to write their articles. These resources included the faculty mentor, student Editorial Board mentor, workshops, the JPUR web site, and Writing Lab (OWL Online Lab[7] and in-person appointments). Table 5 (p. 11) shows that the students found all of the resources helpful.

The student article authors could select multiple reasons when asked why they decided to write an article for JPUR. The most frequently cited reason was to be more competitive as a graduate school applicant (n=16, 73%). Other reasons were to be more appealing to future potential employers (n=13, 59%); because they enjoyed conducting and writing scholarly research (n=11, 50%); and because their faculty mentor encouraged them to do so (n=10, 45%).

When asked whether they would consider publishing articles in the future, all but one of the article authors (n=21, 95%) indicated that they intended to publish at least one scholarly article as a result of preparing an article for JPUR. Almost half of the snapshot authors

[7] https://owl.english.purdue.edu/owl/

Table 4. Percentage of faculty and student mentors (2011-2013) and Faculty Advisory Board members (2011) who perceived some or sufficient student author learning gains during the process of writing an article for JPUR

Competency	Faculty Mentors of Article Authors (total respondents=20)	Student Mentors (total respondents=12)	Faculty Mentors of Snapshot* Authors (total respondents=54)	Faculty Advisory Board** (total respondents=7)
How to write for professional publication	18 90%	12 100%	45 83%	7 100%
How to write about research for an informed public audience	18 90%	12 100%	51 94%	7 100%
The process for publishing an article	17 85%	11 92%	32 59%	7 100%
How scholarly publication contributes to the research community	14 70%	11 92%	41 76%	6 86%
How to identify and paraphrase the main ideas from an article or book	14 70%	11 92%	45 83%	6 86%
How to synthesize information from multiple sources	17 85%	11 92%	41 76%	7 100%
How to use evidence to draw conclusions	18 90%	11 92%	44 81%	7 100%
How to support their points with evidence	16 80%	11 92%	43 80%	7 100%
How to evaluate the credibility of authors of articles/books/reports	13 65%	12 100%	29 54%	6 86%
When to cite other authors in a paper	16 80%	12 100%	31 57%	7 100%
How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies	7 35%	7 58%	16 30%	4 67%
How to use a publication style manual to format papers or bibliographies	13 65%	11 92%	26 48%	6 86%
How to construct spreadsheets, charts, or graphs to display information	15 75%	11 92%	30 56%	6 86%
How to work collaboratively	16 80%	10 83%	41 76%	6 86%

* Research snapshots were instituted in 2012, so the table data are from 2012 and 2013

** The Faculty Advisory Board received surveys only in 2011

Table 5. Student authors 2011-2013 who used resources and found them helpful or somewhat helpful

Resource	Article Authors Found Helpful n=22	Snapshot Authors Found Helpful n=55
Faculty mentor	21 95%	51 93%
Student mentor (Editorial Board member)	19 86%	No data
Article-writing workshops (2 each in 2011 and 2012; online on-demand in 2013)	29*	50*
JPUR web site	14 64%	41 75%
Purdue Writing Lab (Online OWL or in-person appt.)	14 64%	27 49%

* Students could attend more than one workshop

(n=35, 46%) intended to publish again. This finding agrees with Walkington's analysis (2012).

Around 20% of the article authors (n=5; 23%) and snapshot authors (n=15, 20%) decided to pursue a career in research in her/his field of study **as a result of writing an article for JPUR**.

As a result of serving as an Editorial Board member, all of the students (n=12) reported that they learned that they enjoyed scholarly writing. Most of them learned that they enjoyed editorial work (n=11, 92%) and teaching (n=8, 67%). A student commented:

> It was an amazing experience and it allowed me to get a taste for what I would be doing when I graduated college. It was a step in the right direction for me professional experience-wise and I am much better because of it.

Faculty mentors

More than half of the faculty mentors responded to the surveys. Most of the faculty mentors of article (n=17, 85%) and snapshot (n=44, 81%) authors responded that they would mentor a student who wanted to publish an article in JPUR again. Two comments were:

> This experience enhances their skills and makes them more valuable to potential employers.

> It is rewarding to work with undergraduates who are enthusiastic about research. It is also a nice way to identify potential graduate students to study in our department.

