



OFFICE OF UNDERGRADUATE
RESEARCH
SUMMARY REPORT
2014-2015



Dr. Peter J Civetta

DIRECTOR

21 July 2015

OFFICE OF UNDERGRADUATE RESEARCH ADVISORY COUNCIL 2014-15

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PART ONE: OFFICE OF UNDERGRADUATE RESEARCH FORMATION AND GOALS

Undergraduate research is a high-impact activity that yields significant cognitive, academic, and personal growth for students. It challenges them to think and collaborate in new ways, to add meaningful knowledge to the world, and to raise the bar of their own expectation. Undergraduate research at Northwestern is based upon the four pillars of the University's Strategic Plan (Connect, Engage, Discover, Integrate). Connecting and Engaging are the processes of "problem finding;" before you can solve a problem, it must first be identified, confirmed, studied, and approached with a feasible plan. It is where personal passion meets humanitarianism/civic engagement and literature review. Undergraduate research requires students to identify what is known in order to discern what still needs to be done (and why). It also requires developing relationships with new international and domestic partners in its effort to further the goals of diversity and inclusion by valuing the voices of all people and seeking to help them develop further. Discovering and Integrating are where thoughts and ideas become action. It is where data are acquired and analyzed in order to produce new knowledge. In addition to building practical competence in important skills, undergraduate research, more importantly, teaches the critical thinking process involved in approaching and seeking to solve the world's problems, knowledge that is easily repurposed in new situations again and again in whatever field the student pursues post-graduation. Integration is not only about analyzing results, but it is also about learning the crucial communication skills that allow ideas to flourish. Through the Undergraduate Research and Arts Exposition, Northwestern seeks to teach students how to communicate effectively to disparate audiences, often leading to professional conference presentations and prestigious fellowships and awards. Through the process of Connecting, Engaging, Discovering, and Integrating, undergraduate research fosters intellectual adaptability, creative ideation, perseverance, and teamwork/collaboration through direct, relevant, sustained mentoring by dedicated faculty. It is Northwestern's goal to help all interested students to achieve these goals.

Therefore, in the fall of 2012, the Office of the Provost formed the Office of Undergraduate Research (OUR) under the auspices of the Associate Provost for Undergraduate Education. The mission of the office was to create and facilitate more and better research experiences for undergraduates through the running of various programs, coordinating with schools, departments and other units also supporting undergraduate research, and communicating with and advising students throughout the process. Building upon existing programs, a priority of the OUR has been to specifically help lead students to undertake independent research projects, believing that these experiences help them to fully synthesize their Northwestern education and more fully prepare them for experiences solving problems in post-undergraduate worlds. For example, an analysis of recent Fulbright winner data (2013-14) revealed that obtaining a grant from the Office of Undergraduate Research was more highly correlated with winning a fellowship than any other factor outside of a student receiving honors (which often comes from the project for which the student was granted funding from the OUR). Northwestern has been committed to supporting the mission of the new OUR, allowing the number of students funded to triple in the first six years since the current director was hired. **{Figure 1}**

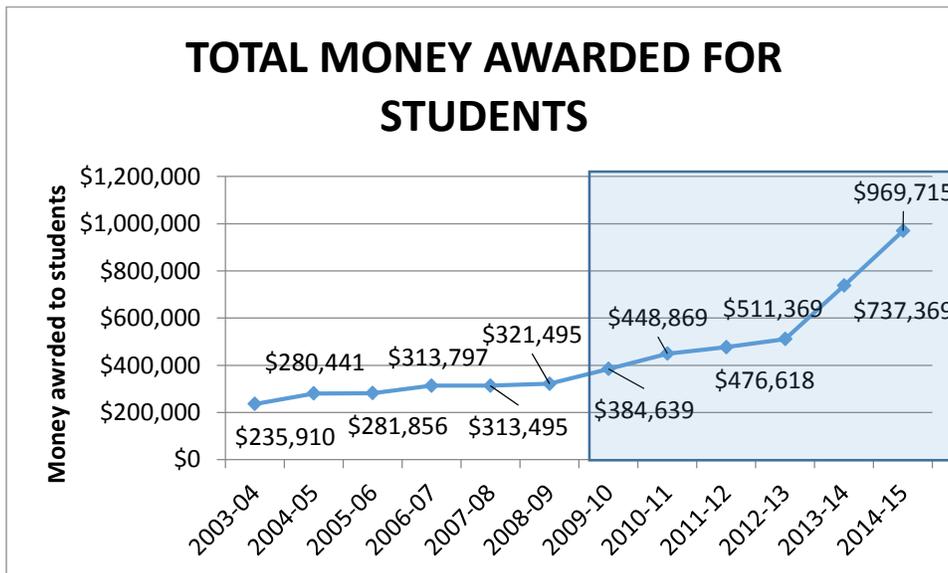
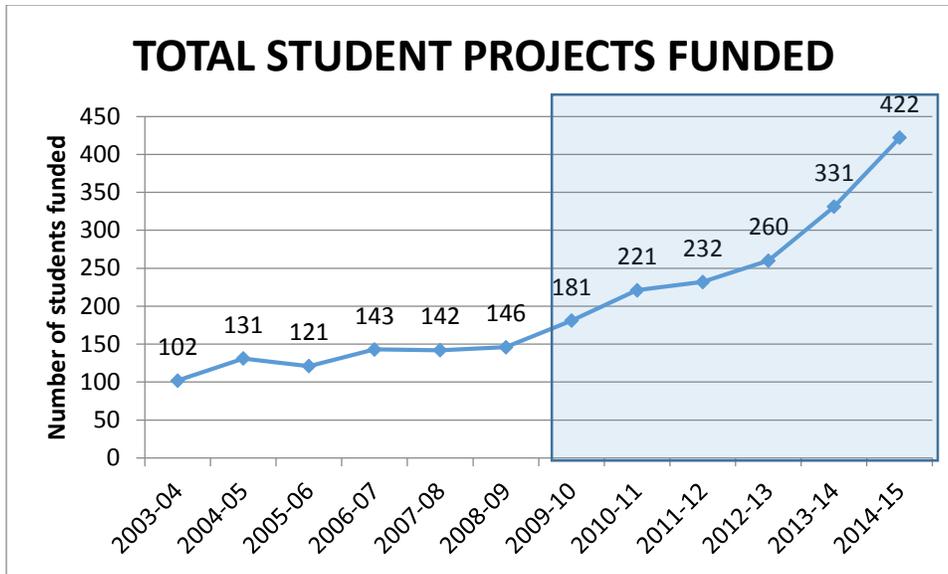


Figure 1: The top panel shows the number of students awarded grants. The bottom panel shows the amount of money awarded over that same time period. NOTE: The shaded blue area indicates the time period covered by the current director.

The sharp increase in the past two years can be attributed to the creation and expansion of a new research assistant pilot (funding for faculty to hire students to work on their research projects) and the increase in advising and outreach for the URG program, explained more fully below. In 2014-15, programs administered by the Office of Undergraduate Research received 801 student applications. 422 were awarded at an investment of almost \$1,000,000.

