

CUR Focus

Leveraging Federal Work-Study to Support Undergraduate Research

The “Students as Scholars” initiative at George Mason University is designed to give undergraduate students an opportunity to participate in research and creative activities within and beyond the classroom. Traditionally, students apply for funding through the Office of Student Scholarship, Creative Activities and Research (OSCAR), which runs a competitive grant-proposal process for independent projects and supports a limited number of students with advanced projects each semester. To expand support to more students, we became more innovative in seeking funding sources for undergraduate research. Based on our assessment, we found that Federal Work-Study funding was being underutilized at Mason and that students who work to pay for college are more likely to work off-campus and are thus less likely to be engaged in enriching academic experiences. Given this, we collaborated with the Office of Financial Aid in spring 2013 on a pilot program using Federal Work-Study funds to support undergraduate research assistantships.

This program expanded opportunities for students to be introduced to the concept of scholarship and to learn the research or scholarly methods in their fields while keeping them engaged on campus. Faculty members were given “free” research assistance, with the understanding that they would involve students in research discussions and regularly evaluate them. In the past two years, we have offered 149 positions and placed 95 students in OSCAR Federal Work-Study Research Assistantships (OSCAR RAs). Here we explain the complexities of utilizing this funding source, discuss the development of a strategic partnership, demonstrate how to overcome some of the challenges that are inherent in creating a program such as this, and discuss the lessons learned from two years of implementation.

George Mason University is a public university with high research activity located in Fairfax, Virginia, less than 10 miles from Washington, D.C. More than 198 degree programs (81 of them undergraduate) serve a population of more than 33,700 students (21,672 of them undergraduates), including a significant number of transfer students. Reflecting the diversity of the capital region, fewer than half of our undergraduates identify themselves as white; 14 percent identify themselves as Asian, 9 percent as African American, 10 percent as Hispanic, and 12 percent as other or from two or more backgrounds (or unknown). Despite the location in an affluent region, 57 percent of Mason students receive financial aid (Office of Institutional Research and Reporting, George Mason University 2014).

In 2010, Mason developed a quality-enhancement plan (QEP), titled *Fostering a Culture of Student Scholarship*, for its reaccreditation by the Southern Association of Colleges and Schools (SACS). It outlined a new university-wide initiative, also known as Students as Scholars, to give undergraduates an opportunity to participate in research and creative activities. Student scholarship is specifically defined as the process of generating and sharing knowledge or creative works, and it includes undergraduate research and creative activities. The three major goals of the Students as Scholars QEP are to develop the infrastructure to support student scholarship, increase opportunities for scholarly inquiry, and enhance the awareness and visibility of scholarship at Mason (Eby and Usher 2014).

OSCAR supports student scholarship and is the home to Mason’s Students as Scholars initiative. OSCAR transforms the undergraduate experience by connecting students to the research and creative mission of the university and to faculty members. The initiative supports individual research opportunities, supports student travel to report on their research, promotes curricular integration of research projects, and sponsors celebrations of undergraduate research. Our core values include inclusiveness, collaboration, innovation, and an orientation toward supporting the student and faculty experience. Students are exposed to increasing levels of engagement, beginning with the discovery of scholarship, moving through scholarly inquiry, and culminating with the creation of a scholarly or creative project (Figure 1).

