Understanding and recognizing excellence in lean times

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As budgets tighten and funding lags behind inflation rates, academia and governments are moving toward optimizing and standardizing research performance evaluation processes. This puts an emphasis on providing researchers with tools and information that improve their workflow efficiency. This article examines how the economy and other factors have influenced the research environment and how librarians can alter their roles to support researchers in the new reality of intense funding competition and multinational collaboration. It explores the emerging online applications that present data in an actionable way that not only helps researchers and research executives to chart their strategies, but also set and achieve their departmental and institutional long-term goals.

The dynamic nature of research versus a stagnant economy

Economic uncertainty has the capacity to slow research spending and investment to a crawl. Yet the nature of research itself is dynamic and is prone to adapt rather than stall. With these two forces at work, academia and governments are struggling with steering the direction of their research strategies from the funding stages to performance evaluations.

Asian ministries of science, technology and education are announcing that they will continue current research funding levels in spite of the economic climate. Even countries passing stimulus packages, like the United Kingdom and the United States, claim that this is not the time to reign in research funding. Prime Minister Gordon Brown is on record stating that the world must invest in the future and in basic research because innovation is the way out of the economic crisis. Such assurances imply stable budgets and free-flowing funding. But the reality is quite different.

Forty-three percent of American colleges and universities have implemented a partial hiring freeze and five percent, including Harvard, Michigan and Stanford, are under a full freeze. Since most public schools rely on state funds, the federal economic stimulus act may not impact their funding. Private institutions’ endowment funds are declining and Harvard is anticipating a 30 percent decline. With significant cuts across the board, widespread changes are imminent.

The new reality of research

Research is not immune to lean times. The reality is that lean times have brought about conditions for lean research. But lean does not mean less. Research simply adapts by optimizing its resources and systems to do more with less. But this requires understanding and building on the performance strengths of the institution. And it involves restructuring research processes to take full advantage of all current and potential resources.

Governments are responding by putting policies into effect that gauge performance in a different way. The HEFCE-sponsored Research Assessment Exercise (RAE) and the Excellence in Research for Australia (ERA) by the Australian Research Council assess research quality and allocate funds based on performance results. And academia is experiencing the consequences.

Approximately 15 UK universities receive less funding now than they did last year and roughly
54 institutions draw funding that is failing to keep pace with inflation rates. Institutions, including University College London, King’s College, Imperial College and Cambridge University, may be forced to make substantial cutbacks in response to the decreases set in motion by RAE-type government policies. Now more than ever, those involved at every level of research must be aware of the new assessment parameters in order to adjust their strategies to capitalize on strengths and minimize any weaknesses.

The RAE was developed as a world-class research and evaluation system that delivers precise metrics on which to base funding. But more importantly, it was designed to be a repeatable and transparent process. Uniformity and transparency are imperative to these evaluation policies if researchers and institutions are to be held accountable for their performance. Therefore, more data and better analytics are necessary to drive decisions throughout the workflows at every level, from the librarian and the researcher to the research executive.

An increased focus on effectiveness and efficiency

Though economic factors take precedence today, some of the elements contributing to the present state of lean research have been looming for over a decade. Governments have taken a larger role in assessment in order to better allocate funds. Competition for that funding has grown fierce and is becoming fiercer. Multidisciplinary research and collaboration have been encouraged to the point of requirement. These conditions increase the focus on effectiveness and efficiency to improve performance across all workflows.

Researchers spend 6.5 hours per week searching for and gathering information and 5.8 hours per week organizing and applying the information. The disparity between the time spent looking for information versus applying it suggests a disconnect in terms of how and where they invest resources.

On average, biomedical researchers receive their first National Institute of Health grant at the age of 42. The approval rate for National Science Foundation grant applications by new researchers is an abysmal 15 percent. Early career faculty face
greater obstacles than their more senior colleagues in securing research grants during what should be one of the most productive stages of their careers.1

The librarian’s role in improving the process

Improving the workflow process requires a clear understanding of what the inefficiencies are and the pinpointing of specific areas where information providers and librarians can partner in progressing toward the goal of reinforcing increased publication quality and funding awards. This helps boost institutional excellence and reputation.

