Published on *American Council on Science and Health* (https://www.acsh.org)

Nudging University Research Frameworks into the 21st Century

By Stuart J. Smyth — October 26, 2017

Leverage. Leveraging. While these might seem like terms associated with Hollywood movies like "Wall Street", "Wall Street: Money Never Sleeps" or "The Wolf of Wall Street", the reality is that leveraging is an integral part of academic science and policy research in the 21st century. With fiscal demands upon governments at the state/provincial and federal levels having increased dramatically over the past 20-30 years, innovative strategies were needed to ensure that the public sector's high level of research (not to mention quality and importance) were not sacrificed.

So, what exactly has changed on university campuses? Fewer tweed jackets and tie-dyed t-shirts, but how has the structure of academic research changed? Have changes compromised research integrities? Questions of this nature are the important ones that have been asked and continue to be asked.

Historically, university research funding was entirely undertaken by government, government agencies or government funded, arms-length granting councils. This approach worked well when most scientists had small research laboratories with a few graduate and post-doctoral students contributing to specific research projects. One of the predominant reasons for this structure to change was driven by information and technology communication (ITC) advancements. Where previously, leading academic scientists would compete against each other through a grant process, the ability to use computers allowed leading academics to partner on a grant proposal, increasing the scope and scale of the proposed research.

Very quickly, the size of a large research grant proposal went from six figures to eight. Thirty years ago, a grant of $200,000 or $300,000 was a significant grant that would allow a research laboratory to be adequately funded for several year. Fifteen years later, this amount of money

would be enough to fund three months of research as grant requests grew to be in excess of $10,000,000. Today, grants reaching into the $20, $30 and even $40 million dollar range, over five to seven years, are increasingly common.

The change in the dynamics of research grant proposals has been substantially impacted by ITC innovations as the ability to form a research network of leading academics at various universities is now the norm. The ability to connect academics, scientists and laboratories via ITC advancements has resulted in a research environment where several of the leading researchers within a particular discipline now collaborate in developing research proposals and conducting the research.

A parallel driver to this redesign of funding research frameworks has been driven by the granting agencies themselves. As governments grappled with the rapidly increasing fiscal demands of baby boomer populations approaching retirement age, greater investment increases into health and public services were required. Some politicians viewed research funding as an evident source from which to reallocate funds. As granting councils faced increased competition for federal fiscal resources, it was realized that to be able to continue funding the existing levels of research, let alone the ability to increase research funding opportunities, innovative strategies would be required.

While some grant proposals had previously required private sector contributions, either cash or in-kind, around the turn of the millennium, this changed dramatically. At this time, research proposal calls from granting agencies required increased levels of matching industry funding, ranging from 25% to 60%. Leveraging federal research contributions allowed granting agencies to effectively double the amount of research that could be funded through any call for research proposals.

The effect of this has been to push academic research further downstream in terms of commercial potential. While there are still funds available to academics to engage in research impartial to private funding, known as ‘bluesky’ research, funding for these initiatives has decreased. Partnering with the private sector has changed the design of research proposals to be more specifically focused on private industry problems and research designed to overcome or reduce these problems. To a large extent this is a natural evolution of the impact that the ITC revolution has had on academic research. The ability of academics and industry to collaborate to respond to real world problems is evident for example in research such as the rapid responses to disease outbreaks like Zika.

The issue of research integrity is an important one and universities have taken numerous steps to ensure that academic freedom is the top priority for any public-private research partnership. When a successful grant is awarded with matching private sector funding contributions, complex and detailed contracts are prepared and signed by all organizations that are a partner to the grant. These legal agreements include details on how intellectual property will be shared or protected, how materials can be transferred between laboratories and how fiscal contributions will be made to the specific university. These contracts ensure that private sector firms do not have the ability to change or influence research results that may not be to their liking or interests. Predominantly, these are agreements between institutions.

As a nature, academics never directly receive matching industry contributions directly into their

research programs, the contributions are made to the university and the funds are allocated to a specific grant that is then monitored and reported on by the specific university's financial reporting department. These reports are provided on an annual or semi-annual basis to the granting agency.

At the end of the day, more research is being done, by more leading researchers, in more universities than was possible under the previous framework. The benefits of this are new products, technologies and drugs for society. Frequently the research leads to the establishment of new companies, creating new employment opportunities. High quality research attracts high quality scientists, resulting in improved student learning opportunities.

Protocols have been implemented to ensure that academic research freedoms are an integral part of this interactive research partnership. Innovations within both ITC and granting agencies have provided substantial social benefits from the increased level of research being conducted at campus' across the nation. While society reaps the vast majority of the benefits of the research results, benefits must exist for the private firms and the public universities to ensure that this vital aspect of innovation research continues to be the backbone of how university research is conducted in the 21st century.

This article appeared in the Fall 2017 print edition of Priorities magazine [1].
