

December 2, 2013

Executive Summary: Undergraduate Research Programs

A review of 12 undergraduate research initiatives suggests these programs fall into three broad categories. The first category is driven by the goal of integrating research into the curriculum to forge connections between faculty and students and to enliven coursework. The second focuses on creating connections between local communities and the college community. The third intends to foster business and entrepreneurial opportunities for students.

In order to integrate research into the curriculum in a significant and exciting way, programs such as Student as Producer at the University of Lincoln in the United Kingdom, Centre College's recent initiatives, and Humanities Writ Large at Duke University seek to transform undergraduate learning by making students dynamic creators of content rather than simply static partners to graduate students and faculty. On a more modest scale, the Undergraduate Research Opportunity Programs at the University of Pennsylvania and Florida State University utilize select students as ambassadors and participants in research initiatives that emphasize creativity and critical thinking; both universities offer options for showcasing student projects. At the University of Texas at Austin, the goal of the Eureka database is to help students navigate and choose among the many existing research opportunities for undergraduates at the University.

Several universities have programs and initiatives that strive to use research to create connections between local communities and the college. The University of Michigan's Undergraduate Research Programs, for example, are expansive enough to encompass all the colleges and schools but the Community-Based Research Program emphasizes active student involvement in addressing social problems in Detroit. The Community Partners Center at Roger Williams University embodies the university's experiential learning principles by placing undergraduates in research projects within the larger community. The Open Learning Initiative at Carnegie Mellon and The Open Lab: A Living Laboratory at CUNY's City Tech seek to broaden the perimeters of higher education through technology and engagement with larger communities, both virtual and actual.

Traditionally technology-oriented universities such as Massachusetts Institute of Technology and Stevens Institute of Technology have programs geared specifically towards encouraging entrepreneurship and facilitating business opportunities for undergraduates. MIT has various Undergraduate Research Programs, including a "Super Urop" that targets cutting edge, especially promising undergraduate projects. Stevens's newest research programs actively encourage students to create projects that can launch their careers in entrepreneurial business and technology endeavors. Although fundamentally research-based, MIT and Stevens both have launched new initiatives to address the increased interest of investment and technology companies in their students' work.

Category 1: Curriculum Transformation and Innovation

1. Initiative's name: Student as Producer

Institution: University of Lincoln

Location: UK

General Information: "Student as Producer restates the meaning and purpose of higher education by reconnecting the core activities of universities, i.e., research and teaching, in a way that consolidates and substantiates the values of academic life. The core values of academic life are reflected in the quality of students that the University of Lincoln aims to produce. Student as Producer emphasises the role of the student as collaborators in the production of knowledge. The capacity for Student as Producer is grounded in the human attributes of creativity and desire, so that students can recognise themselves in a world of their own design."

Specific information: This is an innovative university-wide initiative to transform existing "research-informed teaching" practices at Lincoln into "research-engaged teaching" that link teaching with undergraduate research. Not only will the project seek to enhance faculty-mentored undergraduate research, it strives to place students in the role of knowledge creators and "academic collaborators" within the university. The project completed a self-assessment in 2011 (http://studentasproducer.lincoln.ac.uk/files/2010/11/Student_as_Producer_self_assessment_summary-20111.pdf) and has blogs that describe various Student as Producer examples (<http://researchengaged.blogs.lincoln.ac.uk/social-and-political-perspectives-on-tourism/>).

Website: <http://studentasproducer.lincoln.ac.uk/>

2. Institution: Centre College

Location: Danville, KY

General Information: "At Centre College we [staff, faculty, and administration] engage in a number of different high-impact teaching and learning activities with our students outside of normal classroom instruction. These produce opportunities for students that include internships, study abroad, community-based service projects, and undergraduate research experiences. Because these transformative experiences play a central role in the mission of the institution, in 2012 Centre College included the promise of experiential learning experiences in the [Centre Commitment](#).

Undergraduate research, or "mentored scholarship", is one of the several transformative opportunities that satisfy this commitment. The Undergraduate Research Committee at Centre College has recently defined undergraduate research as "an activity conducted by an undergraduate with the guidance of a faculty member that advances the knowledge of the

student and aims to make an original intellectual or creative contribution to the discipline.” The definition is inclusive, and aims to cast a wide net across the various disciplinary approaches to undergraduate research. While faculty are currently engaged in undergraduate research across the divisions and disciplines at Centre College, there are challenges which the Mellon Grant is specifically designed to address. These include the ambiguity of what “counts” as undergraduate research at Centre, as well as the relatively lower frequency of undergraduate research in the social sciences and humanities compared to the natural sciences.”