Like researchers, librarians are being required to maximize their systems and resources against a backdrop of budget cuts. Information access, often considered a commodity, is affected and therefore reduced along with facility and staff expenses. But limited access to key information impairs an institution’s ability to view emerging research trends and strengths that could dramatically benefit researchers and the institution in the immediate and distant future.

Over the past 12 months, Elsevier conducted research of a group of 1,800 librarians, researchers, research managers and research executives (Deputy Vice Chancellors, Deans, Provosts and Vice Provosts). In relation to their individual workflow processes, the ‘trickle down’ theory is applicable because any inefficiency directly impacts the productivity of others down the line and, eventually, the organization as a whole.

One of the key challenges research executives face today is measuring, understanding and evaluating their organization’s performance. Is the strategic direction effective? Are we capitalizing on popular areas like stem cell research? Where should our research focus be? What are our distinctive competencies? How is our research portfolio performing? Much of their time and resources are spent answering these complex and difficult questions. And librarians are contending with how to provide them with the data to quickly and accurately assess the situation.

A constant flow of information regarding internal and comparative performance is needed and this requires a matrix of tools that link ranking, growth and development with research performance and strategy. However, this matrix of tools does not currently exist and traditional evaluation methods no longer give an accurate view of performance, emerging trends or how disciplines intertwine in today’s complex research environment. “Pinpointing new interdisciplinary themes is like looking for a needle in a haystack. We need to take the guesswork out of it”, explains a Director at the Office for Research.

Currently, journal-based classification assigns journals to categories, but the number and scope of journals is too limiting. It results in a risk of too few journals being included for analysis and brings the potential for English-speaking bias in journal selection. Also, science is categorized into a small number of fields and subfields, which results in a highly aggregated classification system with a limited view of performance data on the institutional or research laboratory level.

Replacing journal-based classification with co-citation mapping methodology

A new approach for identifying science literature is necessary to understand how various, and perhaps seemingly unrelated, disciplines are connecting. The National Science Foundation highlighted a mapping methodology using co-citation analysis and the concept is very different from journal-based classification. It looks at the quality of published output as well as the quantity. It also takes into account the multi-disciplinary areas of research, which is fundamental for assessing research today and its future direction. In one application of such a methodology, the whole landscape of science can be visualized in dynamic categories that are built up from over 84,000 sub-categories or subject paradigms.

In this mapping diagram (Figure 2), medical specialties and brain research are obvious distinctive competencies, but the mapping also exposes a deeper association with other dimensions. The mapping reveals the true competitors (who can potentially become collaborators), the number of subject paradigms driving a competency and the authors at the forefront of the field (who can then become recruitment candidates for the institution). Armed with this calibre of information, research executives can assess their return on research investments and governments can identify which institutions to target for funding specific research. “This could be highly useful in identifying collaborators for multi-institutional grants initiatives, which continue to increase in number”, states Art Ellis, Vice Chancellor for Research, University of California, San Diego.
By comparing the top 40 nations to each other on a country or regional basis (see Figure 3), changes are noticeable, opportunities are brought to light, strengths are validated and weaknesses are exposed. This mapping approach enables users to drill down to specific information on individual publications. In addition, it gives them insight into rapidly evolving research areas and the relationships among them. This data is essential for those charged with researching the new performance metrics and rankings, comparing their institute’s performance with competitors and potential collaborators and revamping research evaluation procedures.

Summary

In summary, the new reality of lean research brings about an increased focus on effectiveness and efficiency for everyone involved with scholarly research. To be lean, we need to take a closer look at each stage of the research workflow and identify improvement opportunities. As institutions face declining budgets and embark on the difficult task

Figure 2. Evaluating performance of today’s global research environment requires an astute understanding of the interaction among distinctive competencies and how resources are pulled between the various disciplines.

Figure 3. US strengths (transparent) are overlaid on the strengths (dark) from forty other nations.

of scaling back on investments, including library spend on information resources, progressive institutions are using this opportunity to adopt new performance intelligence tools that allow them to identify their current and future research strengths. By doing so, they can and will stay lean while elevating their standing and reputation among peers.

All this scrutiny surrounding workflow efficiency and effectiveness can be daunting for many, but it presents an opportunity for stakeholders, from librarians to research executives and publishers to information providers, to play a meaningful role in the new enterprise of global research.

References


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