

Boyer Model of Scholarship and the Impact of Reduced Load in the Scholarly Productivity of STEM Faculty in Master's L Institution

Vernaza, K. M.; Tallmadge, W.; Konieczko, E.; Sasi, S.; Lindley, L.; Vitolo, T.



Gannon University, Erie, PA



Introduction

Gannon University is a private, primarily undergraduate university with masters' programs in engineering, business and health professions. Faculty rank and tenure portfolios must demonstrate excellence in teaching, advising, scholarship, development and service. High teaching loads of 12 credits per semester leave minimal time for laboratory and field research which could lead to scholarly products in the STEM fields. Prior to AY 2003, the scholarly requirement of faculty was significantly lower than it is at the present time. Since the majority of female faculty hires in the STEM field have occurred since 2003, this has led to low numbers of female STEM faculty promoted to associate or full professors. The goal of one strategy of our NSF ADVANCE-PAID (2011-2016) is to retain and promote female faculty in the STEM fields by providing release time and research funds. This strategy is referred to as the Research Initiation Award (RIA).

Resources

Female faculty at the assistant and associate professor level can apply once each year for the RIA. One awardee is selected each year to receive the RIA which consists of three credits of release time per semester for two years and a total of \$7500 for research expenditures.

Each year about a dozen faculty qualified for the RIA. To date, four female STEM faculty members have received the RIA. Two additional female faculty have been supported with release time only. To date, two awardees have completed their two year project.

Progress

To quantify the impact of the RIA, a rubric based on the Boyer Model of Scholarship and the University's scholarship expectation was formulated. With the rubric, growth in research productivity can be assessed and used to validate the impact of RIA support on the recipient's research.

Results for the first awardee are shown in Table 1. The * is used to designate the years in which the awardee had the release time and funds from the RIA. Benchmark information is provided to show the impact of the release time on productivity.

Table 1. Productivity Awardee # 1

Category	Points for each item	AY* 13-14 Points	AY* 12-13 Points	AY 11-12 Points	AY 10-11 Points	AY 09-10 Points
Professional, Peer-reviewed & Communicated						
External Grants received larger than \$50,000	5					
Published International Journal articles / Book Chapters	5					
Published Articles; National or International Conference Paper/Proceedings	4	12	4			
External grants received less than \$50,000 but more than \$20,000	4					
External grants received less than \$20,000	3	6		6		
Research/poster presentations given at meetings/conferences	3	36	6			
Professional & Communicated						
Internal grants received	1		1	3	1	2
Mentoring student research grants	1		3	2	1	3
Non peer-reviewed (student or otherwise) oral/poster presentations	1	11	5	11	4	4
Total Points		65	19	22	6	9
% of work peer reviewed		83%	53%	27%	0%	0%

Additional benchmark data includes science faculty at the same rank who did not receive the RIA resources. Although the % of peer reviewed work is similar, the total points earned in scholarship increased significantly for the awardee. The most significant impact of the awardee's work has been the incorporation of undergraduate research students into her scholarship. In the two years of work, eight undergraduate students made enough progress on projects to result in either professional publication or presentation.

Table 2. Comparison of Awardee #1 with Colleague 1 and 2 Science Faculty w/o Award

	AY 13-14 Points	AY 12-13 Points	AY 11-12 Points	AY 10-11 Points	AY 09-10 Points	AY 08-09 Points
Total Points RIA awardee # 1	65*	19*	22	6	9	N/A
Total Points Colleague 1 w/o award	0	16	14	13	5	8
Total Points Colleague 2 w/o award	22	25	13	4	N/A	N/A

Table 3 shows the results from the analysis of the second awardee. The engineering department does have masters level students, and the faculty member typically taught nine credits each semester prior to the award rather than the twelve taught by science faculty. With the RIA, this faculty member increased collaborations with another researcher and graduate students, number of publications, and conference attendance.

Table 3. Productivity Awardee #2

Category	Points per item	AY* 14-15	AY* 13-14	AY 12-13	AY 11-12	AY 10-11
Professional, Peer-reviewed & Communicated						
External Grants received larger than \$50,000	5					
Published International Journal articles / Book Chapters	5	10		5		
Published Articles; National or International Conference Paper/Proceedings	4	20	12	4	12	8
External grants received less than \$50,000 but more than \$20,000	4					
External grants received less than \$20,000	3					
Research/poster presentations given at meetings/conferences	3	6	6	6	12	8
Professional & Communicated						
Internal grants received	1					
Mentoring student research grants	1					
Non peer-reviewed oral/poster presentations	1					
Total Points		36	18	16	24	16
% of work peer reviewed		100%	100%	100%	100%	100%

Summary of Impact

The NSF ADVANCE-PAID grant was used to apply successful strategies from large, research universities to our smaller, Master's L university to promote and retain female, STEM faculty.

Due to the heightened awareness, the University has made positive changes.

- Significantly increased the budget for internal faculty research and development grants.
- Redistributed release time credits across three colleges with preference to tenure-track faculty.
- Implemented in 2014 a formal application process for awarding of the release time.

This award demonstrated significant impact on

- Faculty publications, professional collaborations, conference attendance
- Undergraduate research participation and portfolios

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