Making Informed Hiring Decisions Using Data Analytics as a Support

White Paper — November 2014

Introduction

Most academic leaders agree that faculty are the lifeblood of any university. They attract students to the campus, mentor them through academic programs, and constitute the quality and strength of the university's research. Hiring and retaining the right faculty for the right program is critical to a university's success both as an academic institution and as a research institution.

Strategic hiring goes far beyond just replacing faculty and staff when positions open. Ideally, it uses data and analytics as a support tool to help identify specific areas where hiring particular faculty can have a major impact on driving the excellence of an academic unit. Not only can analytics support a university in its efforts to hire the right people, but having access to the data helps to inform department chairs, deans, provosts, presidents, vice presidents, and VPRs about the contributions of the faculty they have hired. When reviewed at regular intervals, it also helps identify opportunities to support retention and steps needed to address and keep valuable faculty and staff.

Academic Analytics offers solutions to support hiring and retention strategies by helping to identify hiring opportunities, demonstrate the impact of new hires, and monitor the progress of faculty and staff. This is driven by the powerful Academic Analytics Database (AAD), which includes information on approximately 220,000 faculty members associated with more than 9,000 Ph.D. programs and 11,000 departments at more than 385 universities in the United States and abroad.

The Hiring and Retention Decision Cycle

Historically, when universities have hired to fill vacancies left by faculty who have retired or moved on, the focus has been on finding someone with a similar research background.

Over the past decade, in an effort to save money, some university governing boards have pushed to hire less expensive assistant or associate professors to fill openings left by retiring full professors. Some have recommended deemphasizing or stepping away from research, leaving professors more time to focus on teaching students. While these short-term strategies can save money, they usually don't consider the long-term impact on the university and its programs.

Following a well-defined decision cycle focused on hiring and retention helps universities strategically identify gaps, hire the right people, and then monitor impact and retention issues. Academic Analytics has developed a five-step decision cycle (shown next column) that provides intelligence at every step to support an evidence-based culture.
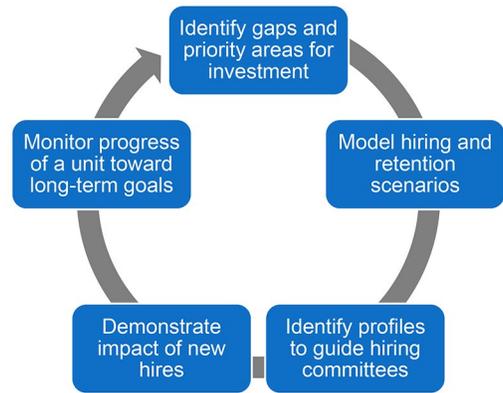

Step 1: Identify Gaps and Priority Areas for Investment

The first step in the hiring process is determining where to hire. This could be driven by a number of factors: increased enrollment in specific areas, a decision to build upon strong leadership or to build expertise in a particular academic unit, or even funding from federal or state initiatives.

University leaders generally have an idea of which units need investment. Academic Analytics provides tools that support decision-making efforts for the types of research candidates need to be considered to meet university and unit goals. The analysis is customizable, allowing visualization of a unit's research activity against the national comparative group, a group of selected peer institutions or standard peer groupings such as AAU public schools.

Box plot charts show a way to visualize the analysis of a unit's research activity today compared to other institutions. Leaders can see how they need to move research activity to meet goals, such as attracting top graduate students or attracting more research funding.
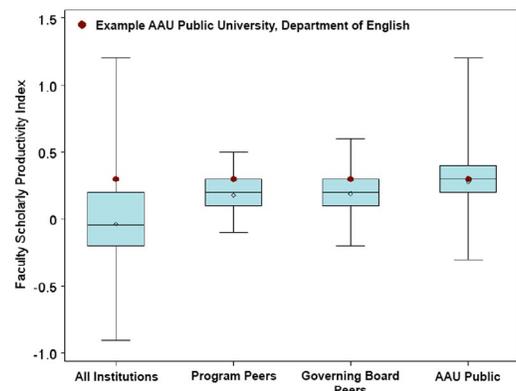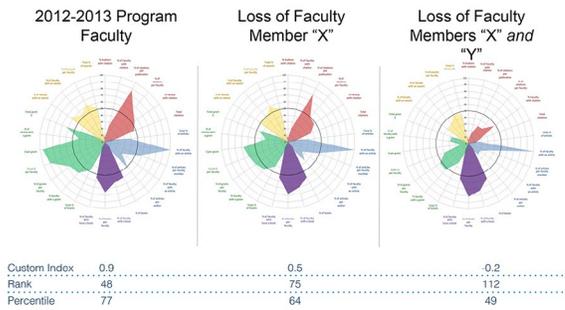
The Quintile Analysis ranks faculty research activity in one of five quintiles based on selected metrics such as citations, book and article publications, awards, and annual grant dollars. The breakdown of a unit's faculty into quintiles offers opportunity to better understand faculty and review potential staffing gaps. Some less research-active faculty could be junior researchers who have yet to establish themselves in the discipline. Conversely, professors who are nearing retirement and have curtailed their research activity may fall into a lower quintile, potentially indicating a need to hire replacement faculty.