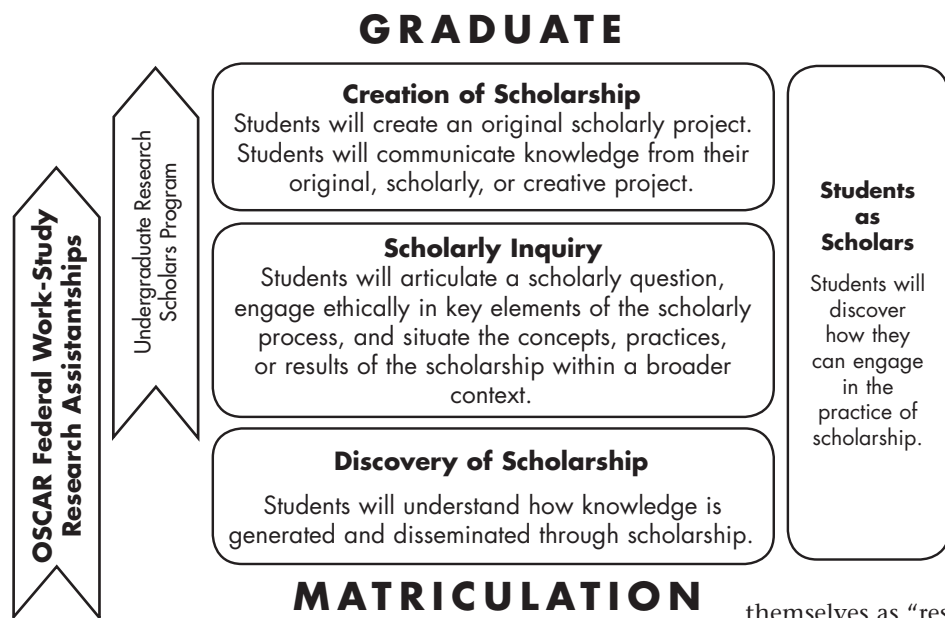
Since December 2011, more than 10,000 undergraduates have participated in at least one OSCAR activity, and more than 1,000 have conducted original scholarly work. Due in part to the success of our programs, scholarship is valued as a core characteristic of the university’s vision for “The Mason Graduate” (George Mason University 2014). Student scholarship is certainly on track to become pervasive across campus.

The Students as Scholars initiative scaffolds students’ learning outcomes related to undergraduate research. The OSCAR Federal Work-Study Research Assistantships are intended to meet the “discovery” and “scholarly inquiry” levels shown in Figure 1.

The Problem

In their report, *Developing Undergraduate Research and Inquiry*, Healey and Jenkins (2009) suggest that some form of research exposure should be made available to all undergraduate

Figure 1. Scaffolding of Students as Scholars Initiative



students and that special experiential opportunities be offered to select students. Research demonstrates that involving undergraduates in scholarship better prepares them for their career goals and advanced study (Association of American Colleges and Universities 2007; Russell, Hancock, and McCullough 2006; Hart Research Associates 2015; Osborn and Karukstis 2009).

The Students as Scholars initiative adopted this thinking in our student-learning outcomes, where it is expected that a modest number of students will actually be involved in conducting original scholarly work (the “creation of scholarship” level in Figure 1); that a substantial number will be impacted by curricular innovations in terms of “scholarly inquiry”; but that the majority of students will acquire an awareness of scholarship (“discovery of scholarship”). All students will have an understanding of the opportunities that are available to them at Mason as outlined in Figure 1 (Usher, Eby, and QEP Planning Committee 2011). The intention of our tiered learning outcomes is that we introduce all students to research, and offer all interested students the opportunity to participate in a research or creative activity while at Mason.

In our original plan, we used university resources (state funding) to establish our competitive Undergraduate Research Scholars Program (URSP), designed to give select undergraduates an opportunity to conduct independent research and/or undertake creative activities under the guidance of a mentor. The goal has been to support a limited number of students (currently 140 to 160 annually) who are at the “creation of scholarship” level, targeting students who are capable of creating and communicating knowledge from an original, scholarly, or creative project. We have found that the undergraduates who win funding through our office are

students who would typically participate in research or creative activities because they have been prepared for this top level of engagement through past coursework and direct experience.

However, despite an increase in the number of applications, the URSP has not made significant impacts on students who did not already see themselves as positively inclined toward participating in research. Our assessment showed that Mason needed to find creative ways to give students who had, because of their academic and economic backgrounds, few opportunities to engage in research and who did not enter Mason envisioning

themselves as “researchers.” Students as Scholars is committed to the value of the undergraduate research experience for all students, especially because research indicates that the greatest gains from involvement in research or creative activities develop among those students who are ill-prepared (Gregerman 2009).

We knew from the results of our administration of the National Survey of Student Engagement that students who work to pay for college are more likely to work off-campus and are thus less likely to be engaged in enriching academic experiences (Office of Institutional Assessment, George Mason University 2010, 2013). Thus it has been a priority over the past five years to find additional ways to get economically at-risk students jobs on campus. OSCAR wanted to give these students an opportunity to learn about research at the discovery and inquiry levels without expecting that they would necessarily conduct independent research at the level of creation of scholarship.