In addition, one of the first tasks undertaken by the new Office of Undergraduate Research was the formation of an Undergraduate Research Collaboration Group with representatives from all major entities on campus that fund and/or facilitate undergraduate research experiences. The group first surveyed programs across the University and then created mechanisms for clearer communication

channels around funding decisions. They also worked to streamline processes for students, administrators, and faculty alike through the creation of common budget and proposal expectation documents.

One of the great challenges of creating undergraduate research experiences is that there is not one path that works for all. Disciplines operate very differently, and expectations and ways to get involved and move towards the completion of independent projects can vary. At its core, the primary distinction is between the lab and field-based disciplines and non-lab and non-field-based disciplines, which can also be understood as research group and non-research group projects. Lab, research group, and field-based sciences are collaborative in nature, as reflected in the common-practice across natural science disciplines of multiple authored publications. Undergraduates, graduate students, post-docs and faculty researchers work in mentor-mentee relationships throughout their careers, frequently in collaboration with teams of lab-technicians. Undergraduates beginning research in these disciplines must learn how to conceptualize and carry-out an independent project that is, at the same time, a contribution to a larger collaborative project. For faculty, non-lab and non-field based research is often more self-directed, while arising out of on-going disciplinary trajectories. These disciplines are almost exclusively governed by sole authored publications, and undergraduates beginning research in these disciplines must learn first how to conceive and create a project based upon deep knowledge of the literature along with gaining the necessary methodological experiences to allow them to successfully complete the project. Therefore, what is “self-directed” for faculty is in practice “self-motivated” for undergraduates. Students seek out topics and interests that are compelling to them, but they require significant mentoring and oversight by faculty since the research experience is entirely unfamiliar. In line with the University’s Strategic Plan, the OUR believes that at the heart of undergraduate research lie faculty who are willing to mentor and advise students. For students to have truly impactful experiences, they need to learn how research works in their discipline specifically through meaningful and sustained guidance and support from faculty. For the purposes of this report, all lab, research group and field-based research will be shortened to “lab,” and all non-lab, non-research group, and all non-field-based research will be shortened to “non-lab.”

One strength of the lab world is that it provides significant support and opportunities for students. Labs are based upon a collaborative working model that allows undergraduates to come in with little to no experience and immediately join a team that will provide training and guidance. Labs invest significant amounts of resources (both time and money) supporting undergraduates, particularly in terms of the often expensive consumables used in their projects. Prior to the formation of the OUR, the infrastructure already existed in this world, including potential funding from various governmental programs like the NSF and NIH. Student experiences have been impressive, leading to senior theses, major fellowships, acceptance into top level graduate programs, and jobs with industry leaders. Given the collaborative model in these fields, students often receive publication credit for their work, regularly serving as first author in these fields where almost all publications are jointly authored. Challenges in this area for the Office of Undergraduate Research include learning to navigate the complex and often idiosyncratic lab world, engaging with faculty directly around opportunities both internal and external to the lab, and fostering and developing a culture that can lead to independent projects within a lab environment.

Non-lab research is almost entirely self-motivated and independently done, although it requires engaged faculty mentorship since students are not used to the processes or challenges inherent to

research. This approach allows students to fully develop and follow passions and interests, engaging directly with topics of personal relevance. However, unlike lab experiences, there is no established infrastructure to offer guidance and assistance, and students are frequently unaware of the importance of faculty mentoring through this process. While there are excellent thesis seminars across campus, these opportunities appear for students late in their careers and reach a limited population depending on normative practices within majors. Therefore, the OUR's primary initial goals have been to develop support and resources to help these types of students, particularly in two areas. First, in many fields, students are not even aware how research operates, as they only interface with their faculty via coursework largely unrelated to that faculty's research interests. By comparison, science courses often contain lab components that mimic how research is undertaken and indicate a clear path for getting involved. Therefore, students need to be shown what research looks like in their fields. Second, students don't have a clear path for how to get started both thinking about a research project and further developing it. While faculty provide exactly this type of resource, students in these fields either are unaware that it is appropriate to reach out to faculty in this way and/or they are unsure how to do so, having only previously reached out to discuss classwork. Therefore, the OUR facilitates access to faculty and to resources that help students learn how to get started, how to develop their projects, and ultimately how to see a project through to completion.

The core mission of the Office of Undergraduate Research centers on advising, seeking to create a relentlessly positive environment for students from every major. The advising focuses on meeting students where they are, helping them discern their goals, and then working with them towards their achievement. The process seeks to develop student passion and initiative, and it is fundamentally based upon collaboration with faculty with expertise in the area of study. The OUR provides two distinct types of advising. First, OUR advisors meet with students at any time to talk about their interests and goals, seeking to help them develop their ideas and directing them to available resources. In helping them to connect with relevant faculty, OUR advisors teach them how to first discern who will be best able to assist them and then how to compose appropriate correspondence. Second, OUR advisors meet with students applying to any grant programs run by OUR, helping them first think through their projects and ultimately teaching students how to write research grant proposals. The advising also focuses on directing students to relevant faculty in their field. While OUR advisors offer general counsel on project development, the OUR relies on faculty to offer disciplinary specific assistance with, in particular, reviewing relevant literature and developing an appropriate methodology for the project. OUR advising is not designed to supplant that crucial faculty-student relationship; rather, the service offered is viewed as supplemental, helping students get started and relieving some of the demand on faculty time in the process. In the most recent Summer URG competition, OUR advisors (director, assistant director, and half-time advisor) met with well over 250 individual students for a total over almost 600 separate meetings (up 7.5% over the previous year). The majority of these students were from non-lab disciplines.

With these goals and challenges outlined, this report will discuss in more detail programs, approaches, and challenges specific to the two types of research engagement (lab and non-lab) and outline current results, assessment, and future aspirations.