Specific information: According to its website, Centre had traditionally engaged about 1/3 of its undergraduates in research and offered an individualized, experiential learning environment with a low faculty-student ratio. In 2013, Centre received a grant from the Andrew W. Mellon foundation to expand and revise its commitment to undergraduate research. With this grant Centre seems eager to extend undergraduate research programs to socially and economically disadvantaged students, and to address some practical drawbacks to such a large commitment to undergraduate education, such as differences between disciplines, faculty involvement in such initiatives and the tenure process, compensation for faculty so that undergraduate research is not simply an “add-on”, and summer incentives. The \$600,000 grant will attempt to address these barriers in order to change the culture and implement substantive undergraduate research over the next four years. Concurrently, Centre also received a sizable grant for experiential and community-based learning programs: “Internships, undergraduate research and community-based learning have long been a part of a Centre education, but now, thanks to \$500,000 from the James Graham Brown Foundation, Centre can greatly expand and improve its unique brand of experiential education.”

Website: http://www.centre.edu/studentresearch/mellon_grant.html
http://www.centre.edu/news/2013/brown_funding.html

3. Initiative’s name: Humanities Writ Large

Institution: Duke University

Location: Durham, NC

General Information: “Humanities Writ Large aims to infuse the undergraduate experience with opportunities to conduct humanities research and thereby learn how humanities fields contribute valuable new knowledge through humanistic analysis, perspective and methods. This is a provocative challenge to the traditional paradigm that research needs to be restricted to faculty and graduate students experts, and also supports Duke’s broader goal of increasing undergraduate research in all fields. Our belief is that early exposure to humanistic research and analysis helps students become more thoughtful architects of their own education and more sophisticated consumers of the humanities throughout their lives.”

Specific information: Although this is a specifically humanities-focused research initiative, it is

part of “a larger Trinity College of Arts & Sciences (TCAS) effort to strengthen the culture of undergraduate research by funding initiatives to increase the number of Duke students engaged in faculty mentored research that leads to graduation with distinction projects.” Moreover, in Fall 2013 a research initiative specifically for entering freshmen in Biology, “[Project Search](#) ... [a] two-week program designed to provide research opportunities to students who have not had substantial lab experiences prior to admission” included humanities for the first time. “Students in the humanities track in P Search lived and socialized with students in the original biology sequence.” Also, The Humanities Writ Large Steering Committee specifically states that it wants collaborative, innovative, project-based proposals.

Website: <http://humanitieswritlarge.duke.edu/undergraduate-research>

4. Initiative’s name: Penn Humanities Forum

Institution: University of Pennsylvania

Location: Philadelphia, PA

General Information: “Penn undergraduate students have the opportunity to participate in the Penn Humanities Forum through the Andrew W. Mellon Undergraduate Research Fellowship program and occasional partnerships with other Penn programs. As the Forum's main undergraduate initiative, these research fellowships cultivate the importance of humanistic thought across all disciplines. The competition is open to any full-time student enrolled in any Penn undergraduate school who is interested in conducting research on some aspect of the Forum's annual theme.”

Specific information: There are only a total of 13 fellowships awarded, in amounts of \$2000, \$1750, and \$1500. The projects that have been funded seem scholarly and critically excellent, but conservative and traditional in execution. The amount of interaction with faculty is not immediately apparent from the website, but an interesting aspect of this program is that funded fellows also work together on the Undergraduate Humanities Forum committee which seems to be part of the university-wide Penn Humanities Forum initiative (<http://humanities.sas.upenn.edu/index.shtml>) so it seems that there would be ample opportunity to work closely with faculty and staff, graduate students, and others in the community. The committee work is in addition to the research project.

Website: <http://www.phf.upenn.edu/uhf.shtml>

5. Initiative’s name: OUR (the Office of Undergraduate Research)

Institution: Florida State University

Location: Tallahassee, Florida

General Information: “The Undergraduate Research Opportunity Program (UROP) offers a rare opportunity for first- and second-year students to partner with our excellent faculty as research assistants. Students in UROP work closely with faculty and peers, receive mentorship and training in the UROP Colloquium class, and present their contributions in the Spring Research Symposium. After a highly successful first year, the second year of UROP will begin in fall 2013, and is open to students of all majors.”

Specific information: This program looks like it is open to all majors across the university, and includes an option for creative projects. Creativity is rhetorically stitched to research in a number of ways across the promotional materials for the initiative. It is a new program, but student examples show breadth and promise (<http://our.fsu.edu/posters.html>). They have a student council comprised of students from several different majors who are tagged “ambassadors” of the program, an online, peer-reviewed, undergraduate journal that showcases student research articles (<http://diginole.lib.fsu.edu/owl/>), and a symposium in the spring to highlight the projects. Not only, then, do students engage in research, but it seems there are support systems built in double as practical, real world, experiences that students can put on their resumes and in their portfolios.

