

strategic pillar on diversity and inclusion in undergraduate research was the basis for the model. The hope in presenting this pilot is to provide the undergraduate research community with an innovative model to increase participation in undergraduate research by offering diverse and inclusive research experiences.

The Multicultural Center UAs engage in hands-on diversity and inclusion work, which provides them with a platform for later development of their own research projects. A central understanding of these positions is that the students' research projects may represent diversity in both topic and format, with students producing research projects in both traditional and nontraditional forms. The UAs serve as research assistants for a study on cultural competence on campus; work on projects such as the Community Conversations workshops where they assist in facilitating conversations with students about diversity, inclusion, and social justice; assist with developing lesson plans for a cultural competence course taught for credit on campus; and coordinate programs in faculty and staff mentorship as well as peer mentorship. Through the UAP, they can collaboratively develop programming and outreach to serve diverse students, through which they increase their own cultural competence. The program also assesses students' attainment of cultural competency through a performance evaluation process that examines the effects of the research experience and engagement in content concerning differentness, analyzing their role in student success.

### **Engaging Academically At-Risk Student Populations in Research: Initial Assessment of an Undergraduate Research Certificate Program**

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Since the University of Illinois Springfield (UIS) has been successful at recruiting a larger and more diverse undergraduate population, including academically at-risk students, more effort is needed to ensure their academic success. Thus, in collaboration with the Center for Academic Success in the Division of Academic Affairs, the Undergraduate Research Support program developed an Undergraduate Research Certificate program, seeking to encourage academically underprepared students to engage in undergraduate research by providing training and support services. The program is in the pilot stage with first-year students in the Students Transitioning for Academic Retention and Success (STARS) living-learning

community. STARS serves an academically underprepared student population that typically consists of minorities and first-generation college students.

In the freshmen seminar course, STARS students participate in a number of workshops that address topics such as the definition of research, benefits of engaging in undergraduate research, undergraduate research resources and opportunities at UIS, presentation skills, information literacy skills, writing and citation skills, and so forth. Students also complete additional workshops outside of the course to receive the undergraduate research certificate. This requirement helps ensure that only students who are intrinsically motivated to engage in undergraduate research receive the certificate and matriculate into research opportunities that involve direct work with faculty members.

The program expressly involves undergraduate students who have actively engaged in research across various disciplines, as they participate as workshop presenters. This particular approach serves to (1) heighten students' interest in and motivation for undergraduate research through peer explanations of benefits and enthusiasm about research, (2) increase students' self-efficacy by witnessing peer success in undergraduate research, (3) enhance the visibility of student researchers on campus, and (4) involve students in a culture of undergraduate research engagement.

Pretest and posttests were administered to examine student perceptions of research self-efficacy, perceived barriers, and interest in undergraduate research. Results from the pretest confirm that undergraduate students often lack self-confidence, awareness of opportunities, and the necessary skills to foster involvement in undergraduate research. Limited posttest data suggests the certificate program had a minor, positive effect on student perceptions. However, more data are needed to assess the effectiveness of the program. In the future, tracking student participation in undergraduate research after completion of the certificate is planned, as well as comparing outcomes for these students with those of similar academic backgrounds who do not participate in the program.

### **Increasing Potential and Widening Horizons: Promoting Undergraduate Research at a Two-Year Regional Campus**

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The University of South Carolina Lancaster (USCL)'s Research Club is a student organization established in 2015 as part of efforts to nurture a culture of scholarly

research on a two-year, commuter-based campus with many at-risk and first-generation students. This model provides opportunities to increase awareness of scholarly work among faculty and students, as well as to further meaningful scholarly endeavors. As a result of the Research Club, first- and second-year students have delivered 30 presentations at regional and national meetings, published more than nine peer-reviewed abstracts, and received six USC System awards from 2015 to 2017. Prior to the creation of the Research Club, only isolated opportunities existed for students to present or receive recognition for their research participation.

One strategy—improved accessibility to opportunities by undergraduates—came from *Characteristics of Excellence in Undergraduate Research* (CUR, 2012). The first step was to improve visibility of research on campus. It was learned that students were unaware of USCL's active scholars in multiple disciplines. Therefore, monthly lectures by students, faculty, and staff were established for club meetings. This lecture series seemed to be the easiest way to inform others about campus scholarship and provided a forum to promote student participation in research. Although the series boosted awareness of research production on campus, students still lacked understanding that they could be a part of the process.

The next step was to take a more active approach in recruitment of student researchers. As faculty members include “Integrative Learning” in course curricula, students could earn points toward their final grade by attending lectures and participating in research studies. Another facet of this approach was to create opportunities for peer mentorship and motivation. Research assistants were asked to share their experiences during club meetings, which modeled the role of students in the research process. However, interviews with research assistants revealed that even the most ambitious students lacked the confidence to ask instructors to join their research team. Faculty members had to actively speak about their desire to work with students and approach students individually to achieve the greatest success.

The Research Club sought to promote the benefits of participation in research. It was learned that students were unfamiliar with the ways that research could help them. They were attracted to the idea that research and presentation experience could be beneficial in applying for internships, jobs, or graduate school. These students were surprised to learn that such experiences and accolades could be added to their resumes.

This experience has illustrated that the “build it and they will come” mentality will not work with undergraduates. It often is assumed that, since the benefits of participation in such experiences are well known, students intuitively

would know the same. Much care has to be taken to cultivate a culture of research on campus and actively promote the opportunities for students.

### Reference

Council on Undergraduate Research (2012). *Characteristics of Excellence in Undergraduate Research*. Washington, DC: Author.

### A Preresearch Initiative Increases STEM Student Retention

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The benefits of an undergraduate research experience are well documented, but students often fail to take advantage of existing research opportunities because of low self-confidence and misconceptions about research. To address these issues, a series of preresearch activities was designed at Queensborough Community College (QCC) that were offered during spring, summer, or winter intercession. Students were recruited from an Introduction to Biology course and the first semester of the year-long general biology sequence for science majors. Student participation was voluntary. This “Gateway to Research” included both interactive detailed workshops on relevant topics and hypothesis-driven, hands-on research projects. Workshop topics included (1) maintaining a lab book, (2) understanding bioethics, (3) conducting a literature search, and (4) approaching the reading of a scientific paper. Several of the sessions were offered jointly to Gateway students and research students who shared their experiences in a grant-funded program. Students committed to 4–5 hour blocks per day for one week during summer or spring break, or two weeks during winter break. Projects focused on microbiology or cancer biology.

Formal lectures are avoided, but in small informal groups, students gained the basic knowledge to carry out the projects. Students would formulate hypotheses, design experiments (with guidance), and conduct the research. The cancer biology experiments required that the students learn the basics of cell culture and a common migration assay referred to as a wound healing or scratch assay. Culminating PowerPoint presentations were given by the students. They received certificates of completion and presented their results during the QCC-Honors conference in May.

Participants were guided to additional enrichment activities, and more than a third joined a research program. All the preresearch students persisted in a STEM curriculum at QCC and/or transferred to a four-year college with a STEM or health science concentration.