PART TWO: UNDERGRADUATE RESEARCH IN NON-LAB SETTINGS

In order to address the core need to create an infrastructure and support system for students interested in getting involved in research in non-lab settings, the Office of Undergraduate Research implemented the following initiatives:

- **Development of Comprehensive Web Site:** Prior to 2009 (the hiring date of the current director of the office), there was no unified and comprehensive web presence for undergraduate research, only isolated grant program pages hosted by different offices/departments across the University. Revamped in 2014 with significant input from students, the current web site offers a road map and resources to help students get started. <https://undergradresearch.northwestern.edu/>
- **Creation of Undergrad ARCH/Global and Research Opportunities Database:** Working with NUAMPS, the OUR created a searchable database of research opportunities; it was recently updated and merged with international opportunities to create a one-stop, responsively designed, comprehensive database to help students discover available research opportunities and programs. <http://globalresearchopportunities.northwestern.edu/>
- **Integration of Northwestern Scholars:** OUR has worked to obtain access for undergraduates to the Northwestern Scholars database. This key tool helps them to search for faculty according to their research expertise, ultimately enabling students to find relevant help for the development and completion of their projects. <http://www.scholars.northwestern.edu/>
- **Created Research Workshops:** OUR created a series of workshops designed to teach students from non-lab disciplines what research looks like in various fields through student testimonials, faculty talks, and office-led discussions on how to begin developing their own independent projects. The workshops were filmed and placed online. The success of these web videos led the director to obtain funding from the Arthur Vining Davis Foundations to expand the disciplinary video series and create a 7-episode web series called “The Adventures of Grant Man” which shows the steps involved in developing independent research projects. The 40 videos are housed on a YouTube page that have received over 7,000 views. The director has given two talks to national organizations on the video resources, and they are considered the leading edge of efforts to get more students from independent disciplines involved in research. <https://www.youtube.com/user/OURNU>
- **New Program Development:** Aware of the discrepancy, at both a national and university-level, between funding opportunities in the humanities and social sciences versus the natural sciences, the OUR created the Undergraduate Research Assistant Program. URAP allows faculty to apply for funding to hire students to work on their research projects in exchange for one-on-one mentoring and a significant role in the research process. While open to all faculty, the program’s stated goals focus on underfunded areas where there are no other options for funding to hire students (humanities, arts, and other non-lab based disciplines) and on students just getting started in research. In 2014-15, URAP funded 49 of 58 faculty applications from non-lab and field-based disciplines as opposed to 31 of 44 of lab faculty applications, indicating that both in terms of raw numbers and success rate the program is hitting its target of creating more opportunities for non-lab and field-based research experiences. **[Figure 2]**

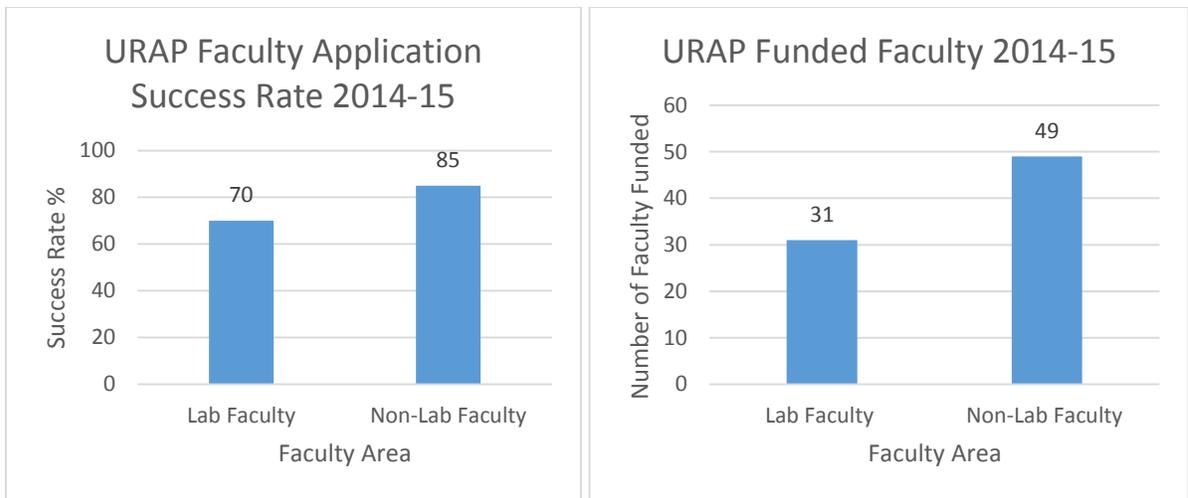


Figure 2: The left panel compares the success rate of faculty applying for URAP funding from lab and non-lab disciplines. The right panel compares the number of faculty awarded funding from lab and non-lab disciplines.

Recent funded projects have included art installations, playwriting, historical archival work, and assessing community/identity at Northwestern among many others.

- **Reconfigure Language Program:** OUR has shifted the focus of the Undergraduate Language Grant from simply funding students who attend intensive summer language programs to recruiting those with the specific goals of using that language for future research experiences. Recognizing that the lack of language skills creates a barrier to conducting research in some non-lab disciplines, the program seeks to facilitate students’ ability to prepare appropriately.
- **Redefine URG Expectations:** The Undergraduate Research Grant program already funded students across all disciplines, but to ensure funding decisions were equitable, OUR instituted the following changes:
 - Restated and emphasized the existing commitment that the review committee would fund as many grants as they felt were worthy. Students are denied grants only if the committee feels there are substantive problems with the project or proposal.
 - Expanded the committee to cover more disciplines to ensure the reviewers’ decisions were based on accurate, discipline-specific expectations. This move was particularly necessary in fields such as journalism and the arts that were sometimes judged by social science standards.
 - Emphasized “revise and resubmit,” allowing students who are new to project development and proposal writing another chance to address specifically named concerns by the committee. If their proposal is declined, students are given specific feedback from the URG Committee. For Academic Year grants, students are encouraged to meet with their faculty sponsor and OUR advisors to help them re-conceptualize and/or re-write their proposal to address the committee’s feedback and to re-apply at next deadline (5 per year, usually about 3 weeks after decisions are announced). Over 70% of the students who used the revise and resubmit opportunity ultimately received funding for their project. **[Figure 3]**

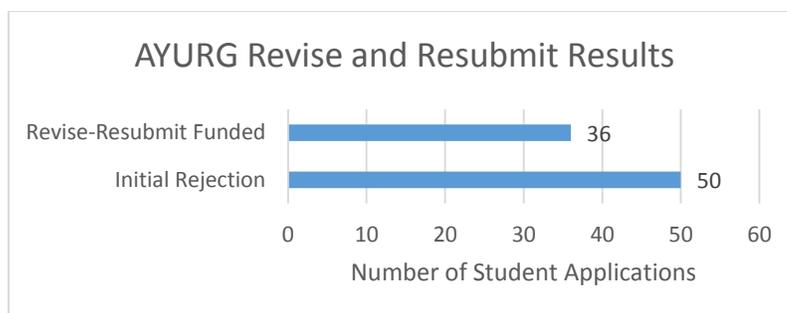


Figure 3: From 2010-2014, 50 students whose AYURG proposals were rejected took advantage of the revise and resubmit opportunity, and 36 were awarded funding (72%).

For summer grants, students use the committee’s feedback to apply to their school or departmental programs after conferring with their faculty sponsor. While there are not opportunities in all fields, WCAS, Communications, and McCormick have all adjusted their deadlines through the Collaboration Group to leverage the feedback of the URG Committee.