Jose Agumatang, OSCAR RA, presents his research on music and memory at the Summer Celebration for Student Scholarship, August 7, 2015.

The number of faculty members mentoring students at Mason was also a concern, as only a portion of faculty members worked regularly with undergraduates. Mason's departmental survey revealed that some on the faculty were not confident that undergraduates had the ability to "do research" at the highest level. Limited funding meant that new faculty, term instructors, and faculty in non-STEM (science, technology, engineering, and mathematics) fields did not have the funds to support undergraduates' research, especially for pilot projects (Hazel and Usher 2014). Yet our commitment to creating a culture of undergraduate student scholarship cannot be realized without faculty members' involvement; they are essential to our ability to carry out the goals of the Students as Scholars initiative.

The Solution

To address the concerns about inclusiveness and faculty mentoring, OSCAR looked for additional ways to support undergraduate research and discovered, as noted above, the opportunity to utilize Federal Work-Study (FWS) to pay students as research assistants (Troppe 2000; Kinkead 2003b; Danovitch, Greif, and Mills 2010). The purpose of the FWS program is to promote part-time employment of undergraduates who need earnings to pursue postsecondary education. The positions are to "complement and reinforce the educational program or vocational goals of each student receiving assistance," and research assistantships are specifically included (Grants for Federal Work-Study Programs 2010). Programs at the University of Michigan and University of Delaware have shown positive retention and academic achievement for students participating in undergraduate research for either academic credit or for work-study pay (Gregerman 1999; Hathaway, Nagda, and Gregerman 2002, Henry and C&EN Washington 2005). Other universities (including Harvard University, Northwestern University, the University of Virginia, and the University of Southern Florida) offer students the opportunity to use work-study to support research projects, but none have created a specific program to recruit, support, and assess a research-focused work-study program. Given the mission of this federal program and evidence of its success when used for undergraduate research assistants, OSCAR decided to design a FWS program aligned with the mission of the Students as Scholars initiative at Mason.

Students' eligibility for work-study funds is determined using the Federal Application for Federal Student Aid and is based on a federally mandated formula used to calculate "demonstrated financial need"—defined as the difference between the cost of attendance (tuition, books, living expenses) and

expected family contribution (Information for Financial Aid Professionals 2013; Perna, Cooper and Li 2006). FWS is one element of a financial aid package, which may also include grants, scholarships, and loans.

With scholarship valued as a core characteristic of the university's vision for "The Mason Graduate" (George Mason University 2014), OSCAR staff met with the Office of Financial Aid to see if this program could be used to create an innovative OSCAR research-assistantship program. Our request was met with enthusiasm. Mason was underutilizing our federally allocated FWS funding, and the financial aid office was eager to develop new programs that aligned with students' academic goals. OSCAR and the Office of Financial Aid piloted the OSCAR Federal Work-Study Research Assistantship (OSCAR RA) program in spring 2013.

The research assistantships expanded opportunities for students to be introduced to the concept of scholarship at lower levels of engagement (discovery and inquiry); to learn the research or scholarly methods in their fields; and to keep them engaged on campus. This program is intended to benefit both students and faculty members in that (1) students are given the opportunity to be involved in the research environment at Mason and gain insight into the process of research while learning skills that make them more successful as students, and later as professionals, and (2) at no cost to the faculty member or department, faculty are given "free" research assistance, with the understanding that they fully involve students in their research teams and regularly evaluate them.

Details of the Research Assistantships

Students eligible for work-study are allotted an award in their financial aid packet for the academic year that may only be earned through employment on campus or in approved positions off-campus (Information for Financial Professionals 2013). Mason students are typically allocated \$2,500 for the academic year. In the OSCAR positions, students earn \$8.00 an hour, equivalent to working 312 hours an academic year or about 10 hours a week. The financial aid office contributes the federally allotted share, which is 75 percent of the student's award, and OSCAR covers the remaining 25 percent. As the goal was to encourage new students and faculty members to participate, OSCAR decided to reallocate funding that could potentially have been used to expand the Undergraduate Research Scholars Program (URSP), shifting it to the work-study research assistantship program to make the program free for faculty. Thus, OSCAR budgets approximately \$625 per student per year, which means that we can fund three work-study research assistants in place of one

URSP student.

