



U.S. Senate  
*Hearing: Driving Innovation through Federal Investments*  
Committee on Appropriations  
April 29, 2014

Testimony Submitted by

**Council on Undergraduate Research**  
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Chairwoman Mikulski, Ranking Member Shelby, and members of the committee: for more than 35 years, the Council on Undergraduate Research (CUR) has provided leadership, programs, services, and advocacy for the international undergraduate research community. The organization's mission is to expand and enhance high-quality faculty-mentored student research at the undergraduate level. In fulfilling that mission and serving its 10,000 and close to 700 academic institutional members, CUR is uniquely qualified to offer testimony of the value of federal investments in basic and applied research, as well as research training support, in preparing the nation's workforce to be resilient, entrepreneurial, and innovative.

#### **Undergraduate Research: A Proven Way to Build College Student Success and Drive Innovation**

Higher education has never been more important, both for individual advancement, and for the economy, yet we keep hearing the same stories: students are not able to progress to the finish line to get their degrees, or worse yet, graduate with a degree that doesn't seem to provide the type of professional preparation sought by employers.

Is there an existing strategy that is already proven, already popular, already documented to build resilience, innovative and critical thinking, problem solving and communication skills, and lead to increases in degree attainment for undergraduate students? Couldn't we successfully expand that strategy throughout higher education through increased investments at the federal level? **The answers are YES, and ABSOLUTELY.**

Undergraduate research has been cited by numerous national reports and experts, including the President's Council of Advisors on Science and Technology, as a powerful strategy for increasing student retention in degree programs and boosting student graduation rates, particularly for students who sometimes struggle in higher education.

Undergraduate research is an effective practice that supports multiple national policy goals for several reasons: (1) it increases students' level of professional aspiration, (2) it builds core competencies in the skills valued in the workplace, and (3) it connects students with mentors.

*Increased aspirations:* One of the main results of undergraduate research, and one that is documented by many studies, is that undergraduate research experience elevates students' goals. Most commonly, if a student aspired to complete a bachelor's degree prior to an undergraduate research experience, after that experience, s/he aspires to complete a graduate degree. There is evidence that these "reset" aspirations lead to action, which is one of the main reasons federally-funded programs such as the National Science Foundation's (NSF) and Department of Defense (DoD) Research Experiences for Undergraduates (REU) and the Louis Stokes Alliance for Minority Participation (LSAMP), as well as the Department of Education (ED) Ronald McNair Post-Baccalaureate Scholars program integrate undergraduate research as the cornerstone activity.

*Core professional competencies:* In addition to raising students' ambitions, undergraduate research builds specific competencies in skills and content associated with specific disciplinary research, as well as general competencies in analytical thinking, oral and written communications, and team work—the very skills that are top of mind when policymakers discuss federal education goals.

*Mentorship/Learning Communities:* Undergraduate research builds relationships with faculty mentors, as well as other students (including graduate students). For example, mentorship has been demonstrated to be an important factor in African-American students' perceptions of success in undergraduate research. In addition, the opportunity undergraduate research affords students to build their professional resumes through presentations at regional and national meetings, as well as via publications, assists in professionalizing the student learning experience, and presenting concrete evidence of student achievement.

Undergraduate research and other high impact practices (Brownell and Swaner, 2010) have a particularly salutary effect on the achievements of students underrepresented in higher education. There is evidence that early (e.g. first college year) introductions of these strategies are very important. A seminal publication on the positive outcomes afforded by early undergraduate research experiences is the work by Nagda et al., 1998, analyzing the successes of undergraduate research students participating in the University of Michigan Undergraduate Research Opportunities Program (UROP). Their findings, which have been recapitulated in a variety of settings, are that disproportionately positive benefits accrue to students from underrepresented groups.

### **Growing Support for Undergraduate Research Outside Academe**

Increasingly, voices expressing support for undergraduate research are coming from outside of academe. Business, industry, and governmental entities (including defense) are sectors that are increasingly engaged in directing undergraduate education pathways, particularly in the STEM (Science, Technology, Engineering, and Mathematics) disciplines. Nations vigorously compete and strive to take full advantage of a complex, globally-interconnected economy fueled by bringing research rapidly to market. In this emerging context, undergraduate research has now been officially "discovered", and touted as a critical element in individual, institutional, and national achievement.