- Created a training handbook for all committee members and held annual meetings to keep expectations uniform across disciplines.
- Defined proposal/project expectations across disciplines. All proposals, regardless of discipline, must demonstrate a clear research need for the project within the discipline (background and literature review), must have a detailed and defined methodology including a plan for analysis (knowing that it will likely change in practice), and must demonstrate that the candidate has the required abilities and preparation to complete the project (has the requisite skills outlined by the methodology).
- **Expansion of Post-Research Opportunities:** Realizing that conducting research is not the final step in the process, the OUR has expanded on opportunities and training for the communication of research findings.
 - **Undergraduate Research and Arts Exposition:** OUR runs the largest annual conference for students across the University. A key component of the event is to provide specific training workshops to help students learn how to prepare a poster or to give a research talk. OUR has also added a Creative Arts Festival to showcase creative projects for students studying music, theater, dance, and creative writing.
 - **Conference Travel Grants:** OUR provides funding for students selected to present their research at national and international conferences. Students can use the funding as often as they get accepted to present.
 - **CAURS:** The OUR Director serves as faculty sponsor of Chicago Area Undergraduate Research and Arts Exposition, which is run by students from seven area institutions, and provides another avenue for research presentations.
 - **NURJ:** OUR collaborates with Northwestern Undergraduate Research Journal to create opportunities for students to get their work published.

These efforts have led to increases in the volume and success of students across non-lab disciplines, but the OUR is aware that more is left to be done, including the following:

- **Better coordination with departmental programs:** The OUR understands the importance of doing a better job reaching out to learn how various departments are promoting undergraduate research and discern better ways of collaborating. Senior thesis and research methods seminars are a particular area of interest.
- **Better outreach with faculty:** OUR needs to find additional ways to reach out to faculty to let them know about programs (URAP, URG, Expo, etc.) and programmatic expectations, particularly with URGs. While the volume of awards has significantly increased, committee expectations have also increased due to the increase in advising offered by the OUR and the subsequent higher quality of students' proposals.
- **Better outreach to students:** While the OUR has made significant in-roads in certain fields (Theater, History, American Studies), many students remain unaware of the potential opportunities to conduct research while at Northwestern. Research might not be the choice for everyone, but OUR needs to develop a better way to at least let them know it is a possibility.

PART THREE: UNDERGRADUATE RESEARCH IN LAB SETTINGS

With the already established success of lab-based undergraduate research experiences, the work of the OUR has been to help facilitate and refine existing opportunities, rather than create new programs. However, there have been significant steps taken in this area as well.

- **Development of Lab Seeker Resources:** From a student's perspective, finding a lab is the most important but also most opaque part of the research process. Each lab has its own recruitment and retention process, which students largely have no idea how to navigate. Using [Northwestern Scholars](#), OUR offers advising to teach students how to find the most appropriate labs given their personal research interests and to assist them in reaching out in an appropriate and professional manner to the labs themselves. OUR wants students to be more proactive in seeking out the best possible situations for them, while at the same time ensuring they are respectful of faculty time and resources, to create more impactful opportunities for both the lab and student.
- **Usage of Global and Research Opportunities Database:** Lab students have many more options for potential research experiences, including REUs, fellowships, direct lab funding, URGs, and in limited cases URAP. The [G&RO database](#) provides a comprehensive place to search through and compare these options, especially when reviewed with a OUR advisor and/or lab members.
- **Redefine URG Expectations:** The Undergraduate Research Grant program is widely used by lab students. However, the collaborative nature of lab research creates its own set of concerns and issues that have been addressed in the following ways:
 - **Clarifying independence:** The URG Committee understands independence as the student having autonomy over the project, not that it is wholly separate from the faculty's research agenda. It is only realistic for students to use the existing resources of the lab since lab equipment and materials are prohibitively expensive. This environment accurately reflects how research is conducted at every level within these disciplines, where researchers at the graduate, post-doc, and faculty-level work on interconnected projects using shared resources rather than working entirely alone. Still, the expectation is always that the student is not merely a research assistant doing the faculty's project (that is what URAP is for), but rather that the student has ownership over her/his project.

- **Project/Proposal Ownership:** Since labs are based upon a collaborative process, URG anticipates involvement by faculty or other lab personnel in the creation of a student's project and grant proposal. Again, the URG program needs to ensure independence. While it is impossible to conclusively determine authorship, the committee, particularly the Natural Science and Engineering sub-panel, is trained to determine whether it is realistic for the student to have written the proposal her/himself by looking at the current level of the student's relevant coursework compared against the literature and methodology explained in the proposal. If there are doubts about the student ownership of the project, committee members are instructed to rank the proposal poorly and offer feedback for a potential revise and resubmission, providing the student another opportunity to clarify the work involved if, in fact, it is a student-driven project. With the increase in underclass applications over the past few years, the committee is very sensitive to this issue.
- **Ongoing Evaluation Critiques:** In addition to the training handbook and annual meetings, the committee now regularly discusses new developments to ensure a fair and balanced review process across all fields of study.
- **Expansion of Post-Research Opportunities:** Via the efforts of lab faculty, a larger proportion of lab students seek out publication and presentation opportunities. OUR especially works to help them prepare to communicate effectively, since many students have little background in public speaking. OUR promotes the same opportunities listed above for non-lab students: **Undergraduate Research and Arts Exposition, Conference Travel Grants, CAURS, and NURJ.**

These efforts have helped lead to increases in the volume and success of students across lab and field-based fields, but OUR is aware that more is left to be done, including the following:

- **Work towards creating better lab opportunities:** Part of the new Assistant Director's job is to work with faculty and administrators to develop more REU and externally funded opportunities to get students into labs.
- **Better communication with labs and lab faculty:** With more opportunities available, the OUR will then be able to communicate more clearly the expectations of our programs, including emphasizing the focus on independent projects for URGs. With more options, OUR will be able to hone where students and labs should look for funding for different types of projects.
- **Expand G&RO:** There are 30-40 labs currently listed in G&RO, but there is a significant need for a more comprehensive resource, in addition to Northwestern Scholars, for students seeking lab opportunities. G&RO lab entries would list what the lab does, what roles undergraduates can play, and by what process the labs want to be contacted about potential openings.

PART FOUR: RESULTS, ASSESSMENT, AND FUTURE GOALS

Recently, the OUR has performed an assessment of its programs to see if it is reaching its stated goals that are aligned with the University's Strategic Plan, including increasing involvement in students from non-lab disciplines, increasing awards for creative projects, increasing awards for international projects, increasing overall participation of undergraduates across all fields, and improving feedback to students on their proposals that can be used for future applications/resubmissions. As seen already in this report, the overall number of student projects funded and URG revise/resubmit results indicate significant success in these last two areas. There has also been dramatic growth in funding of first and second year students and projects occurring internationally. For example, in the 2010 Summer URG competition, 34 first and second year students were funded (out of 107 total winners), but in the 2014 Summer URG competition, 66 first and second year students were funded (out of 167 total winners). While 11 international projects were funded for the summer of 2010, 38 were funded for the summer of 2014. There were also five times more creative projects funded in that same time period, plus the OUR started a Creative Arts Festival to showcase creative projects as part of the Undergraduate Research and Arts Exposition.

