

Undergraduate Research at Purdue – an Opportunity

The Need:

Results of the inaugural Gallup-Purdue index highlight the need to make undergraduate research experiences, especially those that foster strong faculty-student mentorships, as universal as possible.

These experiences:

- Aid student retention – particularly women, underrepresented minorities, and first generation college students;
- Cut time to degree by helping students clarify career goals,
- Enhance interest in graduate or professional education, and
- Develop professional skills that employers find desirable.

Purdue's Context:

Purdue offers a wide array of undergraduate research experiential learning opportunities, but these activities are dispersed and often difficult to identify. Current opportunities include:

- Informal faculty-student apprenticeships,
- Summer programs for Purdue students and/or undergraduates from other institutions (SURF, DURi, IfI),
- Grant-sponsored programs (i.e. NSF, NIH, USDA, HHMI),
- Formal academic year programs (DURi, WILKE, LSAMP)
- Course-based UREs (CASPiE, BioCASPiE)

Programs vary in:

- Duration (one summer or academic semester, full year, multi year),
- Structure and activities (informal and ad hoc to highly structured with formal instruction enhancing experiential learning),
- Goals (retention, recruitment, professional skill development, career clarification).

The Challenge

While some URE programs are funded by government agencies or foundations, grant budgets are often inadequate to support rigorous or longitudinal evaluation. Internally funded program evaluation is often limited to metrics and simple surveys. URE programs that cater to small numbers of students struggle with collecting meaningful data with small sample sizes and ad hoc undergraduate research often flies under the radar entirely. Moreover, **faculty and program managers sponsoring undergraduate research often lack detailed knowledge of research literature on best practice and Purdue lacks a common system for apprising students of research opportunities, monitoring those activities, and assessing**

their impact. Structuring effective undergraduate research experiences that meet a wide range of goals, are all available to students in a common place and format, and make use of assessments that enable meaningful cross-program evaluations are a challenge.

The Context

The Discovery Learning Research Center is a national leader in URE research. Over the past 15 years, the Center has designed, assessed, and conducted research on a wide array of URE programs with very different purposes. . DLRC research, supported by the extant research literature suggests four key factors for a successful URE – whether in the guise of a formal program, or an informal apprenticeship. These factors can be summarized as follows:

1. The URE has clearly defined goals that are communicated to all stakeholders, expectations for students are well defined, and activities are aligned with goals.
2. Students have opportunities to master skills and become part of a community.
3. Student misperceptions/preconceptions about the research environment must be identified and addressed.
4. Undergraduate researchers have a source of support that is external to their faculty mentor.

The Opportunity

The software platform on which the current DLRC URE database is built will be retired in December 2016. DLRC is in conversations with internal and external vendors to design a new system with extended capabilities. **This new system can provide the framework for a robust, campus-wide system** with the following attributes:

1. Supports the needs of the many existing and new programs and independent UREs ;
2. Fosters one-stop shopping for students and faculty interested in undergraduate research;
3. Includes tools that aid faculty, whether part of a program or offering research experiences independently, to **design experiences that align with best practice**;
4. Supports wrap-around programming that meets different objectives;
5. Enables cross-program evaluation;
6. Supports DLRC's robust URE research, while providing a rich data source for other researchers;
7. Has potential for commercialization as a tool for other campuses.