Web Metrics

Between October 1, 2011 and September 1, 2013, JPUR received 13,980 total visits; 10,581 unique visitors; and 24,887 page views. Most of the total visits (86%, n=12,009) originated in the US; other countries represented less than 2% each of the visits.

JPUR articles were deposited in the Purdue institutional repository, Purdue e-Pubs.[8] COUNTER-compliant statistics show that articles were downloaded from e-Pubs 13,739 times between October 1, 2011 and September 1, 2013.

[8] http://docs.lib.purdue.edu/

JPUR articles are allocated DOIs on publication. An innovation in 2013 was to add an altmetric.com button to each article to track mentions through social media and on the open web (Konkiel and Scherer, 2013); however, it is too early to see substantial impact.

DISCUSSION

Since 2011, one hundred forty-two students have authored or co-authored articles or research snapshots for JPUR. An additional twenty-nine students were members of the Student Editorial Board and mentored student authors. The results of the assessment presented here demonstrate that, for these students, JPUR has had a positive impact on their current and future success.

Connecting to "success"

It is clear from the student and faculty feedback, and the journal's metrics, that JPUR is fulfilling at least three aspects of its stated purpose (as articulated earlier):

- JPUR publicly and centrally showcases the work of undergraduate students.
- Student authors benefit from experiencing the full spectrum of the scholarly publishing process and learn about scientific writing and publication ethics.
- Students have developed important information literacy competencies.

Importantly, the assessment data also directly address "success" as defined by Purdue (and the Provost): an "increased rate of student degree completion, future employment or study, dedicated citizenship, and responsible leadership in the state, nation, and world" (About Student Success, n.d.). Not only did 20% of the student article authors indicate a desire to pursue a career in research in their respective fields of study as a result of writing an article for JPUR, but the learning gains reported by student authors indicate that those students will be better prepared for "future employment or study" in their fields as well. Students' interest in publishing again (all but one of the article authors and half of the snapshot authors would consider publishing articles in the future) is also a positive indicator for their future involvement and leadership within their disciplines.

JPUR and information literacy

An important component in preparing students for future success—and one which is directly addressed by JPUR—is building student competence in finding and using information (information literacy). The American Association of Colleges & Universities identifies information literacy as an essential learning outcome for undergraduate students,[9] and at Purdue, information literacy is one of the expected core learning outcomes for undergraduate students. Since writing a paper for publication involves many distinct information literacy competencies, JPUR directly addresses several important areas for student learning (e.g., how to synthesize information, how to use evidence to draw conclusions, how to evaluate the credibility of authors, how to properly cite others' work, et al.). The assessment of JPUR shows that students gained in learning (and in information literacy competency) as a result of writing an article for JPUR. Student article authors reported the most gains, conceivably because they had the most involvement with the article-writing process.

Connecting core information literacy competencies to learning gains achieved through participation in JPUR is significant because both the ability to use information and to communicate effectively in writing are expected of students by higher education accreditation agencies, by organizations that define expected college study learning outcomes, and by employers. For example, many colleges accredited by the Southern Association of Colleges and Universities have prepared institution-wide improvement plans focused on information literacy,[10] and recent studies of employers indicate that new graduates and employees in general need, but lack, competency in written communication (Weiner 2011). Student involvement in JPUR can demonstrate student achievement of these skills to both accreditors and future employers.

Areas for further emphasis

While the students who wrote for JPUR gained an experiential understanding of how to communicate professionally with others in their discipline, there were some areas identified through the assessment in which learning gains were not as strong as hoped. Less learning

[9] http://www.aacu.org/leap/vision.cfm
[10] See http://libguides.trinity.edu/qep

occurred in how to use a citation manager; in how to set Google Scholar preferences; how to access specialists databases in their subject of inquiry; and about the interlibrary loan service. This raises questions about how the students found citations for their articles; whether they did thorough searches; and whether and how they obtained full text for those articles not available through the university libraries. Discussion with the student authors while they are writing their papers could provide further insight into this, and further training about the mechanics of using library platforms may be needed.