Website: our.fsu.edu

Twitter: [@FSU_OUR](https://twitter.com/FSU_OUR)

6. Initiative’s name: Eureka

Institution: University of Texas at Austin

Location: Austin, TX

General Information: “Every undergraduate at the University of Texas at Austin has the opportunity to become a researcher and take part in the vibrant intellectual work of the university. Here in the Office of Undergraduate Research, we offer advising and other resources to help you participate in research that is happening across campus. You may want to be a scientist and participate in laboratory research, you may want to dig through historical archives or archaeological sites, or you may want to interview subjects for a sociological study. All of this—and so much more—is research, and you can get involved.”

Specific information: It looks like Eureka is a response to the rather daunting and generic information available from the Office of Undergrad Research ([Undergrad Research @OUR_UTAustin](http://UndergradResearch@OUR_UTAustin)). It seems clear that a vast amount of possibilities for undergraduate research exist, and the projects showcased seem various and interesting. The idea of having a searchable database for a large, prestigious, public research university is a good one, but the execution of the website design remains circular (links are redundant) and the sheer variety of

support services seems a bit daunting. There are numerous links to informational sessions, however, and the Eureka site has an Ask an Advisor function that likely provides more directed information for students. It seems that Eureka is a response to UT's existing initiatives.

Website: <https://www.utexas.edu/research/eureka/>

Twitter: @OUR_UTAustin

Category 2: Community and College Connections

7. Initiative's name: UROP UMich

Institution: University of Michigan

Location: Ann Arbor, MI

General Information: "The Undergraduate Research Opportunity Program (UROP) creates research partnerships between first and second year students, and faculty, research scientist, and staff from across the University of Michigan community. All schools and colleges are active participants in UROP, thereby providing a wealth of research topics from which a student can choose. Begun in 1988 with 14 student/faculty partnerships, today, approximately 1300 students and over 700 faculty researchers are engaged in research partnerships."

Specific information: This UROP is exemplary in that it is a university-wide program, with different schools and programs operating somewhat independently. For example, the Detroit Community Based Research Program pairs students who are interested in "social justice and community action for social change" with a community program based in Detroit over the summer. These are paid, full-time internships. Two of the three stated "priorities" for Victors for Michigan, a new campaign for UMich emphasize research. The research emphasis is explicitly paired with entrepreneurship, solving future challenges, and community service. Although not radically altering the curricula of existing schools and colleges at Michigan, this UROP implementation seems significant in its breadth and the university's commitment to research-based undergraduate education seems significant.

Website: <http://www.lsa.umich.edu/urop/>

8. Initiative's name: Community Partners Center

Institution: Roger Williams University

Location: Bristol, RI

General Information: “The Roger Williams University (RWU) Community Partnerships Center (CPC) provides project-based assistance to nonprofit organizations, municipalities, government agencies and low and moderate income communities in Rhode Island and Southeastern Massachusetts. Our mission is to undertake and complete projects that will benefit the local community, while providing RWU students with experience in real-world projects that deepen their academic experiences.”

“Community partnerships broaden and deepen the academic experiences of RWU students by allowing them to work on real-world projects, through curriculum-based and service learning opportunities, collaborating with nonprofit and community leaders as they seek to achieve their missions. The services provided by the CPC would normally not be available to these organizations due to their cost and or diverse needs.

Specific information: The entire university is focused on project-based, experiential learning. There are several initiatives, particularly some excellent ones for undergraduate research in Marine Biology, but the Community Partners program draws from across academic disciplines and provides research opportunities combined with practical experience--also bridges academic, professional, and community-based cultures.

Website: <http://rwu.edu/about/partnerships-initiatives/cpc>

9. Open Learning Initiative at Carnegie Mellon

General Information: “The Open Learning Initiative (OLI) is a grant-funded group at Carnegie Mellon University, offering innovative online courses to anyone who wants to learn or teach. Our aim is to create high-quality courses and contribute original research to improve learning and transform higher education.”

Specific Information: The OLI offers open source, free courses and course platforms to interested students, teachers, and institutions.

Website: <http://oli.cmu.edu/the-herb-simon-connection/>

10. Open Lab: A Living Laboratory at City Tech

General Information: “ ‘A Living Laboratory: Revitalizing General Education for a 21st-Century College of Technology’ is a five-year initiative (2010-2015) funded by the U.S. Department of Education’s Strengthening Hispanic-Serving Institutions (Title V) program. Its mission is to re-envision General Education at City Tech as a ‘living laboratory,’ using City Tech’s signature strengths: hands-on experiential models of learning and our vibrant Brooklyn Waterfront location.

Specific Information: The Open Lab seeks to develop open-source digital teaching platform, enhance the general education curriculum at City Tech through experiential learning, and create

an endowment for student and faculty research.

