ABSTRACT

The Norwich University faculty-mentored Undergraduate Research (UR) program was initiated in 2003 to purposely develop a culture of undergraduate research. The program included research fellowships, grants, and travel to present completed work at conferences. In 2015, the program had 27 internally and 15 externally funded UR projects, up from two internally and two externally funded fellowships the first year. Travel support has also increased with comparable growth.

The number of faculty and students involved in the UR Program has increased steadily. Program data collected over 11 years, shows that the percentage of faculty involved as research mentors has increased and that 73% of faculty mentors repeat the process. Participation of faculty members employed 1-3, 4-6, and 36+ years has been tracked as a means of assessment. As the number of mentors sponsoring proposals has increased, the percentages of all three groups have steadily risen, as has the percentage of repeat mentors. Additionally, another measure involves the increase of faculty participation in the Council on Undergraduate Research (CUR), Institutes, Dialogues, national meetings, and business meetings across academic disciplines. Both measures suggest a healthy culture change since incoming and senior faculty perceive UR as an important aspect of their professional development.

Funding and administrative support are also contributing factors to a UR cultural shift. The Trustees, the President, and the Chief Academic Officer have given UR their full support by enabling endowed funds to be used for internal UR funding and the establishment and operation of an Office of Academic Research. Finally, a full-time grant writer/manager has been critical to provide institutional support for faculty pursuing external research funding.

GROWTH OF THE UNDERGRADUATE RESEARCH PROGRAM

Applied, Accepted, Denied
Initial participation in the Summer Student Research Program included two fellows with their mentors, and two NASA faculty mentored researchers. Summer 2013 had 27 internally funded student research fellows along with 15 student researchers funded by external grants. Those included students funded by DoE for the Solar Decathlon competition currently ongoing in Irvine, CA.

Improved Success
As the UR Program has grown and become more embedded in the culture, the quality of research proposals across all disciplines has steadily improved. This has resulted in increased funding levels rising from 55% to 80% over the past decade.

External Grant Support
During the life of our UR program we have seen significant increase in the number of students funded by externally generated funds, both as part of faculty grants and as a result of the initiative by individual students. This ties directly to the investment in faculty scholarship discussed subsequently.

EVOLUTION OF THE MENTORING POPULATION

Number of 'New and Early' Mentors Rises Over Time
The character of the mentor pool has evolved over time, presented here for mentors of successful proposals. Note that the first four mentors were all in their first 3 years at NU, and that more senior faculty quickly participated. Early mentors are now in the 'seasoned' (36+ years) group, but the number of 'new and early' faculty still continues to rise.

Balance of 'New and Early', 'Intermediate' and 'Seasoned'
The same data presented above shows how the campus has adopted the culture of engaging in original scholarly inquiry with students across the spectrum of faculty rank and experience. Each group (1-3 years, 4-6 years and 36+ years) now represents one-third of the mentors involved during the 10-week summer research program on campus.

Percentage of Repeaters Increases Over Time
Because faculty who mentor students almost invariably want to do it again and again, the number and percentage of repeat mentors continues to rise. This trend reflects what has been observed qualitatively as faculty search committees stress the importance of participation in student research. The embedding of this mentality throughout the faculty is also reflected in the expansion of research in the curriculum.

Mentors' Time Away From Grad School Drops
As the number of mentors has steadily increased through time, the character of the mentor pool has evolved. One notable change is that the average mentor is continuously closer to their graduate school days, despite the involvement of many senior faculty who have been at Norwich more than 30 years. For example, Prof. Gary Lord received his PhD in 1989 and has mentored 13 of our 167 fellows in the past 18 years.

PARALLEL EVOLUTION OF UNDERGRADUATE RESEARCH AND FACULTY DEVELOPMENT PROGRAMS

Limits of NU's Long-term FD Program
Norwich's endowed faculty development program is encumbered, with income historically outstripping expenses. Commitment to the UR program in 2003 initiated a significant shift in faculty drive to increase their own scholarly productivity. The University's strategic plan called in 2004 for that evolution, and the activity level (blue) rose past the income (red), and accrued funds from the old days are rapidly being depleted.

Co-investment in Undergraduate Research and Faculty Development
Norwich President Richard Schneider often remarks that vision without resources is a hallucination. Shown below are two tables that lay out the parallel growth of our investment in both the UR program and in faculty development. The URI budget still has the $618K operating budget that it started with, but now is supported by $416K from endowed funds. Faculty development still has the growing endowment under the direct management of the faculty, but an additional Chase Fund endowment supports SVPA scholarship initiatives, and a staffed Office of Academic Research supports sponsored programs that currently generate more than $2 million annually in grants and contracts. Norwich is committed to further nurturing the symbiotic relationship of these two tracks to scholarship with the goal continuing to achieve increasing student success.