Quintile	Average Citations	Average Articles	Average Awards	Average Books	Average Number of Grants	Average Annual Grant Dollars
1	115.92	9.76	1.16	2.78	1.98	$171,228
2	42.21	4.79	0.70	1.60	0.94	$61,948
3	12.10	2.49	0.65	1.46	0.54	$32,709
4	3.13	1.22	0.34	1.05	0.30	$14,921
5	0.50	0.36	0.15	0.21	0.20	$10,076

of candidates under consideration (senior, associate, or junior faculty) and can further view the analysis by peer sets. This can help committees understand where a candidate ranks against the wider backdrop of faculty in the desired discipline and university peer set.

Rank	Number of Faculty	Quintile	Average Citations	Average Articles	Average Awards	Average Books	Average Number of Grants	Average Annual Grant Dollars
Professor (2,224 total)	446	1	157.50	12.31	1.67	2.95	1.09	$111,535
	445	2	44.10	6.51	0.63	1.27	0.55	$78,802
	445	3	19.97	3.73	0.37	0.82	0.22	$27,881
	443	4	5.14	1.74	0.10	0.96	0.09	$9,426
	445	5	0.27	0.25	0.02	0.18	0.02	$2,136
Associate Professor (997 total)	200	1	90.22	7.54	0.68	0.26	0.56	$63,757
	197	2	26.55	4.78	0.16	0.19	0.18	$14,270
	202	3	9.93	2.47	0.04	0.15	0.08	$7,250
	195	4	1.97	0.88	0.04	0.23	0.03	$1,934
	203	5	0.00	0.00	0.00	0.00	0.00	$0
Assistant Professor (1,172 total)	235	1	56.02	6.26	0.36	0.13	0.31	$30,270
	235	2	13.70	3.07	0.05	0.03	0.07	$7,844
	232	3	5.07	1.56	0.03	0.03	0.05	$3,722
	153	4	0.50	0.84	0.07	0.14	0.05	$2,542
	317	5	0.00	0.00	0.00	0.00	0.00	$0

Step 2: Model Hiring and Retention Scenarios

What is the effect of attrition on to an academic unit and the university as a whole? Even before professors resign or retire, schools can use Academic Analytics tools to look at key research metrics and help determine the overall impact of attrition. "What if?" scenario models help guide academic units to understand the

2012-2013 Program Faculty   Loss of Faculty Member "X"   Loss of Faculty Members "X" and "Y"

Custom Index	0.9	0.5	-0.2
Rank	48	75	112
Percentile	77	64	49

impact of hiring various ranks and scholarly activity profiles.

Scenarios can be modeled and positioned against current metrics for the university, as well as against relevant peer sets. Department chairs, deans, and provosts can use these "What If" scenarios to see the impact of hiring a more research-active full professor or a less research-active associate professor, before even beginning the search process.

Step 3: Identify Profiles to Guide Hiring Committees

When it comes time to search for and hire new faculty, universities can use hiring profiles to guide hiring committees. Not only do hiring committees know whether they are looking for a professor, associate professor, or assistant professor, the Quintile Analysis also gives the committees insight into what constitutes a more research-active faculty member.
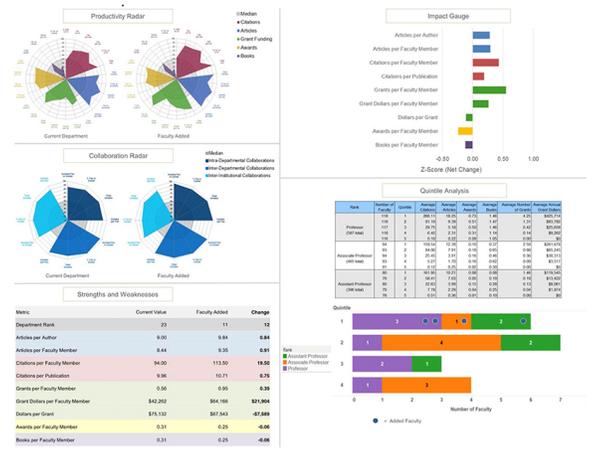
Using Academic Analytics' data, an academic unit can customize quintile views to include desired metrics—including citations, publications, awards, and annual grant dollars—across the discipline. Hiring committees can look at rankings for the types

Step 4: Demonstrate the Impact of New Hires

The hiring and retention cycle doesn't end when new faculty come to campus. To demonstrate accountability and receive future funding, academic units must establish the impact of those hires.


