Seven Success Factors for Maximizing the Sustainability of an Academic Research Enterprise

Research and education are considered to be the major thrusts of an academic institution. Education—specifically in the context of undergraduate studentship—is often the primary financial driver. High quality research on the other hand can greatly enhance the credibility of an institution as a leading knowledge authority. The maintenance and sustainability of an academic research enterprise (both financially and reputationally) is greatly contingent on its ability to attract and secure funding from external sources. Below we highlight several underlying success factors to maximize this outcome.

1 *Understanding and navigating emerging funder expectations* — The range of possible external funding sources for research has always extended beyond public grant programs to include philanthropy and industry. The parameters that govern the private sector funding landscape are however beginning to change. For instance, donors and foundations are increasingly tying their investments to specific research outcomes and even scientific milestones. Industry partners are also requiring a more well-defined value proposition (better, faster, cheaper), stringent standards of work and a risk-reduced research plan before engaging with academia. To continue to tap into these funds, institutions and researchers must navigate this new terrain delicately, balancing intellectual curiosity and academic freedom with funder requirements, without compromising the quality and independence of their research programs.

2 *Developing a systematic evaluation practice* — It is critical that resources and time are dedicated to frequent, standardized evaluation of an institution's research portfolio (or its flagship programs), gauging the intensity of activities, the degree of outputs as well as the impact of the work, in order to pre-emptively reveal gaps and validate areas of leadership in relation to other comparator programs and organizations. This practice minimizes institutional blind spots and provides real-time competitive intelligence to drive strategic planning and resourcing.

3 *Horizon scanning* — For a research enterprise, intentional focus (for instance around an area of historic strength) is an important success factor but so is an ability to strategically pivot, divest or expand. Fostering dedicated horizon scanning capabilities allows the institution to keep abreast of emerging research trends, barriers and opportunities and to maintain its relevance and competitiveness by repositioning itself in a timely, concerted and informed fashion.

4 *Coupling research and undergraduate education* — It makes intuitive sense that research strengths and accomplishments be positioned to actively boost the institution's brand and visibility with its prime customers, undergraduate students. At the same time, undergraduates are often enthusiastic and willing to contribute to science and maximize their opportunities for hands-on experiential learning through research. Institutions should thus aim to maximize opportunities for immersing research into undergraduate teaching. Additionally, resources should be strategically deployed toward the development and delivery of cutting-edge undergraduate courses that relay and showcase the institution's leading contributions to a field of knowledge.

5 *Making a place for purpose-driven research* — Supporting research that is specifically designed to generate solutions is an important and necessary branch of work. In a recent article in the Globe and Mail, Douglas Barber and Ishwar K. Puri (engineering professors at McMaster University) note that "last year, major universities in Canada spent about $7 billion on research but the amount of licensing revenue their research earned was only about $80 million, barely 1% of research spending. In the US, by comparison, licensing revenue represents about 5% of research investments." To fully capitalize on this revenue opportunity, it is important that institutions encourage the development of purpose-driven research programs and at the same time set up feasible models and streamlined tech transfer services that can effectively bring inventions to the marketplace (and generate research ROIs) without diluting or re-directing research resources toward commercial activities.

6 *Bringing research into everyday life* — To sustain and elevate their research enterprise, it is important that institutions commit to breaking down the walls between academia and the general public. This is not about effective or prolific promotion of research programs but rather about a genuine sense of responsibility to educate, include and guide all members of society to collectively understand and advance the world. In the health research space, this can mean the creation of intentional frameworks for engaging patients in the research process, not just as clinical trial participants but as contributors to

our understanding of basic human biology and disease. A great example is the system at Vanderbilt University Medical Centre, which is set up to enrol every patient that attends the hospital for medical purposes into a data repository and sample biobank that fuels its core research programs. The geographically-distributed power of citizen scientists can also be harnessed to conduct large-scale environmental research and everyday people can be solicited to serve on boards or contribute to the conceptual direction of solution-focused research programs. This deeper connectivity with the public improves the fundability and resonance of research programs with governments and philanthropists. It also helps institutions to retain and build the next generation of researchers as it allows students to see the value of their work and connect their research with real world issues and impact early in their careers.

7 **_Fostering convergence_** — In order to address the big challenges of our times, institutions must encourage researchers of different backgrounds to come together in open-minded collaborative teams, carving multi-dimensional and sometimes entirely novel ways of generating knowledge and solutions. Institutions can catalyze this convergence by investing in the development of truly integrative and inclusive platforms (e.g. data science), lowering the barriers for researchers to access these state-of-the-art resources and providing specialized funding for transdisciplinary projects that are aligned with the institution's areas of strategic focus.