**Innovation** is clearly at the heart of economic competitiveness, and it is also fundamental to the practice of undergraduate research. The most recent survey of employers conducted by the American Association of Colleges and Universities (Hart Research Associates, 2013) revealed that of all the skills

valued by employers, the ability of graduates to innovate is the most highly prized. In the United States, two recent reports from the President's Advisory Council on Science and Technology (PCAST, 2011; 2012) highlight the importance of undergraduate research, and tie it to the nation's economic competitiveness. Although much of the emphasis in the PCAST reports is on STEM disciplines, the advice applies to most undergraduate degrees. The U.S. Business and Higher Education Forum similarly has identified undergraduate research as a major capacity-building strategy for improving undergraduate education (BHEF, 2013).

### **Needed Now: Sustained Federal Investments to Expand Undergraduate Research**

This generation of college students is facing head winds. Limits in their opportunities for affordable, quality education. An economy that is still in recovery mode and which is also rapidly changing. Through expansion of federal funding for undergraduate research, we give our sons and daughters – the future U.S. workforce -- the critical edge they need to persevere, succeed, and go on to the success they deserve. *Delay is not an option.*

The federal investment in undergraduate research relies on funding for the federal agencies that support research. In recent years, as federal policymakers strive to support policies, programs and practices that support innovations and interest and success in the STEM fields, CUR has argued that support for undergraduate research should be included in any policy change and should receive sufficient public dollars to meet the country's need: an expanded pool of research-trained undergraduates ready to take on the economic and societal challenges the country faces.

As members of the Senate Appropriations Committee consider how to foster innovation, CUR and its members urge you to sufficiently fund investments in research across the federal government. In particular, we ask you to invest in undergraduate research programs at NSF and the National Institutes of Health (NIH). At NSF, the Research Experiences for Undergraduates program is crucial to the endeavor on campuses nationwide, and an increased level of support would benefit students, campuses and the country. Further, since the students that would benefit the most from undergraduate research experiences are often the very students who get to campuses after many struggles and need multiple supports to stay there, the most successful undergraduate research programs are inextricably linked with the McNair Scholars program administered by ED. We ask you to ensure that the McNair program is adequately funded and not undermined by efforts to serve students differently via the Upward Bound program also administered by ED.

In addition, we ask you consider changes to the programs authorized by the America COMPETES Act that would explicitly cite undergraduate research as a practice that should be supported at the agencies affected by the statute. Senator Amy Klobuchar (D-MN) had introduced legislation, the Innovate America Act (S 1777) that recognizes the benefits of undergraduate research and we support its enactment and consideration as the process to reauthorize America COMPETES progresses. (Senator Klobuchar is being honored with the 2014 Honorary CUR Fellow Award in recognition of her support for undergraduate research and policies that supports its growth.)

### **Conclusion**

As you are faced with difficult choices in how to allocate federal dollars and the task of developing and implementing policies that nurture success among the country's youth and preserve its innovative spirit, know that undergraduate research is a practice that meets multiple policy goals and its growth will benefit young people, academe, the research enterprise, the economy and the country. CUR and its members look forward to working with you and your staff as you develop policies to this end.

## About the Council on Undergraduate Research

*For more than 35 years, the Council on Undergraduate Research (CUR) has provided leadership, programs, services, and advocacy for the international undergraduate research community. The organization's mission is to expand and enhance high-quality faculty-mentored student research at the undergraduate level. In 2011, CUR merged with the National Conferences on Undergraduate Research (NCUR). NCUR is a showcase of undergraduate research productivity, drawing more than 4000 participants yearly. At more than 10,000 members strong, and with close to 700 academic institutional members, CUR is uniquely qualified to offer testimony of the value of federal investments in basic and applied research, as well as research training support, in preparing the nation's workforce to be resilient, entrepreneurial, and innovative. More information is available at [www.cur.org](http://www.cur.org).*

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