

NAME: W&M HHMI Undergraduate Science Education Program

INSTITUTION: College of William and Mary

STUDENT RESEARCH – SUMMER SCHOLARSHIP PROGRAM

Inputs	Strategies	Outputs	Outcomes		Impacts (Long Term)
			(Short Term)	(Medium Term)	
<p>Students from W&M - Wren Scholars</p> <p>Summer stipends for students (HHMI) Cost-share from W&M for stipends for all Wren Scholar participants.</p> <p>Primary W&M faculty mentors and secondary mentors in related fields</p> <p>Salary support from William and Mary</p> <p>Salary support from external funding (other grants)</p> <p>Departmental support for core facilities</p> <p>Faculty Advisory Committee: support and evaluate program</p> <p>Website to publicize program, submit and review applications, and disseminate results of program</p> <p>Mechanisms for tracking and evaluation</p> <p>Laboratory space</p> <p>Equipment</p> <p>Research supplies</p> <p>Free housing for students (cost share from W&M)</p>	<p>Provide support for students from W&M Wren Scholars Program to engage full-time for ten weeks in collaborative research with faculty mentors.</p> <p>Provide opportunity for students in the summer research program to become integrated with and important members of a community of scholars beginning with one-day social event.</p> <p>Schedule informal formal and meetings between students and advisors to enhance integrative and collaborative nature of program, and make students feel like part of a larger team.</p> <p>Organize weekly meetings and workshops on different topics relevant to research and expand access to ancillary support system activities to all science research students - presented by different faculty members; particular emphasis will be placed on quantitative and computational skills.</p> <p>Provide opportunities for weekly pizza lunches to discuss topics relevant to science research, e.g. ethics, how to make posters, etc.</p> <p>Structure application/registration process to develop professional scientific writing skills</p>	<p>Number of underrepresented/at risk students who participate in summer research experiences</p> <p>Number of faculty who mentor students in the program during the summer</p> <p>Number of students from underrepresented groups who present at the summer research symposium and other venues</p> <p>Number of students who participate in workshops and discussion groups</p> <p>List of collaborative research projects</p> <p>Scientific data generated from summer research</p>	<p>Students understand what is involved in conducting authentic research and appreciate research.</p> <p>Students feel like part of a larger research team within the lab and within the department.</p> <p>Students develop a comfort level in discussing science with professional colleagues outside of the immediate lab group.</p> <p>Faculty student teams accumulate preliminary and/or potentially publishable data.</p> <p>Students develop communication skills and present data at lab meetings, local undergraduate research symposia</p> <p>Students and faculty continue with research during academic year.</p> <p>Students value a community of scholars that engages students and faculty in collaborative scientific research.</p>	<p>Students from underrepresented groups and disadvantaged backgrounds have greater opportunities to engage in substantive research experiences</p> <p>Students continue their interest and involvement in scientific research throughout their undergraduate years.</p> <p>A greater number of students continue to major in STEM fields.</p> <p>Students who participate perform better in STEM courses.</p> <p>Students and faculty publish results of their collaborative research and present at professional meetings.</p> <p>Faculty submit grant proposals related to their collaborative work with students.</p>	<p>Increased number of URM students are engaged in science-related activities and professions following graduation.</p> <p>Students value integration of scientific research across levels of a discipline</p> <p>URM students and faculty contribute to the scientific community</p> <p>Institutions place a high value on providing significant undergraduate research as part of the institution's culture; institution is proactive about promoting diversity and recognizing its value.</p> <p>Institutions cultivate synergistic partnerships to leverage resources and promote undergraduate research to ALL students, especially those without prior experience</p>

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Evaluation Questions for OUTCOMES	Possible Indicators/Measures	Possible Data Collection Methods and Information Sources	Rank/Priority (include brief rationale)
<p>1. Do the summer research experiences contribute to the ability of students to propose, present, and defend their work; develop their leadership skills; and heighten their enthusiasm for and understanding of scientific research?</p> <p>2. Has the program resulted in successful mentoring of students?</p> <p>3. Does the collaboration result in long term success of both the students and faculty members?</p> <p>4. Does the program serve as a good model for increasing diversity in the sciences? Has the program had an impact beyond the institution?</p>	<p>1 a. Students are able to outline the purpose of a proposed research project, describe steps in the projects, implement the project, present results to a broader scientific community, and field questions about their research</p> <p>b. Students organize a summer research symposium in which they and their colleagues present and defend their work</p> <p>c. Students continue to pursue opportunities to conduct scientific research</p> <p>d. Students are excited about their research and continue to pursue opportunities to conduct scientific research</p> <p>2 a. Student demand for faculty-mentored research opportunities increases</p> <p>b. Students demonstrate positive attitude toward research</p> <p>c. Students participate in science related activities</p> <p>d. Students continue in research during academic year</p> <p>e. Students express understanding of what it means to do scientific research</p> <p>3 a. Faculty-student teams acquire and prepare data for grants, presentations and publication</p> <p>b. Research is continued by teams during the academic year</p> <p>c. Faculty obtain external funding</p> <p>d. Students and faculty publish research results</p> <p>e. Students and faculty present talks at meetings</p> <p>f. Students pursue post-graduate work in science related fields</p> <p>g. Students excel in academic and professional pursuits</p> <p>4 a. Program becomes implemented in other departments and other universities</p> <p>b. Faculty outside of W&M ask for information/material about program</p> <p>c. Faculty become active in effort to diversify science</p> <p>d. Information about the program is shared in science education publications and presentation</p> <p>e. Science education funding; funding for increasing diversity in the sciences is awarded to participants</p>	<p>1. a. Application for Summer Fellowship program</p> <p>b. Poster presentations and talks at summer symposium</p> <p>c. Pre-post questionnaires</p> <p>d. Senior Survey</p> <p>e. Proposals to present at professional conferences</p> <p>f. Annual student updates</p> <p>g. SURE/CURE</p> <p>h. Annual mentor reviews</p> <p>i. Self evaluations</p> <p>2. a. Applications for HHMI and other experiences</p> <p>b. Exit questionnaire</p> <p>c. Interview</p> <p>d. Focus group interviews</p> <p>e. W&M tracking of undergraduate research</p> <p>f. Registrar records</p> <p>g. Tracking data from W&M HHMI online system</p> <p>h. Student and faculty descriptive narratives</p> <p>3. a. Pre-Post questionnaires</p> <p>b. Faculty and student publications, presentations, grant funding</p> <p>d. Performance review</p> <p>f. CVs</p> <p>g. Funder's reports</p> <p>h. Student academic and professional awards</p> <p>4. a. Publications, grant funding</p> <p>b. Citations of publications</p> <p>c. Invited talks on both science and pedagogy</p> <p>d. Undergraduate long term tracking e.g. PhD programs entered</p> <p>e. Collaborations outside of W&M</p> <p>f. Activity on the W&M/HHMI website</p>	<p>Evaluation questions are ranked in order of how quickly an effect is expected to be seen. However data for all outcomes will be collected simultaneously.</p>