CHAPTER 10

Global Research Questions and Institutional Research Strategies

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INTRODUCTION

Two years ago, one of the authors (PJP) was at a conference in Seoul on "The Role and Responsibilities of Research Universities", moderating a session on "Higher Education and Strategic Knowledge Creation". It was an intensive session, with ten papers, in which university presidents and senior academic officers from around the world spoke about research projects and knowledge transfer. In the discussion afterwards, the vice-president of National Tsing Hua University in Taiwan, Da Hsuang Feng, stood up and said: "You know, all these [glittering technologies] are irrelevant"; he continued: "Every single day we are given three grids: water grid, sewage grid and electric grid. Imagine we don't have one of them on any single day. Life would be hell. Then I realized a large percentage of the world of people doesn't have at least one of them, and some don't have three of them… So, as research universities, should we not think about that? … we have a global warming problem. It's real… water shortage is real… Energy shortage… Disease… Finally, human hatred. Shouldn't research universities think about those issues… My gut feeling is that if universities are not going to do it, then nobody will. Governments are not going to do it and corporations are not going to do it." (*International Presidential Forum on Global Research Universities*, 2013, p. 157)

It was a provocative intervention, coming as it did at the end of a celebratory session of academic achievement. It struck a chord. People stood up

to say that universities should aim to make a direct contribution to tackling some of the great problems facing our world. Such crucial research may never even get off the ground if university research is driven only by the research priorities of individual academics. But it was the end of a very long day, the session was closing, and the discussion went no further.

Back in Dublin, that passionate intervention continued to echo. Those three grids resonated, perhaps because delivering water, sewage treatment and electricity is part of what engineers do, but also because Da Hsuang Feng is right: without those three grids being available every single day, life for many of us would be impossible.

Today, the greatest challenges facing our globalized world are to protect human rights, overcome poverty, disease and exclusion, and achieve self-determination. But we also face global challenges that previous generations did not have to consider, perhaps most urgently, the need to maintain a liveable planet; other challenges include the migration of populations between continents; the mass collection of data on individuals and how that is used; and the rapid development of technology and our tenuous ability to control it. What is different now is that while our predecessors could justifiably claim a degree of ignorance about the effects of these changes, today the extreme connectedness of our modern world means we can no longer fail to recognize the significance of such global issues for the lives of individuals, or fail to fully appreciate their impact on human dignity.

More to the point, over the last 300 years, a new understanding of health and new technological capabilities and forms of social organization have permitted many countries to attain a massive improvement in living standards characterized by adequate food, shelter, clean water, education, good health and enough income to live with dignity. However, despite all we have achieved, many societies remain mired in extreme poverty and deprivation. At the same time, more economically developed communities are just beginning to understand the implications of diminishing natural resources, and other phenomena allied to technological development such as the ubiquitous availability of personal information.

We need to improve our understanding of "emerging communities" in order to explore the sources and dynamics of their success, as well as to understand the major development challenges they continue to face. Their fast growth raises new questions about the development of nationhood and identity, the relationship between health and poverty, and the promotion of sustainable, equitable and environmentally acceptable growth. Different parts of the world provide vital learning for other parts; universities, with their networks of students and staff, can ensure a better understanding of those regions of the world that will inevitably become the cultural, economic, political and social powerhouses of the 21st century. These are just some of the most important

challenges we face; as universities, we have the freedom and the capacity to ask the important global questions that will begin to explore these challenges and point towards solutions. Such questions include:

- What can communities do to attain levels of human well-being that we know are achievable?
- How do we reshape research and education to create an equitable future for all?
- How do we make nature and technology work as one?
- Why does poverty become destiny, and how can that be changed?
- How do we bring emerging societies onto the grid?
- How will we sustain a liveable planet?

The concept of developing global research questions seems at first "topical" or even populist, but this is not the case. Poverty, inequality, disease, hunger and corruption, and the moral dilemmas that underpin their origins have always been with us and perhaps may always remain with us. Nonetheless, down the ages university scholars have used their academic freedom to provide intellectual and ideological leadership in the consideration of these challenges; their efforts have resulted in societal change, improving the ability of people to act in pursuit of their own ends and participate socially and politically.

Trinity College has a tradition of addressing the most important and pressing questions facing society. In 1729, Jonathan Swift, who attended Trinity between 1682 and 1686, wrote *A Modest Proposal* (Swift, 1729), his satirical response to the failure of intellectual elites to address the appalling conditions facing the poor.