In addition, although the Student Editorial Board members gained in learning in areas related to their mentoring responsibilities (*understanding the process for publishing an article* and *evaluating author credibility*), it is interesting to note that they felt they gained least in how to work collaboratively—a seemingly essential skill for their role and a characteristic of research groups that is important for undergraduate researchers to understand (Hill 2011, 336). This finding is also contrary to the findings about student staff of another undergraduate research journal: "learning to work with others' was one of the most frequently mentioned talents [student] staff took away from their time with *PennScience*" (Morris et al., 2006). However, *PennScience* is a student-run journal that developed a team-based model for its organizational structure, and its emphasis on teamwork may explain the difference in findings. Further exploration would reveal whether the students involved with JPUR will need additional training in this area.

Collaborating for student success

The collaboration and investment of the time and resources of the Provost, University Press and Libraries, Faculty Advisory Board, Department of English, Purdue Marketing and Media, and faculty mentors resulted in influencing the learning and the lives of the students involved. This intra-institutional cooperation demonstrates the importance of leveraging the strengths of multiple stakeholders in service of student learning. Clearly, the success of JPUR (and its student participants) has been enhanced by each group's participation, whether in the journal itself or in its learning support activities (workshops, mentoring, and web resources). For example, the Libraries' central location within Purdue, its promotion of scholarly communication and information literacy, and its knowledge of scholarly publishing (supported by the positioning of Purdue University Press as an integral part of the Libraries) has provided a logical home for the production of the journal. The Libraries' organizational support provides an ideal foundation for the stability of JPUR, ensures its continued professionalism, and allows faculty mentors and the Faculty Advisory Board to focus on student learning.

Recommendations for other institutions

For the community of library publishers who are investing in publishing undergraduate research, the JPUR model provides a strong example of the benefit of such initiatives—as well as a method of gathering much needed assessment data for funders and administrators. Other institutions that are considering the establishment of an undergraduate research journal or that want to assess the student learning associated with one already established should consider these recommendations:

1. **Engage all of the relevant stakeholder groups** in the process of writing, mentoring, and decision-making. The response rate for the surveys of more than 50% for most categories of stakeholders, which is considered good for social sciences research (Babbie, 2007), is an indication of their commitment and engagement.
2. Identify specifically **what the students should learn** as a result of participating in the journal. This will very likely include information literacy competencies. This can be the basis for developing instruments that measure student learning outcomes.
3. **Plan learning resources** that will help the journal achieve its outcomes. Those resources can be people (mentors), formal learning situations (workshops), or objects (instructions, guides, tutorials, and lectures linked to the journal web site).
4. **Use assessment data** to determine the learning resources to make available. The Student Editorial Board learned least about how to construct spreadsheets, charts, or graphs to display information and how to work collaboratively, so these may be areas that need reinforcement.
5. Consider the timing of the **schedule of publication** (Walkington, 2012) and **distribution**

of the assessment instruments carefully to maximize response rates.

6. **Advertise the advantages** of publishing in the journal as incentives to students to submit abstracts/proposals. The primary reason that student authors decided to write for JPUR was to be more competitive in applying to graduate school.

CONCLUSION

Undergraduate research is an educational experience that has a positive influence on learning and documenting the results of that research through a published paper further reinforces learning and "closes the loop" of the scholarly communication process for students. As one Purdue faculty member commented, with regard to the value of the journal in teaching a holistic approach to communicating research:

> JPUR has a slightly different writing style, which allowed me to tone it back a bit with my student in terms of the high-end scholarly writing and really just focus on analyzing data and synthesizing the findings into a comprehensive and tight piece. It was more about the complete process.

Participating in the scholarly publication process can not only provide demonstrable learning gains for students, but can also influence their choices of careers and decisions to write scholarly articles in the future. Faculty and student mentoring, workshops, and online learning resources (as provided at Purdue) can support students during this process and help improve learning.

While it is easy to state that student learning is the goal for an undergraduate journal, it is important to have a well-planned assessment strategy that can confirm that the journal is actually accomplishing this purpose. Particularly for library-publishing journals, it is important (and useful) to connect any assessment with information literacy competencies, as the staff of JPUR have done at Purdue. This will not only help connect the journal with the library's strategic plan, but can also help the demonstrate student achievement in these areas to administrators. At Purdue, JPUR staff have made annual presentations to the Provost's leadership group (which includes senior staff from the Office of the Provost as well as Deans of the colleges), using assessment results to show the impact of the journal (and to seek continued assistance from these academic leaders in recruiting proposals for the next year).