Collaboration between the URG program and programs run by schools and departments has increased not only the volume of students funded, but also the quality of the work done. By passing on the URG Review Committee's feedback, students are given the opportunity to revise their work, and other funding groups see what the initial assessment of the proposal was, enabling them to track growth and dedication. Therefore, students are learning more about the actual process of revision involved in research preparation while maintaining more opportunities to receive funding for their projects.

Further assessment of the URG program demonstrated that success rates for faculty and departments from across the research spectrum were consistent with the average success rate of the program, although it also discovered some inconsistencies in the OURs outreach across faculty and departments. While the volume of applications and awards is certainly higher within lab and field-based disciplines, the success rates remained consistent between physical science, social science, and humanities/arts proposals. OUR learned valuable information in this process and has outlined a number of steps it intends to take to ensure all students in all fields are treated equitably. A copy of the URG-specific Assessment Report can be found in the appendix.

In addition, as part of a preliminary analysis, OUR analyzed the success rate of lab-based applications to non-lab-based applications to the Academic Year URG program, comparing the 2008-09 year before the implementation of the above-outlined initiatives and the recently completed 2014-15 year. **[Figure 4]**

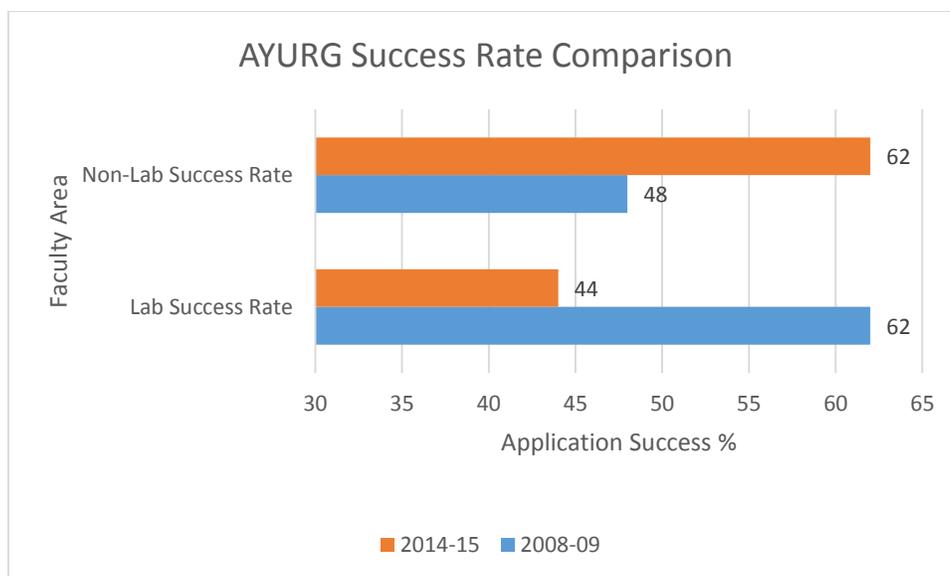


Figure 4: Comparison of the success rate of student applications from lab and non-lab fields within the AYURG program. NOTE: 2008-09 is the year before the current director was hired and initiatives designed to promote non-lab applications were begun.

This graph suggests that progress is being made in supporting and assisting non-lab applicants to the URG program as well as tightening the standards of independence used by the URG Committee to assess lab and field-based projects. OUR plans to expand the data collection on this issue in the coming year to monitor this potential trend. OUR also found that students and faculty that take advantage of the revise and resubmit option have a significantly better chance of success. The volume of applications remains higher in the lab and field-based disciplines since there is a higher volume of faculty in those fields.

The Office of Undergraduate Research sees these results as only a starting point for our continued goals of creating opportunities for every interested student to participate in research experiences and hopefully conduct an independent project during their Northwestern career. To that end, the OUR recently formed an Advisory Council which includes significant participation by faculty, administrators, and students. This group will continually help us review programs and policies as well as help us to set directions for the future. The 2014-15 council membership can be seen at the beginning of this report.

In addition, the OUR is committed to not only helping students obtain research experiences, but also helping them through the challenges inherent to conducting independent research. Therefore, the OUR has formed a Peer Research Mentors group, consisting of previous URG winners who are trained to support and encourage students throughout their summer research time (and help promote opportunities during the academic year). The Director has also joined the committee overseeing the redesign of Northwestern Scholars and will advocate strongly for the importance of the undergraduate experience for this database. Finally, through the review and assessment process, the OUR has discerned the following immediate goals:

- OUR will work with the Searle Center for Advancing Learning and Teaching to develop a new version of the Humanities Research Workshops taught previously based upon the successful

Searle model from the Science Research Workshops. They will focus on providing step-by-step assistance for students from all non-lab fields who are interested in pursuing research either through URAP or URG. The pilot program will begin in 2015-16.

- OUR will reach out to the departments found to have low URG acceptance rates relative to their application rate (see assessment report) to communicate programmatic goals and expectations and to learn what they need to improve their success rates.
- OUR will reach out to thesis programs to ensure they are aware of the AYURG resource available for their students and work with them to try and facilitate the process for students and mentors.
- OUR will reach out to individual faculty members, including the 30 least successful from the assessment report, to communicate programmatic goals and expectations and to learn what they need to improve their success rate.
- Since over 10% of successful URG submissions come from students being mentored by professional school faculty (Feinberg, Kellogg, and Law), a surprisingly robust figure, OUR will conduct more outreach to these schools to develop increased opportunities, working with a new intern next year (a FSM PhD candidate) who will help develop these efforts.
- OUR will reach out to successful faculty sponsors to create a new advising guide for faculty interested in getting involved. OUR seeks to build on the knowledge of successful faculty sponsors already within the program to help new sponsors who are looking to get involved. OUR will create a new web page with this information and will communicate the resource via departmental listserves and other avenues presented by departments and faculty.
- OUR will begin to explore the possibility of means-testing to see if there is a need to offer larger grants for students with more profound financial needs. Working with the Office of Student Enrichment Services, OUR will seek out ways to ensure that students with need aren't self-selecting out of the process due to financial restraints.
- Finally, OUR will continue to seek out financial resources to support the rapidly increasing volume of undergraduate research participants. Awards from OUR programs have more than tripled in only six years, and there is still significant room for growth. Establishing consistent budget support will be key to our ability to maintain the momentum of encouraging all undergraduate students to engage in independent research during their Northwestern career.

Much has been done to establish and support undergraduate research programs at Northwestern, but the OUR is aware of what still needs to be done. The OUR hopes this report explains the developments that have been undertaken and the rationale behind the choices made. As we move forward, OUR seeks to always remember that our primary mission is to support and encourage undergraduates to pursue their dreams and passions through research. Through faculty mentoring and the intellectual and creative capacities of Northwestern students, OUR desires to play a significant role in preparing students to effectively face the challenges of our world.

Research is the buzz you get in your stomach, the rumble in your heart.

It's a question that keeps nagging you to find the answer.

It takes guts and bravery to answer the call to research.

So while everyone can do it, not everyone dares.