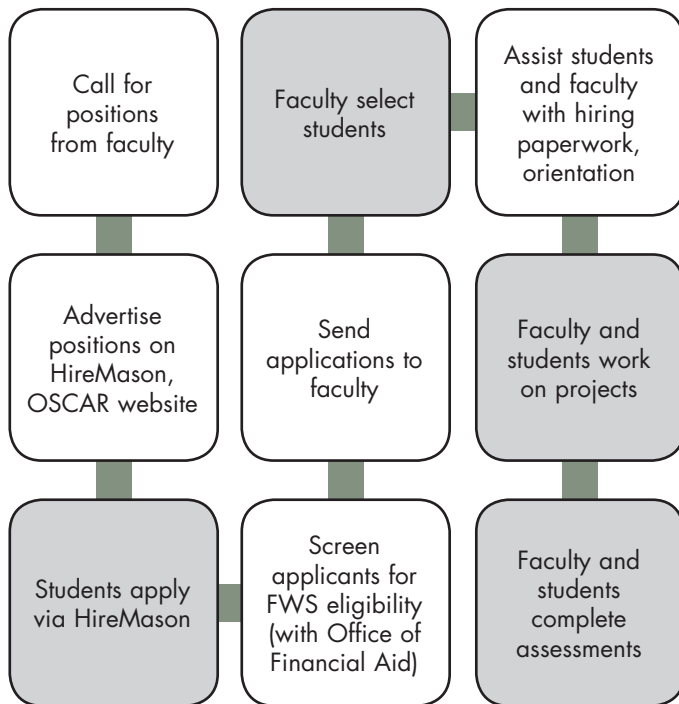
For our pilot program in spring 2013, author Nazaire, then OSCAR's graduate assistant, was charged with creating the procedural model and coordinating the research-assistantship program (Figure 2). The first step was to create a broad selection of research assistantships. OSCAR created a webpage to publicize the program and recruited mentors through OSCAR newsletters, department chairs, and word-of-mouth. Faculty members interested in offering positions were asked to write easily understood descriptions of their research projects and to identify suitable student characteristics (majors, skills, etc.). After receiving requests for the assistantship positions, the coordinator posted the available positions on Mason's career-services platform, HireMason, to reach interested students.

The next step in this model was hiring the students. After applicants were screened by the financial aid office to establish their eligibility for work-study funds, OSCAR forwarded the applications of eligible candidates to faculty members to be considered for employment. Faculty members had com-

plete autonomy to review eligible applications, interview students, and choose their assistants. Once those decisions were made, the faculty members informed the OSCAR office. OSCAR then coordinated with human resources personnel to streamline the hiring procedures; students met individually with our work-study coordinator for assistance in filing the required paperwork and securing appropriate personal identification.

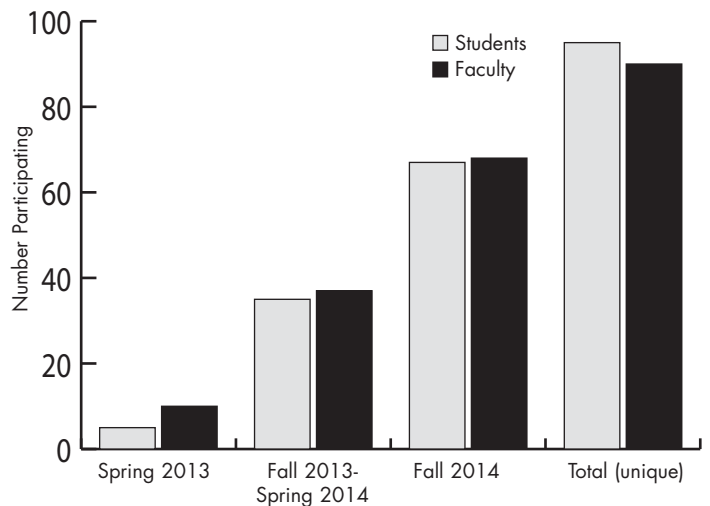
Assessment of the program happens every semester. OSCAR research assistants complete the OSCAR Student Survey (Hazel and Usher 2012) at the end of each semester. The goal of the survey is to track student participation and experiences in undergraduate research and creative activities, and to measure program and student outcomes over time as part of a longitudinal study of student learning. Students also answer a series of practical questions (administered through SurveyMonkey) about their experience and their plans for the future, including their intention to either graduate, continue with the OSCAR research assistantship, seek another work-study position, or not continue with work-study. Faculty mentors are similarly polled at the end of each semester to find out their interest in continuing in the program and with their OSCAR research assistant. Mentors also assess their students on the Students as Scholars student-learning outcomes using the initiative's program rubric (George Mason University 2013). These data are used to determine the research assistants' placements for the following semes-

Figure 2. Processes for Federal Work-Study Research Assistantships Program*



*White boxes indicate actions of undergraduate research office; gray boxes indicate student/faculty activities.