Next steps for JPUR

To assure continued support for, and improvement of, JPUR, the annual assessment of student learning related to participating in the journal, faculty and peer mentoring, and workshops will continue. As a result of the assessment data shared in this paper, JPUR staff will add links to additional learning resources on the journal website. These resources will address areas where student learning gains were lower than expected: using a citation manager; constructing spreadsheets, charts, and graphs to display information; setting Google Scholar preferences to search for articles available through the Purdue Libraries; and strategies for working collaboratively. Links to subject-based citation databases and interlibrary loan services will also be added. Finally, to address emergent areas in scholarly communication, JPUR staff plan to expand the training offered to student authors to include discussion of research data management and further exploration of the importance of author rights.

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CORRESPONDING AUTHOR

Sharon A. Weiner
Professor and
W. Wayne Booker Chair in Information Literacy

Purdue University Libraries
504 W. State Street
West Lafayette, IN 47907-2058

sweiner@purdue.edu

APPENDIX 1.
JPUR ASSESSMENT EMAIL MESSAGES AND SURVEY QUESTIONS FOR EACH STAKEHOLDER GROUP

INITIAL CONTACT EMAIL TO POTENTIAL PARTICIPANTS; SURVEY QUESTIONS

Student Authors

Initial Contact Email

We are conducting an assessment of the Journal of Purdue Undergraduate Research (JPUR). As the author of one of the articles selected, your experience is very important to us! Please take a few minutes to respond to eight important questions. This is the link to the anonymous online survey:

[SURVEY LINK]

The deadline for responding is ____. Thank you, in advance, for providing us with your perspective!

Sincerely,
Charles Watkinson
Director, Purdue University Press

Sharon Weiner
Professor and W. Wayne Booker Chair in Information Literacy

The Survey

As the author of one of the articles selected for JPUR, your experience is very important to us!

1. BEFORE I WROTE AN ARTICLE for JPUR, I would rate my understanding of each of the following skills as:

[Options include: __None __Very little __Some __Sufficient]

___ How to write for professional publication
___ How to write about research for an informed public audience
___ The process for publishing an article
___ How scholarly publication contributes to the research community
___ How to identify and paraphrase the main ideas from an article or book
___ How to synthesize information from multiple sources
___ How to use evidence to draw conclusions
___ How to support my points with evidence
___ How to evaluate the credibility of authors of articles/books/reports
___ When to cite other authors in a paper
___ How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
___ How to use a publication style manual to format papers or bibliographies

___ How to construct spreadsheets, charts, or graphs to display information
___ How to work collaboratively

2. AS A RESULT OF WRITING AN ARTICLE for JPUR, I would rate my current understanding of each of the following skills as:

[Options include: __None __Very little __Some __Sufficient]

___ How to write for professional publication
___ How to write about research for an informed public audience
___ The process for publishing an article
___ How scholarly publication contributes to the research community
___ How to identify and paraphrase the main ideas from an article or book
___ How to synthesize information from multiple sources
___ How to use evidence to draw conclusions
___ How to support my points with evidence
___ How to evaluate the credibility of authors of articles/books/reports
___ When to cite other authors in a paper
___ How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
___ How to use a publication style manual to format papers or bibliographies
___ How to construct spreadsheets, charts, or graphs to display information
___ How to work collaboratively

3. How helpful were the following resources in helping you learn to write your article?

[Options include: __ Didn't use __Used but not helpful __Used and somewhat helpful __Used and was very helpful]

___ Faculty Mentor
___ Student Editorial Board
___ Workshop: 'Abstracts to Articles: Preparing Your Article for JPUR—Part 1' ([workshop date])
___ Workshop: 'Abstracts to Articles: Preparing Your Article for JPUR—Part 2' ([workshop date])
___ JPUR Website
___ Purdue's Online Writing Lab (OWL)

4. Please indicate how the process of writing an article for JPUR influenced decisions about your career.

___ As a result of writing an article for JPUR, I decided to pursue a career in research in my field of study.
___ As a result of writing an article for JPUR, I decided to pursue a career in research in a different field of study.
___ As a result of writing an article for JPUR, I decided not to pursue a career in research.
___ Writing an article for JPUR did not influence my career decisions.

