



Tracking and Forecasting the Impact of Strategic Investments in Research across Arts and Sciences

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“Starting with the larger questions we have begun to identify within the College’s strategic planning process, we are focusing on our mission in research and looking closely at where are best positioned to drive innovation and create knowledge.”

<http://as.virginia.edu/research-discovery>

Challenge: Predict and show relationships between investments and research in support of a College and Graduate School of Arts and Sciences (A&S) goal of being recognized as top public research higher education liberal arts institution of its kind in the United States.

Objective: Develop and track diverse, discipline-dependent indicators of research performance and forecast impact of strategic investments in research for UVA's College of Arts and Sciences and Graduate School of Arts and Sciences

How A&S might proceed:

Conduct Preliminary Research and Literature Review

Survey white papers, academic research, policy research. Ask other higher educational institutions and organizations about kinds of research performance indicators they have developed, how these were developed, and how the impact of research investments was or might be forecast. Examine research by and professional experience of organizations such as the Center for Measuring University Performance, and to the fields of program assessment, financial planning, investing, statistics and bibliometrics for theoretical and expert input. Be open to changing the process at this and subsequent stages based on feedback (see "Alternate Scenarios for Metrics" on p. 5).

Develop discipline-dependent indicators of research performance

First, have discussions and interviews with A&S leaders and leaders within each discipline to get thoughts and ideas. Second, survey disciplinary leaders asking them what would be top measurable indicators of research performance in their fields (e.g. # of papers published per faculty member per year, # of talks given per faculty member per year, # NSF grants, etc.) and to what extent and how in the next five years, they project these metrics would be impacted by the investments. The assumption here is that such individuals, most knowledgeable in their fields, might be the best developers and judges of appropriate metrics. The survey data could be captured in a database and analyzed. Based on the initial research, conversations, and survey, develop a pilot tracking system to measure progress.

Build or Use an Existing Tracking System? – Different Scenarios

Track the impact of investments at end of each year by requesting leaders in each discipline update their assessments in quantitative and qualitative terms (see below: “Forecasting and Tracking Impact”).

	Possible Advantages	Possible Disadvantages
<ul style="list-style-type: none">Utilize an existing, internal tracking system	<ul style="list-style-type: none">Greatest data security.Less work than creating system from scratch.	<ul style="list-style-type: none">Reliance on Computing/ITExisting systems might not be tailored to specific needs.
<ul style="list-style-type: none">Create a brand new system (e.g. a simple spreadsheet, with tabs by discipline).	<ul style="list-style-type: none">Tailored to taskLess data security	<ul style="list-style-type: none">Data securityTime investment
<ul style="list-style-type: none">A vendor or external organization	<ul style="list-style-type: none">Technical experience of vendorLow maintenance, internally	<ul style="list-style-type: none">ExpenseData hosted externally

Forecasting and Tracking Impact

The stewards and recipients of the investments (e.g. perhaps department chairs, institute heads, faculty) are closest to the research in their areas. Thus, one way to forecast impact might be for them, in cooperation with their colleagues, to project the impact both quantitatively and qualitatively; that is, using not only the metrics they develop, but, through incorporation of space within the tracking system, allow them to hypothesize counterfactuals; that is, ask them to imagine and ultimately record what would happen in the absence of the investments, even by individual metric, and write short narratives or stories of impact, by metric, since numbers alone will probably struggle to capture the causal process. These narratives might later be used as the basis of case studies, using images like photographs of the research, stories, interviews, etc. that could be shared with stakeholders such as donors, the Board of Visitors, and the public at large. These “thick descriptions” could be incorporated into A&S materials. A&S could change direction if needed especially after 1 or 2 years of pilot testing based on feedback on the process. Faculty are busy, so the system could be set up to minimize workload. Concepts of direct and indirect impact can be used.

Example

Physics receive \$500,000 in 2018-2019. The physics department chair discusses with the department, specifies a number of metrics (e.g. NSF grants, papers, equipment, funding attendance at conferences, course releases) that the funding afforded. The chair and research team write a brief description of what they project would happen in the absence of the investments. Each year they record progress by metric and write a description of how the investments/funds contributed to the research in the system. For example, in 2019-2020, the chair records that a faculty team was able to purchase a critical piece of equipment in 2018-19 without which a paper could not have been published and then records that this occurred in the system.

Alternate Scenarios for Metrics

- Standardized internal metrics might be explored. For example, creating standardized indices or scores. The advantage of such metrics could be comparability across departments and programs.
- Standardized external metrics could be looked into, also to benchmark against competitors (e.g. Duke, UNC Chapel Hill, Berkeley, Cornell, etc.).
- Some combination of the above (internal unique metrics, internal standardized metrics, external standardized metrics) could be examined.

References

<https://mup.asu.edu/sites/default/files/mup-2016-top-american-research-universities-annual-report.pdf>
<http://sif.virginia.edu/>
<http://as.virginia.edu/research-discovery>