Figure 3. Number of Participating Students and Faculty in Research Assistantship Program*



*Note: The total counts each individual once, even if some participated over multiple semesters; it is not a sum of the annual numbers.

ters, as well as to evaluate the program as a whole and make adjustments as needed.

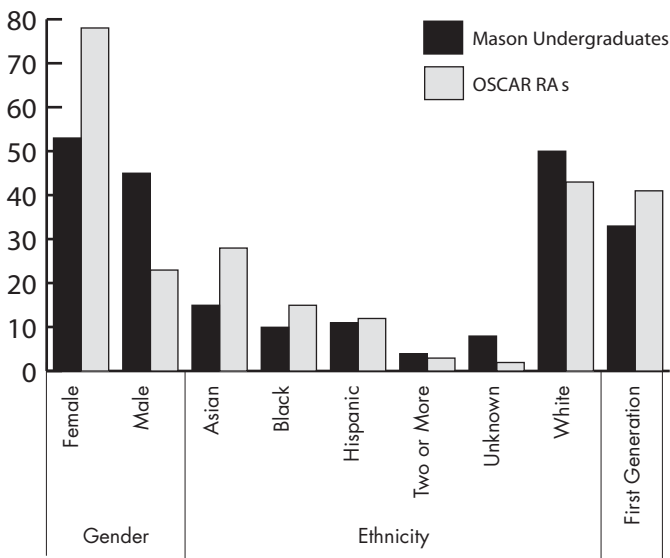
Outcomes

Since our pilot in spring 2013, the OSCAR RA program, as noted above, has offered 149 positions and successfully placed 95 students in research assistant positions. Our program has grown from five students in the pilot semester to 36 students in the second academic year to approximately 66 students participating in fall 2014 (Figure 3).

Of the 95 students who have participated in this program, 81 (85 percent) had never before participated in a research project or creative activity at Mason.

The participation of economically disadvantaged students in undergraduate research has been associated with increased student retention (Nnadozie, Ishiyama and Chon 2001). At Mason, first-year freshman cohorts have an annual retention rate of 87.5 percent and full-time undergraduate transfer cohorts have a retention rate of 85.3 percent (Brown Leonard and Smith 2013). As the RA program is young, we can only measure semester over semester persistence. Across three academic years, OSCAR data indicate a 98 percent combined retention/graduation rate (students who either continued enrollment or graduated with bachelor's degree the semester following their research assistantship). Additionally, 21 (50 percent) of the first two years' OSCAR RAs continued in their positions for two or more semesters and/or persisted to

Figure 4. Demographic Comparison of Research Assistants and All Mason Undergraduates*



*Note: Office of Institutional Research and Reporting, George Mason University, fall 2014 student cohort.

Table 1. Factors Cited as Motivating Participation in Research Assistantships, By Percentages of Respondents

Moderate, 25-74 percent	Highest (>75 percent)
Meeting other students who have similar interests or goals	Being excited by or loving the work
Working on a project that might contribute to individual or community well-being	Gaining experience for career or graduate school
Being required by my academic major or program	Receiving compensation or pay
Earning RS (Research and Scholarship Intensive) designation on my Mason transcript	Working on a specific project of interest
	Working with a specific faculty member

graduation. It appears that OSCAR RAs have a higher retention rate than their peers, although at this point we do not have enough data to determine if this is due to the characteristics of the students who choose to participate or because of the program itself. Over time, we will track the research assistants to see if they continue to re-enroll and graduate at a higher rate than their peers and to better understand the role of the program in their success.