5. What techniques did you learn about finding articles and other sources for your literature review by writing an article for JPUR? (Check all that apply)

___ I learned about databases of citations to articles about my subject (examples are: Academic Search Premier, ProQuest, BIOSIS, CAB, ERIC)
___ I learned how to retrieve the full text of journal articles

___ I learned to set Google Scholar preferences to search for articles available through Purdue Libraries
___ I learned how to broaden or narrow my search topic
___ I learned about the Libraries' Interlibrary Loan service

6. How did you find out about JPUR?

___ From a professor
___ From an e-mail announcement about JPUR
___ From another student
___ From a presentation by JPUR staff
___ From a leaflet or postcard
___ From the SURF program staff
___ From the DURI program staff
___ Other [please specify]

7. Which factors contributed to your decision to write an article for JPUR? (Check all that apply)

___ I wanted to be more competitive as a graduate school applicant.
___ I wanted to be more appealing to future potential employers.
___ I wanted to work more closely with a faculty mentor.
___ My faculty mentor encouraged me to do so.
___ I enjoy conducting and writing scholarly research.

8. As a result of preparing an article for JPUR, how would you describe your attitude regarding publishing articles in the future?

___ I do not intend to publish scholarly articles in the future.
___ I have not decided whether I will publish scholarly articles in the future.
___ I intend to publish at least one scholarly article in the future.

9. Are you willing to allow JPUR to anonymously use comments you provided in this survey to help promote the journal?

___Yes, JPUR may use my comments.
___No, JPUR may not use my comments.

Thank you for your participation in helping us to assess the *Journal of Purdue Undergraduate Research*. Please send an email to [contact name] at [contact email address] with the Subject Line: *JPUR Follow-up* if you would like to provide any additional information about your experience or the journal, or if you would like information regarding JPUR [the following year].

Student Editorial Board Members

Initial Contact Email

We are conducting an assessment of the Journal of Purdue Undergraduate Research (JPUR). As a member of the student editorial board, your experience is very important to us! Please take a few minutes to respond to six important questions. This is the link to the anonymous online survey:

[SURVEY LINK]

The deadline for responding is [date]. Thank you, in advance, for providing us with your perspective!

Sincerely,
Charles Watkinson
Director, Purdue University Press

Sharon Weiner
Professor and W. Wayne Booker Chair in Information Literacy

The Survey

As a member of the student editorial board for JPUR, your experience is very important to us!

1. BEFORE I MENTORED A STUDENT in preparing an article for JPUR, I would rate my understanding of each of the following skills as:

[Options include: __None __Very Little __Some __Sufficient]

___ How to write for professional publication
___ How to write about research for an informed public audience
___ The process for publishing an article
___ How scholarly publication contributes to the research community
___ How to identify and paraphrase the main ideas from an article or book
___ How to synthesize information from multiple sources
___ How to use evidence to draw conclusions
___ How to evaluate the credibility of authors of articles/books/reports
___ How to support my points with evidence
___ When to cite other authors in a paper
___ How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
___ How to use a publication style manual to format papers or bibliographies
___ How to construct spreadsheets, charts, or graphs to display information
___ How to work collaboratively

2. AS A RESULT OF MENTORING A STUDENT to prepare an article for JPUR, I would rate my current understanding of each of the following skills as:

[Options include: __None __Very Little __Some__Sufficient]

___ How to write for professional publication
___ How to write about research for an informed public audience
___ The process for publishing an article
___ How scholarly publication contributes to the research community
___ How to identify and paraphrase the main ideas from an article or book
___ How to synthesize information from multiple sources
___ How to use evidence to draw conclusions
___ How to evaluate the credibility of authors of articles/books/reports
___ How to support my points with evidence
___ When to cite other authors in a paper
___ How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
___ How to use a publication style manual to format papers or bibliographies
___ How to construct spreadsheets, charts, or graphs to display information
___ How to work collaboratively

3. Do you believe that THE STUDENT AUTHOR(s) with whom you worked gained a better understanding of the following areas as a result of writing an article for JPUR?

[Options include: __None __Very Little __Some __Sufficient]

___ How to write for professional publication
___ How to write about research for an informed public audience
___ The process for publishing an article
___ How scholarly publication contributes to the research community
___ How to identify and paraphrase the main ideas from an article or book
___ How to synthesize information from multiple sources
___ How to use evidence to draw conclusions
___ How to evaluate the credibility of authors of articles/books/reports
___ How to support their points with evidence
___ When to cite other authors in a paper
___ How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
___ How to use a publication style manual to format papers or bibliographies
___ How to construct spreadsheets, charts, or graphs to display information
___ How to work collaboratively

4. In what ways has the experience of serving as an editorial board member influenced you? (Check all that apply)

___ I have learned that I enjoy teaching.
___ I have learned that I do not enjoy teaching.
___ I have learned that I enjoy editorial work.
___ I have learned that I do not enjoy editorial work.
___ I have learned that I enjoy scholarly writing.
___ I have learned that I do not enjoy scholarly writing.