Website: <http://openlab.citytech.cuny.edu/livinglab/>

Category 3: Encouraging Entrepreneurship and Creating Business Opportunities

11. Initiative's name: MIT's Undergraduate Research Opportunities Program (UROP)

Institution: MIT

Location: Cambridge, MA

General Information: "MIT's Undergraduate Research Opportunities Program (UROP) cultivates and supports research partnerships between [MIT undergraduates and faculty](#). UROP offers the chance to work on cutting edge research—whether you join established research projects or pursue your own ideas."

Specific information: Since MIT has always been research-and technology-based, it seems fitting that this was one of the first UROP programs. Most programs seem to be faculty and department-funded, although the program offers some funding. There also seem to be several options and levels of engagement for students to choose from. There was a SuperUrop launched last year that seems to be an elite version of the UROP.

Website: <http://web.mit.edu/urop/>

12. Institution: Stevens Institute of Technology

Location: Hoboken, NJ

General Information: "The Office of Research centers itself around academic research, national research centers, and cross-cutting research initiatives, along with supporting organizations and infrastructure. Creative and entrepreneurial research is an integral part of the Stevens mission. Building Communities for Research in focused areas has been a top priority of the Office of the Provost. Such communities are bound by a common purpose to achieve something distinct, to cross over department and school boundaries, and are the cornerstone of the extended research enterprise, which is supported as a top institutional priority. The fundamental principles governing the research environment at Stevens are Inventiveness, Creativity, and Entrepreneurship (ICE). The learning environment created at Stevens involves students, faculty, and colleagues from government and industry, who all work together from invention to market realization of technology. The Office of Research provides incentives, support, and encouragement in building and sustaining cross-disciplinary clusters within such communities."

Specific information: Stevens is focused specifically on science, technology, business, and

entrepreneurship. It was conceived of as a collaborative institution so research has been a hallmark of student and faculty interactions over the years. However, recently the office of the provost has launched a research initiative that seems more focused on producing “intellectual property” and as such is actively inter-and-multi-disciplinary, as well as community and project-based. Students seem particularly encouraged to think about becoming successful in launching their own start-up companies. Specifically, Stevens has started an Office of Innovation and Entrepreneurship that “ seeks to redefine the traditional university-industry technology transfer process by creating an unconventional entrepreneurial solution -- the Academic-Innovation-Transfer process. The key to success is the establishment of an open system in which competent partners with diverse backgrounds combine their complementary expertise to create technological innovations that lead to successful technology transfer ventures.” This office was established from a perceived failure, at the university level, to teach students how their knowledge could work for them and for technology initiatives outside of the classroom setting. As such, Stevens is attempting to change its traditional learning model to be more industry and business friendly: “OIE addresses the need to radically change the process of technology commercialization in a university environment. The creation of the OIE is a timely response to inefficient technology transfer processes with which modern universities struggle. The OIE aims to foster and exploit technology-driven innovations that either are adopted by industry or serve as a basis for creating new ventures. With the implementation of a culture of Innovation and Entrepreneurship (I&E), Stevens Institute of Technology recognizes the new role that universities are playing in response to pressures - both internal and external - to create wealth through the exploitation of scientific discoveries and technological innovations. In that respect I&E represents a paradigm shift in technology transfer.”

Website: <http://www.stevens.edu/provost/research/index.php>

Links to CUNY Initiatives and Conferences:

[CUNY's Science Undergraduate Research Program](#) is a summer research program for undergraduates interested in research careers in the sciences or engineering.

[CUNY's Pipeline Program](#) supports underrepresented CUNY undergraduates interested in pursuing advanced degrees.

The [Sigma Xi Grants-in-Aid of Research \(GIAR\) program](#) provides grants for undergraduates to conduct research in close collaboration with faculty.

5th Annual York College Undergraduate Research Day:

<https://www.york.cuny.edu/academics/undergraduate-research>

CSI Undergraduate Conference on Research, Scholarship, and Performance:

<http://www.csi.cuny.edu/ugconference/>

General Resources

The [Council on Undergraduate Research \(CUR\)](#) hosts the [Registry of Undergraduate Researchers](#), designed to connect undergraduates with research experience and an interest in

an advanced degree with graduate schools looking for well prepared student.

The [National Conferences on Undergraduate Research](#), a national venue for undergraduate researchers to share their research and network with peers and faculty.

[NSF's Research Experiences for Undergraduates \(REU\) program](#) funds projects involving students, in any of the areas the NSF supports; [students interested in participating in research at an REU site should contact REU sites directly](#).

<http://cgi.stanford.edu/~dept-ctl/tomprof/posting.php?ID=1041>

<http://ellipsis.mooreworks.net/cms/>