Our data show that even though we are exclusively targeting financially needy students, we are offering opportunities disproportionately to women, first-generation, and minority-group students (Figure 4). Undergraduate research can benefit not only economically disadvantaged students but also those who have other diverse backgrounds (Kinkead 2003a), by increasing their awareness of academic and career options and their understanding of the research process (Russell, Hancock, and McCullough 2006). OSCAR RAs closely reflect the proportions of students at various levels (freshman, sophomore, junior, senior) and the majors of Mason undergraduates over all. However, when compared to Mason undergraduates, Asians, blacks, and females are overrepresented in the OSCAR RA program, while white and male students are underrepresented. Forty percent of the OSCAR RAs are first-generation college students, while these students are only 33 percent of the overall Mason undergraduate population. OSCAR RAs are economically disadvantaged and a very diverse group.

Many students work to pay for the cost of a college education (Perna, Cooper, and Li 2006; King 2002), and assessment of our students shows that receiving compensation was a factor motivating them to apply for the research assistantships. However, students were motivated by many factors. (Table

1). OSCAR RAs also exhibited positive attitudes about their experiences. Most students felt that participating in a research or creative activity not only improved their academic experience and could help them become better professionals but also that the creation or discovery of knowledge was personally rewarding (Table 2).

In the survey above, students were asked to check all factors that motivated them to apply and participate in a research assistantship. No factor was cited by fewer than 25 percent of respondents.

OSCAR RAs perceive their experience in the program as contributing to their ability to understand the research or creative process in their field (cited by 71 percent), to understand how research is relevant to what they are learning in

Table 2. Research Assistants' Attitudes Toward Research*

Attitudes	Strongly Agree/ Agree	Disagree/ Strongly Disagree
Participating in research or creative activities improves the academic experience	100	0
Participating in the creation or discovery of new knowledge is personally rewarding	97.4	2.6
I take pleasure in learning about a subject in-depth	97.4	2.6
Being involved in research or creative activities can help me become a better professional in my field	97.4	2.6
I enjoy learning about people and experiences that are different from my own	97.3	2.7
Learning about research or creative works makes me more curious about the world	94.8	5.2
Advances in research can solve real-life problems	94.7	5.3
Learning about proper research methods and techniques is a valuable use of time	94.7	5.3
It is fun to work on problems that cannot be easily solved, or that take a long time to solve	94.7	5.3
Laws and policy decisions should be based on research findings	92.1	7.9
Professors who do their own research or creative works make better teachers	86.8	13.2
Most research focuses on problems that are too insignificant to really mean anything	15.8	84.2
Helping a professor with her/his research would be a waste of my time	7.9	92.1

*Student responses to selected questions from the OSCAR Student Survey after the first semester of participation (N=40).

their classes (71 percent), and to understand the difference between personal beliefs and evidence in supporting a position or drawing conclusions (79 percent). This correlates with faculty members' assessment of students' learning in their research assistantships. Seventy-nine percent of OSCAR RAs were rated as proficient or better by their faculty mentors in competencies associated with the discovery of scholarship, and 77 percent were rated similarly in competencies related to scholarly inquiry.

These findings highlight the ability of the OSCAR RA program to serve as a form of disciplinary socialization (Healey and Jenkins 2009). The most unexpected outcome, however, was that 34 percent of students were rated by their mentors as being able to "take responsibility for executing a project" at an advanced level normally associated with the creation of scholarship, and fully 53 percent were considered as at least proficient on this measure. This finding suggests that although the program was aimed at lower levels of engagement, students are developing skills that indicate they are able to understand the scholarly process and make significant contributions to research.

Faculty involvement in the OSCAR RA program has increased from 9 faculty members in spring 2013 to 67 faculty members offering research assistantships in fall 2014. Of the 90 individual faculty members participating, 25 had previously mentored undergraduates; the remainder (72 percent) were new to OSCAR. Most faculty members represented disciplines within the College of Humanities and Social Science and the College of Science, Mason's largest colleges, but mentors represent seven of the eight units with undergraduate programs, and also come from research institutes, university-life units, and administrative areas. Our data also show that faculty at all levels (assistant, associate, and full professors, as well as administrative and research faculty) have hired OSCAR RAs, and the majority of these faculty members are in tenured or tenure-track lines.

While the reasons for mentoring undergraduates vary (Temple, Sibley, and Orr 2010), faculty participating in this program indicated that students are thoughtful members of their research teams and have made important contributions to their research. They were impressed with students' abilities to understand the research process, ask relevant questions, and interpret data.