- Tasha Richardson (SESP 2010)

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APPENDIX A:

UNDERGRADUATE RESEARCH GRANT (URG) ASSESSMENT REPORT 2011-2014

**PREPARED BY: DR. PETER CIVETTA,
DIRECTOR, OFFICE OF UNDERGRADUATE RESEARCH**

UNDERGRADUATE RESEARCH GRANT COMMITTEE

2014-2015

Natural Sciences and Engineering Sub-Panel:

Trish Beddows, ISEN

Neal Blair, Earth and Planetary Sciences (Chair)

Tom Bozza, Neurobiology

Marco Gallio, Neurobiology

Tracey Hodgson, Biological Sciences

Bob Holmgren, Biological Sciences

Joshua Leonard, Biological and Chemical Engineering

Seda Memik, Electrical Engineering and Computer Science

John Mordacq, Biological Sciences

Fred Northrup, Chemistry

Mario Ruggero, Communication Sciences and Disorders

Regan Thomson, Chemistry

Social Science and Journalism Sub-Panel:

Karen Alter, Political Science

Lori Beaman, Economics

Cynthia Coburn, SESP

Jaime Dominguez, Political Science

Jeremy Freese, Sociology

Robert Launay, Anthropology

Craig LeMay, Journalism

David Rapp, Psychology/ SESP

Erin Waxenbaum, Anthropology

Humanities and Creative Arts Sub-Panel:

Bernard J. Dobroski, Bienen School of Music

Hannah Feldman, Art History

Rebecca Gilman, RTVF

Barnor Hess, African-American Studies

Amy Kehoe, Office of Fellowships

Evan Mwangi, English

Emily Rohrbach, English

Elizabeth Son, Theater

Ji-Yeon Yuh, History

OVERVIEW:

- ◆ Four years of full data (academic years 2010-11 to 2013-14)
- ◆ Data come from the application system and are based upon faculty departments as reported by students , i.e. it is not the majors of the students, but the departments of their advisors. **All data are self-report from students from within their URG applications.**
- ◆ With AYURGs, applications are handled individually, so if a student applied, was rejected, re-applied and was awarded, it will appear as two separate applications (one successful, one unsuccessful).
- ◆ The program is currently adjudicated by a 30-member faculty review committee (size of committee has grown over time studied).
- ◆ The committee is broken into three subgroups: Natural Sciences and Engineering (NSE); Social Sciences and Journalism (SSJ); Arts, Humanities, and Performance (AHP).
- ◆ For Summer URGs, faculty review almost entirely within their subgroup; for AY URGs, faculty may review more broadly, but the expectation is that faculty will always review proposals in their areas of expertise.
- ◆ Applications are scored on a 1-5 scale, with 1 being the best.
- ◆ The average success rate for Summer URGs is 51%; the average success rate for Academic Year URGs is 56%.
- ◆ There are many reasons why students do not get funded. Students without a clearly defined project, those who start the process too late, and those without real faculty support in the development of their project and proposal will always fare poorly in these competitions. Given these factors, **this report focuses its analysis on faculty sponsors with 4 or more applications in the four year time period of this study** (average of at least one application per year).

KEY FINDINGS:

- ◆ We discerned a threshold score for funding. Only 19 proposals out of a total of 1445 submissions with a score greater than 2.333 (1%) were funded , indicating a clear level of expectation from the URG Review Committee. Even though project development and proposal writing are new experiences for students, we feel that it is a realistic target given: 1) the advising resources offered, 2) the committee's ability to fund all projects they feel deserve it, and 3) the resubmission process for AY URGs.
- ◆ In order to maintain the high standards of the committee, clear and compelling outreach to sponsors and departments around expectations and resources can improve students' chances of receiving funding. We will outline specific plans at the end of this report.
- ◆ The data clearly indicates broad success across all types of research experiences, with the vast majority of school, department, and specific sponsor success rates in line with program averages. Our most successful departments and sponsors come from all research backgrounds; a similar broad pattern appears in our least successful group.
- ◆ Since no generalizable gaps appeared in the data analysis, we envision doing targeted outreach to help specific departments/sponsors.
- ◆ 595 different faculty members have served as URG sponsors over the past four years, indicating the broad reach of the program and the incredible support it receives from faculty.

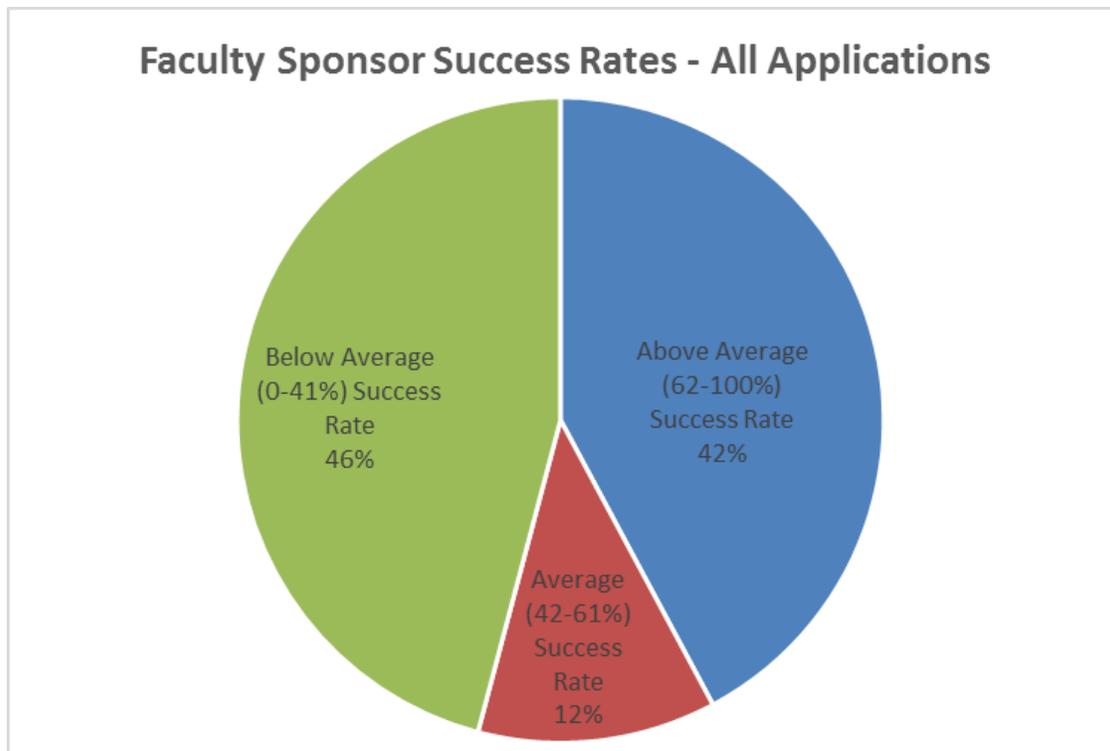
SUMMARY ANALYSIS OF ALL APPLICATION DATA (2011-2014):

Combined AY and Summer Success Rate by School

School	Submissions	Awards	Success %
BIENEN	15	10	67%
COMM	106	52	49%
FSM	145	80	55%
KELLOGG	6	3	50%
LAW	2	1	50%
LIBRARY	1	1	100%
MCC	171	88	51%
MEDILL	48	20	42%
SESP	46	25	54%
WCAS	905	474	52%

OVERALL	1445	754	52%
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- ◆ 595 unique faculty sponsors
 - ◆ 252 sponsors (42%) have a success rates of over 10% above the average acceptance rate of 52%
 - ◆ 71 sponsors (12%) have a success rate +/- 10% of the average acceptance rate of 52%
 - ◆ 273 sponsors (46%) have a success rate of 10% below the average acceptance rate of 52%



TAKE AWAY: A majority of all faculty sponsors have success rates within 10% points of the overall program average. Faculty across all schools have success rates within 10% points of the overall program average.