Units can again use Academic Analytics data as a support tool to help focus on the metrics and analytics that are most important to them. Research activity, collaboration, and research strengths and weaknesses can be analyzed to understand the impact of new faculty. An impact gauge allows the university to hone in on the net change, seeing how the faculty has affected the unit since coming on board.

When the Quintile Analysis is used, university leaders have the ability to identify the research attributes of faculty in the uppermost quintiles of a discipline and are more likely to identify and hire those candidates. By sharing the Quintile Analysis data and identifying these new hires, university leaders can send a message to governing boards that the institution doesn't just hire people to fill gaps; it hires faculty researchers at the top of their game relative to their faculty status.

Step 5: Monitor Progress of a Unit toward Long-Term Goals

Academic units that have brought in top faculty don't want to lose these researchers to other universities or see their careers stagnate. Deans, provosts, and department chairs want to guide their faculty, provide support, and help ensure they have strong careers.

Academic Analytics tools guide university leaders with the ability to see rising faculty research stars as well as the opportunitiy to support struggling struggling faculty through comparing the research activity of individual faculty to national norms. Universities can monitor faculty accomplishments and support educated, proactive decisions about retaining people and good investments to ensure continued career advancement.
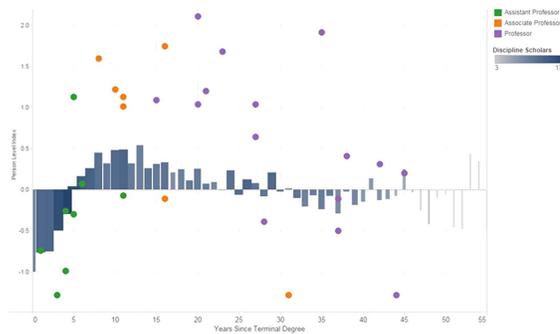
Being able to identify a rising star, like an assistant professor performing well beyond national and campus counterparts, provides department chairs with the ability to give that individual support—offering guidance through the tenure process and providing good retention packages—to ensure they stay with the university.

This view also identifies less research-active individuals, not just with respect to the discipline or academic rank, but in comparison to others with the same number of years since completion of their degree. Department leaders can use the data in conversations to better understand why these faculty members fall not just below the median, but below national averages. Investigation into these faculty members' progress may point to additional possible investments to help them get back on track; for example, a mentoring opportunity, a sabbatical, support from graduate students, or helping them become a co-Primary Investigator on a grant.

Guiding Funded Support

One of the contributions faculty make to an institution is overall research activity. First-rate research requires more than investment in top faculty. Funding is required to purchase equipment, hire staff to help run experiments, support time off to write journal articles, provide statistical analysis, and a multitude of other support functions. Funding for research projects typically comes from external sources. Hence, it is an institutional priority to identify funding sources and obtain support for research activity.

Prior to the introduction of the Academic Analytics database, universities often compared departments on campus to one another to view external research funding success. There were no national comparative solutions available. While there may be some value in that view, many disciplines do not enjoy the same

grant opportunities as others. Cross-campus comparisons tell an incomplete story at best.

For a complete picture, universities have the opportunity to see how an individual department or program is performing research compared to units in the same discipline at similar research institutions. Some broad program level information, such as STEM or Humanities comparisons, is available through the NSF (National Science Foundation). However, only Academic Analytics provides a complete, external comparative view at the individual department or program level.
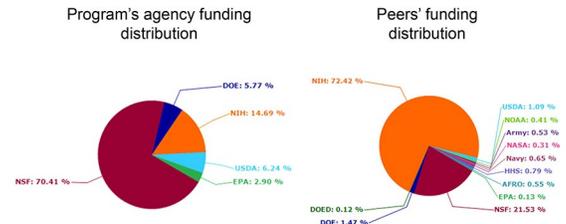
University leaders can use the Academic Analytics database to see a complete breakdown of funding for departments or programs on their campus and compare them to funding in peer units on peer campuses. Department chairs, deans, and provosts can see grant opportunities they may be missing, allowing them to dig deeper into potential funding resources. Further, peer sets can be constructed one school at a time, providing appropriate comparisons customized to the particular unit. For example, a biology department at a university without a medical school may not have the same funding opportunities as a similar department at a university with a medical school.