Lessons Learned

After two years of implementation and responses to assessment, including student and faculty feedback, OSCAR personnel offer the following advice that may be useful to any

undergraduate research office in implementing similar research assistantships.

1. Work-study programs are implemented locally, vary by university, and can be more flexible than first assumed. Establish a positive working relationship with the financial aid office and use their expertise in implementing your program.
2. Faculty and students will be more inclined to be involved (and recruit others) when the process is easy. Identify a single point-of-contact in the undergraduate research office who can handle the administrative aspects and mediate among other campus units, including those dealing with financial aid and human resources.
3. Faculty members appreciate being able to hire students they believe fit their positions. Pre-screen applications for students' eligibility for work-study and other basic qualifications, and then allow faculty to interview and select their own research assistants.
4. The program will sometimes draw students who are not qualified for federal work-study funds. Encourage these students to contact mentors to see if other grant funding, volunteer, or credit opportunities are available on the project.
5. For some students, their RA position serves as their first work experience, and while they may be intellectually well-prepared for the work itself, they may be unprepared for the "work culture." Provide instruction on professionalism in both an academic and work environment, which can come in the form of one-on-one meetings with the work-study coordinator, an orientation session, and/or a handbook. We use these as opportunities to discuss professional attire, timeliness (commuting does not count as work hours), and communication with colleagues and faculty.
6. RAs will need some training and support before they can be productive. Help faculty find or provide the training needed (on health and safety issues, work with human subjects, software and hardware, etc.). Remind them that students should be paid for the hours they devote to this training.
7. Although it happens infrequently, as with any other job, occasionally a research assistant will have to be terminated. Student feedback indicates that even those students who were fired or not rehired still felt the experience was valuable. Enforce expectations for students to maintain the professionalism of the program.

8. After the initial exposure to research at an introductory level, students begin to look for additional opportunities to participate in projects. Communicate with them about other on-campus research programs, and encourage them to apply for off-campus summer research opportunities.

Success with such research assistantships ultimately relies on the relationship between the student and the faculty mentor. Faculty members need guidance about their roles in the endeavor, so OSCAR staff members work one-on-one with faculty in writing a position description that is accessible to undergraduate students and descriptive of the activities expected. Writing a student-focused description helps faculty define the student research activities and the capacity of students to do the work, and helps ensure that the experience will be valuable for both the student and mentor. We provide a faculty-orientation session each semester to set expectations about the roles of the research assistants and their mentors, including important but not entirely obvious advice about incorporating their RAs into their research teams (including paying them for attending lab/team meetings and training), regular meetings with RAs, communicating goals for the research project, and setting clear expectations about work hours and locations. All new mentors are given the handbook *How to Mentor Undergraduate Researchers* (Temple, Sibley, and Orr, 2010). Finally, OSCAR has also developed a faculty handbook specifically for our RA program, which is updated and shared with faculty mentors each semester.

Conclusion

Given the success of the OSCAR Federal Work-Study Research Assistantships, OSCAR has hired the former graduate assistant as a full-time program coordinator (Nazaire) with a half-time responsibility for the FWS program. Working in collaboration with the Office of Financial Aid and Career Services, we plan to expand the program to at least 120 positions per year over the next two years. The program coordinator also will be offering additional orientation and programming for new OSCAR RAs and their mentors, to improve their experiences and increase their understanding of the additional research opportunities offered at Mason.

The program has met our goals of broadening participation in undergraduate research for interested students at lower levels of engagement and also had some unexpected outcomes. Undergraduates, even at introductory levels, are capable of engaging in research. In fact, students are academically well prepared to work, learn professional skills quickly, and they value the opportunity for a real research experience.

The program has allowed us to introduce three economically disadvantaged students to research opportunities for every one student that the undergraduate research office would have been able to fund in our competitive Undergraduate Research Scholars Program. Students who participate are more likely than other Mason cohorts to enroll or graduate each semester and meet or exceed our expectations for their learning outcomes. The program encourages underrepresented students (first-generation, minority, and female) to engage in research. It also encourages new faculty to mentor undergraduate students and become impressed by the students' abilities. Unexpectedly, we found that the students were very highly rated by their mentors for their responsibility in executing projects. 🌱

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