SUMMARY ANALYSIS OF FACULTY WITH ONLY 1-3 APPLICATIONS BETWEEN 2011-2014:

ACADEMIC YEAR URGs:

- ◆ 57% of all AY URG sponsor applications (116 out of 204) were successful.
- ◆ Average AY URG success rate is 56%.

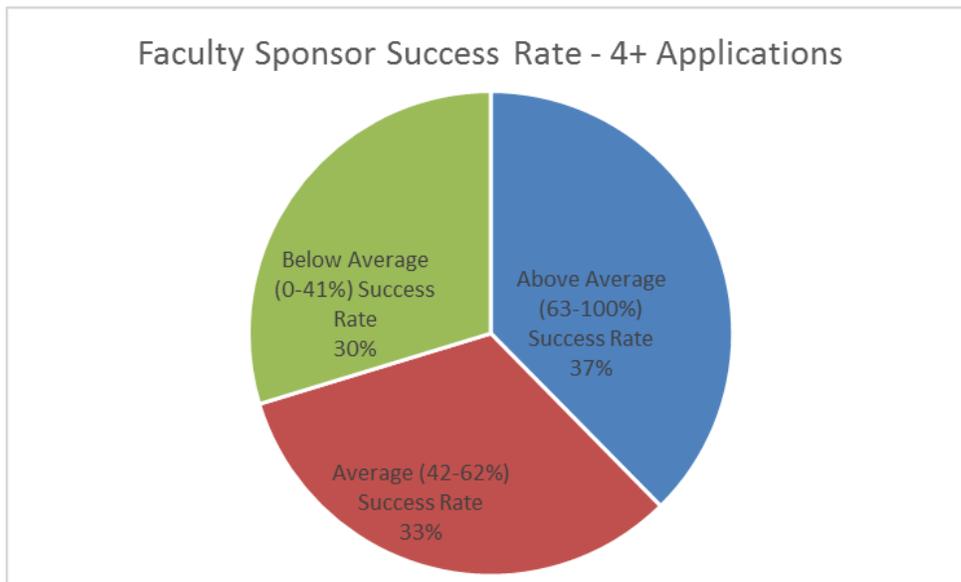
SUMMER URGs:

- ◆ 47% of all Summer URG sponsor applications (320 out of 678) were successful.
- ◆ Average Summer URG success rate is 51%

TAKE AWAY: Sponsors who apply in small numbers regularly have their proposals accepted.

ANALYSIS OF ALL FACULTY SPONSORS WITH 4+ APPLICATIONS BETWEEN 2011-2014:

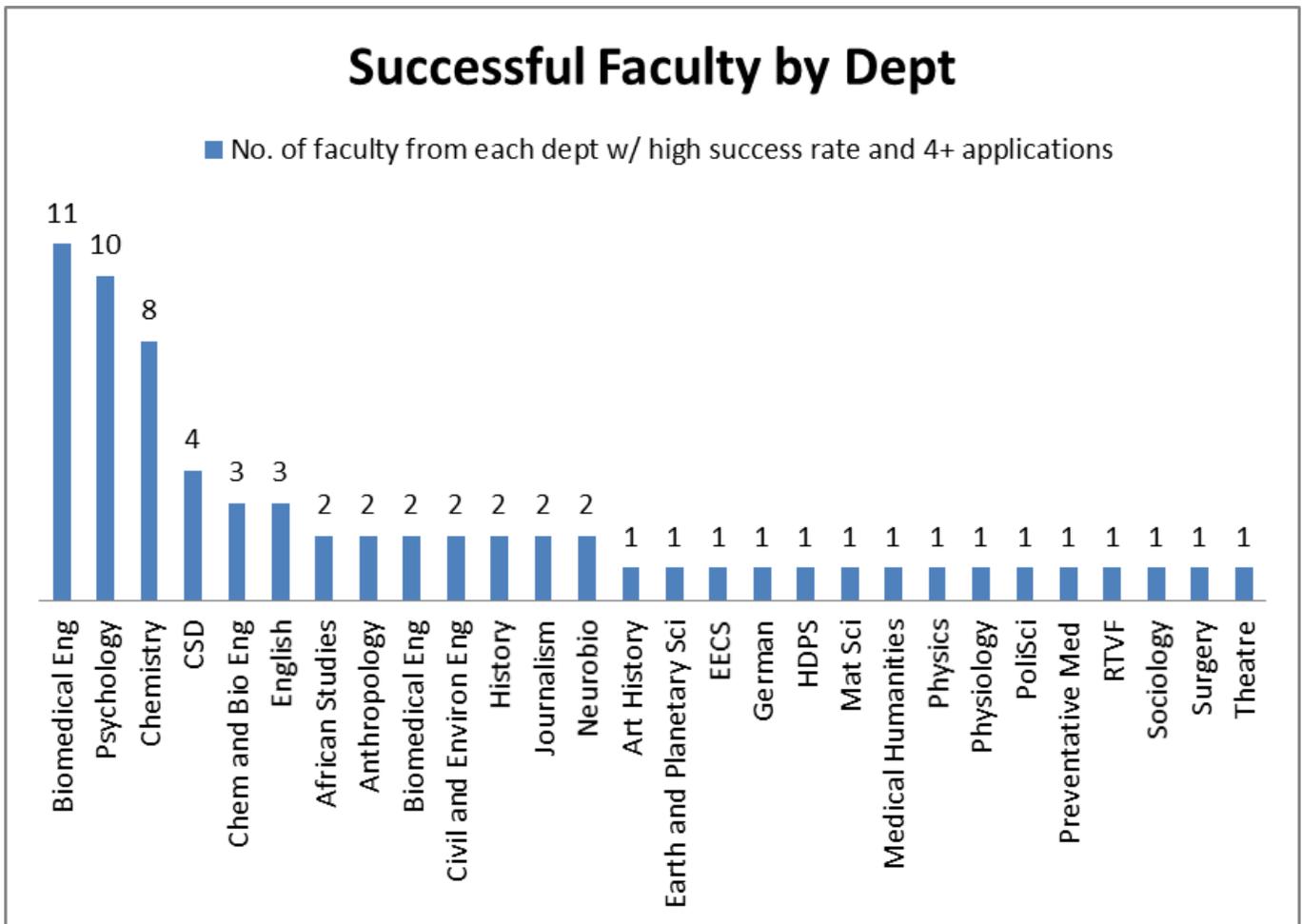
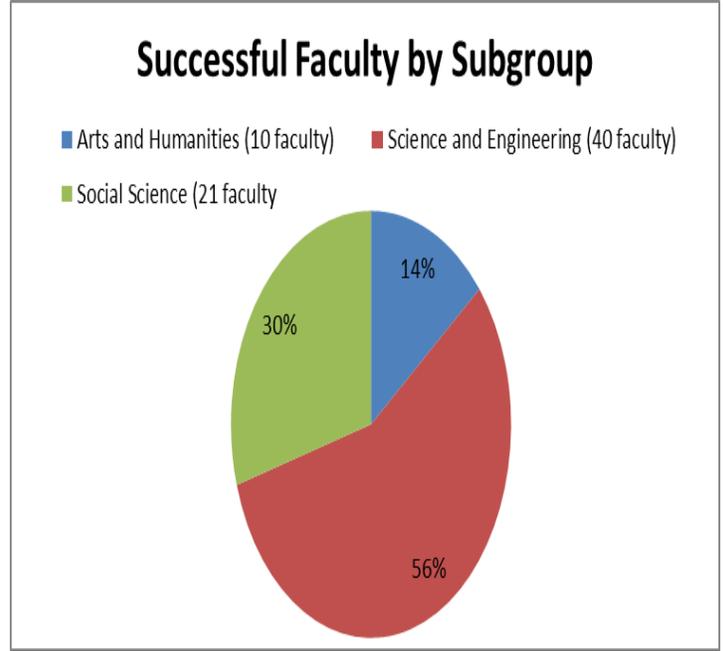
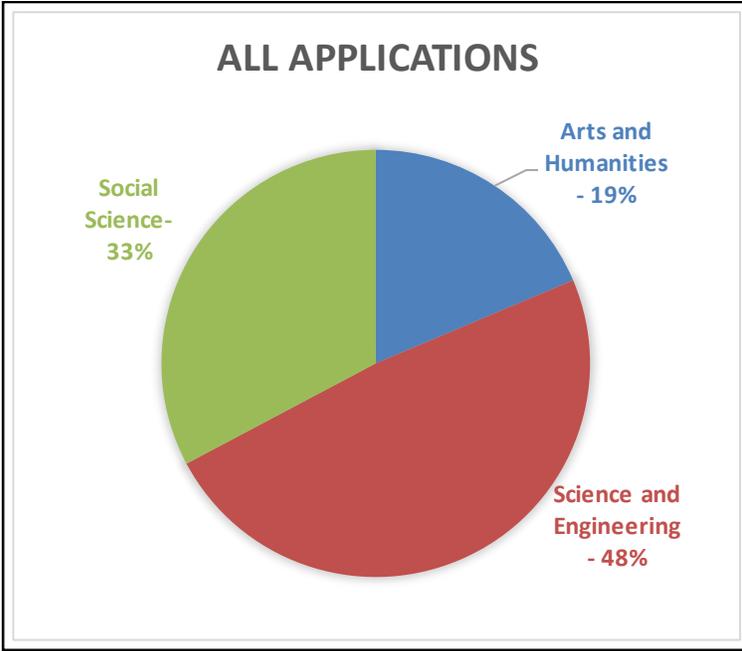
- ◆ 101 unique faculty have sponsored four or more URG applications between 2011-2014.
- ◆ 71 faculty have success rates within 10% points or higher of the overall success rate of 52%.
 - ◆ 38 (37%) faculty have success rates more than 10% higher than the average success rate.
 - ◆ 33 (33%) faculty have a success rate within 10% of the average success rate.
- ◆ 30 faculty (30%) have success rates more than 10% below the overall success rate of 52%.



TAKE AWAY: 70% of all faculty who have sponsored 4 or more URG applications have a success rate within 10% or better than the overall program average of 52%. Sponsors who apply in larger numbers have high acceptance rates.

ANALYSIS OF SUCCESSFUL FACULTY SPONSORS WITH 4+ APPLICATIONS:

- Successful faculty sponsors come from all subgroups. Science and Engineering applications make up nearly 50% of the total number, so their disproportionate representation is indicative of the volume of applications. Their success rate remains similar to social sciences and humanities. Applications. NOTE: The bottom chart is broken down by individual faculty member as identified by her/his home department. If a department is listed twice, it is because more than one faculty member appears within this group of successful faculty.



KEY TAKE AWAYS and FUTURE GOALS:

- ◆ Of the 17 departments where faculty have poor acceptance rates, 12 of them also have faculty in our most successful group. We feel that this fact indicates that outreach is largely needed on an individual faculty (not departmental) level.
- ◆ The 5 departments with faculty with low success rates (and no corresponding high performing faculty) are: African-American Studies, International Studies, Neurology, Pediatrics, and Religious Studies. In each case, only one faculty member had more than 4 applications, indicating a low level of overall departmental investment.
- ◆ OUR will reach out to these five departments (and others with low acceptance rates) to assess what they need to improve their success rates, particularly focusing on those with more than 4 total applications.
 - ◆ For example, the OUR Director met with the faculty in the Economics Department to discuss the low rate of applications (for such a large major) and their low rate of acceptance, collectively determining new steps that worked for the faculty involved.
- ◆ OUR will also reach out to all thesis programs to ensure they are aware of the AYURG resource available to their students and work with them to try and facilitate the process for students and mentors.
 - ◆ For example, the Sociology Department has had a low success rate with AYURGs, and so the OUR Director will reach out to the thesis seminar instructor for 2015-16 to discuss ways improve communication of expectations and requirements between the two programs.
- ◆ OUR will reach out to individual faculty members, including the 30 least successful, to assess what they need to improve their success rates, particularly focusing on those with more than 4 total applications.
 - ◆ For example, the OUR Director contacted and met with 3 faculty during the most recent SURG application period to help them better understand expectations for sponsors within the program and offered tips to assist their work with students.
- Over 10% of successful submissions come from graduate school faculty (Feinberg, Kellogg, and Law), a surprisingly robust figure. More outreach can be done to these schools to develop increased opportunities since there are clearly faculty willing to work with undergraduates. OUR will be working with a new intern next year- a FSM PhD candidate, and she will help us develop these efforts.
- ◆ OUR will also reach out to successful faculty sponsors to create a new advising guide for faculty interested in getting involved. OUR seeks to build on the knowledge of successful faculty sponsors already within the program to help new sponsors who are looking to get involved.
 - ◆ OUR will create a new web page with this information and will communicate the resource via departmental listserves and other avenues presented by departments and faculty.