[Essay text box]

5. If given the opportunity, would you like to edit an article for JPUR again?

___ Yes
___ Maybe
___ No

[If yes, ask 'Why?'
If no, ask 'Why not?']

[Essay text box]

6. How did you find out about JPUR?

___ From a professor
___ From an e-mail announcement about JPUR
___ From another student
___ From a presentation by JPUR staff
___ From a leaflet or postcard
___ From the SURF program staff
___ From the DURI program staff
___ Other [please specify]

7. Are you willing to allow JPUR to anonymously use comments you provided in this survey to help promote the journal?

___ Yes, JPUR may use my comments.
___ No, JPUR may not use my comments

Thank you for your participation in helping us to assess the *Journal of Purdue Undergraduate Research*. Please send an email to [contact name] at [contact email address] with the Subject Line: *JPUR Follow-up* if you would like to provide any additional information about your experience or the journal, or if you would like information regarding JPUR [the following year].

Faculty Mentors

Initial Contact Email

We are conducting an assessment of the Journal of Purdue Undergraduate Research (JPUR). As a mentor for a student whose article was selected, your experience is very important to us! Please take a few minutes to respond to four important questions. This is the link to the anonymous online survey:

[SURVEY LINK]

The deadline for responding is [date]. Thank you, in advance, for providing us with your perspective!

Sincerely,
Charles Watkinson
Director, Purdue University Press

Sharon Weiner
Professor and W. Wayne Booker Chair in Information Literacy

The Survey

As a mentor for a student whose article was selected, your experience is very important to us!

1. Do you think that the student author(s) with whom you worked gained a better understanding of these areas during the process of writing an article for the *Journal of Purdue Undergraduate Research* (JPUR)?

[Options include: __None __Very little __Some __Sufficient]

___ How to write for professional publication
___ How to write about research for an informed public audience
___ The process for publishing an article
___ How scholarly publication contributes to the research community
___ How to identify and paraphrase the main ideas from an article or book
___ How to synthesize information from multiple sources
___ How to use evidence to draw conclusions
___ How to support their points with evidence
___ How to evaluate the credibility of authors of articles/books/reports
___ When to cite other authors in a paper
___ How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
___ How to use a publication style manual to format papers or bibliographies
___ How to construct spreadsheets, charts, or graphs to display information
___ How to work collaboratively

2. How do you think having an article published in JPUR will influence the decisions of graduate school admissions personnel?

___ Negative Influence

___ No Influence
___ Favorable Influence

3. Would you mentor a student who wanted to publish an article in JPUR again?

___ Yes
___ Maybe
___ No

[If Yes, ask 'Why?'
If No, ask 'Why not?']

[Essay text box]

4. What comments do you have regarding mentoring a student author in publishing for JPUR? You may want to comment on the time commitment; skills the student needed to develop; or the advantages or disadvantages of mentoring an undergraduate author.

[Essay text box]

5. Are you willing to allow JPUR to anonymously use comments you provided in this survey to help promote the journal?

___ Yes, JPUR may use my comments.
___ No, JPUR may not use my comments

Thank you for your participation in helping us to assess the *Journal of Purdue Undergraduate Research*. Please send an email to [contact name] at [email address] with the Subject Line: *JPUR Follow-up* if you would like to provide any additional information about your experience or the journal, or if you would like information regarding JPUR [the following year].

Students who submitted abstracts that were not accepted

Initial Contact Email

We are conducting an assessment of the Journal of Purdue Undergraduate Research (JPUR). You have gone through the process of writing an abstract and submitting it for consideration by JPUR. Your experience is very important to us! Please take a few minutes to respond to eight important questions. This is the link to the anonymous online survey:

[SURVEY LINK]

The deadline for responding is [date]. Thank you, in advance, for providing us with your perspective!

