



Impact Statement

Project Title: Evaluating the timing of interdisciplinary impacts at NCSU

Issue:

While the scientific and pedagogical advantages of interdisciplinary research are generally appreciated, there are a number of challenges in implementing and evaluating the relative impact of such efforts. As administrators increasingly look to analytical approaches that build on metrics like citation counts, grant funding awarded, etc. to aid in interpreting the impact of research efforts across campus, it is important to provide context for interdisciplinary efforts as compared to more disciplinary units. Resource decisions and accountability measure are increasingly reliant on such analytics, so expectations need to be grounded in evidence.

What has been done:

There are a number of ways to measure interdisciplinarity of publications and investigators using recently developed ontologies through knowledge bases, such as Web of Science (as used for this project). Their knowledge base provides the ability to pull together nearly complete records of an investigators publications, and the journals and articles referenced in each of these works. The degree of interdisciplinarity of investigators can be quantified from this rich data resource. This was performed for a number of interdisciplinary units on North Carolina State University's (NCSU) campus, particularly those related to the biological sciences (including the Bioinformatics Research Center, Comparative Medicine Institute, Center for Human Health and the Environment, etc.). These interdisciplinary units are comprised of faculty from a broad set of Colleges and Departments at the University. Additionally, these same metrics were collected for all faculty members from the more disciplinary-based Departmental units that are included in the investigator list for the interdisciplinary units. Based on the faculty members included on the membership lists of these units, the level of interdisciplinary for each investigator was calculated for each year between 2005 and 2017.

Next, data was collected to measure the impact of the research productivity for the same ten year time frame. Two important measures of productivity were collected. First, the overall citation count within the same time period was collected from Web of Science (an annual total). Additionally, the overall grant funding awarded within the same 10 years was collected using NCSU's internal Research Administration Data And Reporting (RADAR) database. Statistical analysis was performed to test the correlation between measure of interdisciplinarity of a faculty member and their impact as measured by both grant funding and citation counts. Interestingly, increasing impact across both impact measures was strongly associated with an overall increase in interdisciplinarity of the faculty member across the 12 year period, but the inverse was true on shorter time periods. Using proper statistical modeling approaches, the 3-5 year time period was the inflection point in where this trend reversed. Within 3 years, citation counts were higher for more traditional, disciplinary work, and after 3 years, citation counts were higher for more interdisciplinary faculty members. This trend continued through the time period evaluated. Within 5 years, research grant funds were higher for

more traditional, disciplinary work, and after 5 years, research grant funding was higher for more interdisciplinary faculty members.

Impacts/New Partnerships:

The results of this fit within similar studies, but helps quantify the long term impact of interdisciplinary research compared to more disciplinary work at NCSU. These results are not meant to value one type of research over the other, but to help ground expectations for the timeline and magnitude of the different types of research.

Outcome of Project (societal impact/ measure of increased quality of life)

This work will be presented to leadership, particularly in the interdisciplinary units on campus to help navigate and negotiate the timelines and other administrative and reporting expectations.

How has your project been aided by your FSLI experience?

The mentorship experience with our Provost was crucial to understand how such summary measures of impact are evaluated in overall administrative decisions.

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**If you have already written a report for your project and it is available on- line please include the link to the paper. If you have a pdf you can send it to us and we will include a link to that from your summary page.*