The Academic Analytics' Faculty Profile System draws upon the full constellation of research metrics attached to the individual faculty. This powerful new tool uses research-themed keywords to find individual faculty across the country doing research in related areas. Universities can identify research-active faculty in key areas and reach out to them for collaboration on grants, or look to them as potential mentors for junior staff, future hires, advisory board members, and other opportunities that can benefit the university.
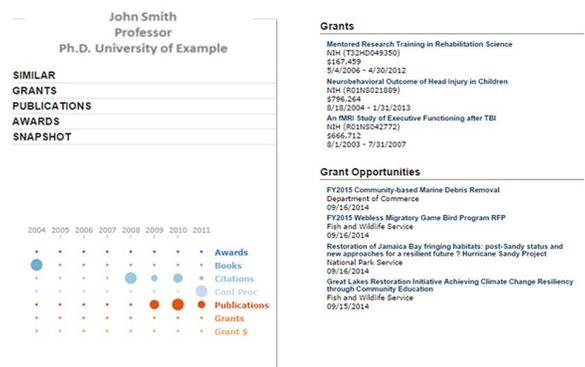
The profile also shows the grants on which the faculty member is listed as a Principal Investigator as well as grant opportunities currently available related to the research theme. Academic Analytics provides this information in real time, so the list of grants available for the faculty to pursue is up to date.

CASE STUDY: BAYLOR UNIVERSITY

Improving Graduate Education with Academic Analytics

When Larry Lyon became Graduate Dean at Baylor University, he recognized the need to improve graduate education at the school. He also needed to convince others that improvement was necessary, and he wanted to demonstrate improvement when it occurred.

He began by looking at GRE scores to see the impact of additional graduate stipend funding in his first year. When he saw no difference, he let the graduate program directors know that he was going to measure GREs each year and share this information across the university. He discovered that by measuring the GRE scores, they became important, and the graduate programs strived to improve this metric because it was being reviewed regularly.

Baylor began using Academic Analytics in 2002 to measure faculty scholarly productivity. Lyon recognized this productivity measurement as the single most important metric for a quality graduate program, but he also knew it was difficult to measure scholarly productivity.

"Without recognized scholars in your doctoral program, everything else doesn't really matter. Many will tell you that their programs are full of nationally known scholars. I doubted that this was always the case."
– Larry Lyon

Focusing on the strength of the humanities program, Baylor used tools from Academic Analytics to significantly improve the profile of their graduate faculty. Lyon was able to demonstrate which programs were populated by publishing, award-winning faculty, and which had fewer faculty with those credentials. By sharing these metrics across the university, over time, graduate departments began to improve hiring profiles and tenure standards.

Lyon also used Academic Analytics' tools to help graduate programs interested in launching a Ph.D. program see how far they had to go, and what level of faculty they needed to

hire, before they would have the research activity necessary for strong doctoral programs. This data also opened up frank discussions on finding the funding to bring in those scholars.

"One of the things Academic Analytics can do for us is take the graduate faculty we have now and show where they would rank, hypothetically, if they had a Ph.D. program now, based on the current number of articles and grant dollars and citations that the faculty have. Sometimes, it can be a rather bracing reality check."
– Larry Lyon

Since the introduction of Academic Analytics, Baylor has added 13 Ph.D. programs, now offering 27 total programs, and has strengthened the faculty profile of existing programs. Lyon generates a graph that shows the university's Ph.D. programs in the top half of all Ph.D. programs in the country. Since that first graph in 2002, the number of programs in the top 50% has increased over four fold. By using and sharing the measurement, and by allocating resources based on that measurement, other departments are seeing the benefits of making the list.

Baylor is also using Academic Analytics to focus on the need for more grants. The university is strong when it comes to publications, citations and awards, but the faculty aren't getting the same level of funding their peers are, even though the publishing numbers are similar. Not only is Baylor able to emphasize the need for funding, but Academic Analytics helps the university look at where peers in similar programs are getting grant dollars.

Lyon is excited for the future of Academic Analytics in graduate education. Based on the successes in humanities, Baylor is now using the tool with the STEM disciplines. The school also plans to take advantage of looking at the productivity of faculty members over time to better identify when they need to be proactive around retaining rising stars, as well as how to advise professors on the tenure track what additional activity they need to do in order to be at the level expected for tenure.

Conclusion

Hiring top research faculty is critical to the success of a university. Attracting funding so that faculty can do the research that allows them to stay at the top of their field is also a key to success.

Academic Analytics provides the resources that support deans, department chairs, VPR's, and provosts as they look to identify key areas of investment, and hire top faculty for those positions. Monitoring tools enable universities to nurture rising stars and help faculty who may be stalled in their career progression, enabling those faculty members to become top-ranked faculty in the school and among peer universities. Academic Analytics also offers tools that help universities identify what research grants are available, so they can pursue the funding that supports top faculty at the top of their field.