Sincerely,
Charles Watkinson
Director, Purdue University Press

Sharon Weiner
Professor and W. Wayne Booker Chair in Information Literacy

The Survey

You have gone through the process of writing an abstract and submitting it for consideration by JPUR. We would like to ask you about what you might have learned through this process.

1. What techniques did you learn about finding articles and other sources for your literature review by writing an abstract for JPUR? (Check all that apply)

___ I learned about databases of citations to articles about my subject (examples are: Academic Search Premier, ProQuest, BIOSIS, CAB, ERIC)
___ I learned how to retrieve the full text of journal articles
___ I learned to set Google Scholar preferences to search for articles available through Purdue Libraries
___ I learned how to broaden or narrow my search topic
___ I learned about the Libraries' Interlibrary Loan service

2. BEFORE I WROTE AN ABSTRACT for JPUR, I would rate my understanding of each of the following skills as:

[Options include: __None __Very little __Some __Sufficient]

___ How to write for professional publication
___ How to write about research for an informed public audience
___ The process for publishing an article
___ How scholarly publication contributes to the research community
___ How to identify and paraphrase the main ideas from an article or book
___ How to synthesize information from multiple sources
___ How to use evidence to draw conclusions
___ How to support my points with evidence
___ How to evaluate the credibility of authors of articles/books/reports

___ When to cite other authors in a paper
___ How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
___ How to use a publication style manual to format papers or bibliographies
___ How to construct spreadsheets, charts, or graphs to display information
___ How to work collaboratively

3. AS A RESULT OF WRITING AN ABSTRACT for JPUR, I would rate my current understanding of each of the following skills as:

[Options include: __None __Very little __Some __Sufficient]

___ How to write for professional publication
___ How to write about research for an informed public audience
___ The process for publishing an article
___ How scholarly publication contributes to the research community
___ How to identify and paraphrase the main ideas from an article or book
___ How to synthesize information from multiple sources
___ How to use evidence to draw conclusions
___ How to support your points with evidence
___ How to evaluate the credibility of authors of articles/books/reports
___ When to cite other authors in a paper
___ How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
___ How to use a publication style manual to format papers or bibliographies
___ How to construct spreadsheets, charts, or graphs to display information
___ How to work collaboratively

4. How helpful were the following resources in helping you learn to write your abstract?

[Options include: __ Didn't use __Used but not helpful __Used and somewhat helpful __Used and was very helpful]

___ Faculty Mentor
___ JPUR Website
___ Purdue's Online Writing Lab (OWL)

5. Please indicate how the process of writing an abstract for JPUR influenced decisions about your career.

___ As a result of writing an abstract for JPUR, I decided to pursue a career in research in my field of study.
___ As a result of writing an abstract for JPUR, I decided to pursue a career in research in a different field of study.
___ As a result of writing an abstract for JPUR, I decided not to pursue a career in research.
___ Writing an abstract for JPUR did not influence my career decisions.

6. How did you find out about JPUR?

___ From a professor
___ From an e-mail announcement about JPUR
___ From another student
___ From a presentation by JPUR staff

___ From a leaflet or postcard
___ From the SURF program staff
___ From the DURI program staff
___ Other [please specify]

7. Which factors contributed to your decision to write an abstract for JPUR? (Check all that apply)

___ I wanted to be more competitive as a graduate school applicant.
___ I wanted to be more appealing to future potential employers.
___ I wanted to work more closely with a faculty mentor.
___ My faculty mentor encouraged me to do so.
___ I enjoy conducting and writing scholarly research.

8. As a result of preparing an abstract for JPUR, how would you describe your attitude regarding publishing articles in the future?

___ I do not intend to publish scholarly articles in the future.
___ I have not decided whether I will publish scholarly articles in the future.
___ I intend to publish at least one scholarly article in the future.

9. Are you willing to allow JPUR to anonymously use comments you provided in this survey to help promote the journal?

___Yes, JPUR may use my comments.
___No, JPUR may not use my comments

Thank you for your participation in helping us to assess the *Journal of Purdue Undergraduate Research*. Please send an email to [name] at [email address] with the Subject Line: *JPUR Follow-up* if you would like to provide any additional information about your experience or the journal, or if you would like information regarding JPUR [the following year].

Faculty who mentored students whose abstracts were not accepted

Initial Contact Email

We are conducting an assessment of the Journal of Purdue Undergraduate Research (JPUR). As a mentor for a student who submitted an abstract, your experience is very important to us! Please take a few minutes to respond to four important questions. This is the link to the anonymous online survey:

[SURVEY LINK]

The deadline for responding is [date]. Thank you, in advance, for providing us with your perspective!

Sincerely,
Charles Watkinson
Director, Purdue University Press

Sharon Weiner
Professor and W. Wayne Booker Chair in Information Literacy

The Survey

As a mentor for a student who submitted an abstract, your experience is very important to us!

1. Do you think that the student author(s) with whom you worked gained a better understanding of these areas during the process of writing an abstract for the Journal of Purdue Undergraduate Research (JPUR)?

[Options include: __None __Very little __Some __Sufficient]

___ How to write for professional publication
___ How to write about research for an informed public audience
___ The process for publishing an article
___ How scholarly publication contributes to the research community
___ How to identify and paraphrase the main ideas from an article or book
___ How to synthesize information from multiple sources
___ How to use evidence to draw conclusions
___ How to support their points with evidence
___ How to evaluate the credibility of authors of articles/books/reports
___ When to cite other authors in a paper
___ How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
___ How to use a publication style manual to format papers or bibliographies
___ How to construct spreadsheets, charts, or graphs to display information
___ How to work collaboratively

2. How do you think having an article published in JPUR will influence the decisions of graduate school admissions personnel?

___ Negative Influence

___ No Influence
___ Favorable Influence

3. Would you mentor a student who wanted to submit an abstract to JPUR again?

___ Yes
___Maybe
___ No

[If no, ask 'Why not?'
If yes, ask 'Why?']

[Essay text box]

4. What comments do you have regarding mentoring a student author in publishing for JPUR?

[Essay text box]

5. Are you willing to allow JPUR to anonymously use comments you provided in this survey to help promote the journal?

___ Yes, JPUR may use my comments.
___ No, JPUR may not use my comments

Thank you for your participation in helping us to assess the *Journal of Purdue Undergraduate Research*. Please send an email to [name] at [email address] with the Subject Line: *JPUR Follow-up* if you would like to provide any additional information about your experience or the journal, or if you would like information regarding JPUR [the following year].

Faculty Advisory Board

Initial Contact Email

We are conducting an assessment of the Journal of Purdue Undergraduate Research (JPUR). As a member of the Faculty Advisory Board, your experience is very important to us! Please take a few minutes to respond to four important questions. This is the link to the anonymous online survey:

[SURVEY LINK]

The deadline for responding is [date]. Thank you, in advance, for providing us with your perspective!

Sincerely,
Charles Watkinson
Director, Purdue University Press

Sharon Weiner
Professor and W. Wayne Booker Chair in Information Literacy

The Survey

As a member of the Faculty Advisory Board, your experience with JPUR is very important to us!

1. Do you think that student authors whose papers were published in the inaugural issue of *Journal of Purdue Undergraduate Research* (JPUR) gained a better understanding about these areas during the writing process?

[Options include: __None __Very little __Some __Sufficient]

___ How to write for professional publication
___ How to write about research for an informed public audience
___ The process for publishing an article
___ How scholarly publication contributes to the research community
___ How to identify and paraphrase the main ideas from an article or book
___ How to synthesize information from multiple sources
___ How to use evidence to draw conclusions
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___ How to use a publication style manual to format papers or bibliographies
___ How to construct spreadsheets, charts, or graphs to display information
___ How to work collaboratively

2. How do you think the publication of an article in JPUR might influence the decisions of graduate school admissions personnel?

___ Negative Influence

___ Some influence
___ Favorable Influence

3. Would you encourage students to submit an article for publication in JPUR?

___ Yes
___ Maybe
___ No

[If yes, ask 'Why?'
If no, ask 'Why not?']

[Essay text box]

4. What other comments do you have regarding JPUR?

[Essay text box]

5. Are you willing to allow JPUR to anonymously use comments you provided in this survey to help promote the journal?

___ Yes, JPUR may use my comments.
___ No, JPUR may not use my comments

Thank you for your participation in helping us to assess the *Journal of Purdue Undergraduate Research*. Please send an email to [name] at [email address] with the Subject Line: *JPUR Follow-up* if you would like to provide any additional information about your experience or the journal, or if you would like information regarding JPUR [the following year].