Despite the enormous strides that mankind has made in combating war, injustice, hunger and poverty, these horrors remain a significant threat to the integrity of states and emerging societies; the imperative for universities to provide leadership and to work together to make an impact upon these challenges and create solutions to them has never been greater. The great political philosopher and Trinity graduate Edmund Burke said: "No moral questions are ever abstract questions." So we must understand that the global challenges and the questions we must ask to address them are not abstract or slow-burning, but real and urgent, deserving of our *special* attention and efforts. Neither are these challenges ephemeral, being as they are the inevitable consequence of unstoppable globalization.

GLOBAL RESEARCH QUESTIONS AND INSTITUTIONAL STRATEGIC PLANNING

Following the Seoul conference, the authors started work on Trinity College Dublin's Strategic Plan for 2014-2019, which was published last October. We have now inserted into this Plan the objective that Trinity address a Global

Research Question — or a GRQ, as we rather optimistically refer to it, in the hope that the idea of universities addressing global research questions gathers such currency that we can start using acronyms.

Many universities have indeed recognized the importance of addressing global challenges; in this regard other universities are ahead of us, and U.S. universities are leading the way though they have yet to formulate GRQs. For example, Georgetown University has a "Global Futures Initiative" which "involves inviting members of the Georgetown community to undertake innovative teaching, research and dialogue with world leaders in the public sector, business and civil society around pressing global issues" including development, governance and the environment (Georgetown University, 2015). The President of Georgetown, John G. DeGioia, has spoken of universities' "special responsibility to address the global challenges that will shape humanity's future". The Earth Institute in Columbia University focuses on "environmental challenges — from rapid population growth and climate change to extreme poverty and infectious disease" (Columbia University, 2015). While it is too early to speak of a groundswell, there are now enough targeted initiatives to enable us to speak tentatively of a growing movement within universities discussing these issues, engaging in informed advocacy at the highest level in international forums, and setting up targeted collaborations in areas where an impact can be made. Important as these activities are, they have not been mainstreamed into the fundamental work of the academy; they are identifiable because they stand apart from the main thrusts of research questions posed by academics.

In drawing up Trinity's Strategic Plan, we did not identify what our GRQ would be, and we still have not identified it, although we intend to do so within the 2015/16 academic year. It is, we admit frankly, a work in progress. As a university, we wanted to put the idea of a GRQ in the Strategic Plan to get the ball rolling, but we did not, and do not, underestimate the disciplinary and structural challenges facing universities addressing GRQs (Trinity College Dublin, 2014).

Our purpose with this paper is to share some of our current thinking, and to present some ideas that will enable an exchange of views about strategizing for collaborations on GRQs in research-intensive universities.

DEFINING THE GLOBAL RESEARCH QUESTION

Defining what we mean by a global research question is not hard: such a question addresses fundamental challenges that affect the future of the planet. A GRQ addresses an issue that has emerged across the globe, at scale, that cannot be solved by a single discipline or within a single country. Therefore, GRQs are interdisciplinary *and* of global consequence: water shortage, energy

provision, climate change, poverty, global warming, migration, inequality, the ageing population, conflict resolution — all these challenges to humanity are the basis for GRQs.

To further particularize, we might ask what areas of research *do not* qualify as GRQs Very little of the research done in universities qualifies as a GRQ. In Trinity we have excellent research institutes in neuroscience, nanotechnology and digital humanities, and we are planning a cancer institute. None of these concentrates on what we mean by a GRQ. Cancer is potentially a tragedy for individuals, particularly if they are young, and it is something we all fear, but cancer research is not a GRQ even though it is utterly essential for individual lives that we find a cure for cancer. However, other diseases have the potential to decimate regions and communities and, if not solved, could wipe them out, eventually affecting the planet itself. This potential to have a global consequence characterizes a GRQ.

THE CHALLENGES OF ADDRESSING GLOBAL RESEARCH QUESTIONS

The disciplinary challenge

Given how crucial GRQs are, why do universities not concentrate on them? Why do we not all have Climate Change Institutes, Migration Institutes, Inequality Institutes? The answer is that when it comes to research areas, universities tend to converge. Trinity College Dublin is not unique in its research institutes: neuroscience, nanotechnology, biosciences, cancer. There are counterparts of these all around the world. There are good reasons for this. These are genuinely important areas — just because they are not GRQs does not mean they do not need our attention. They are exciting areas where new discoveries are being made all the time, and where individual scientists lead active research teams.

This thought prompts another question: are GRQs intrinsically less exciting than subjects such as nanotechnology or digital humanities? Is that why universities avoid them? This is probably not the answer. Universities can only approach research questions that are in their remit to solve — research questions that are, if you like, "sized" appropriately for the resources available.

In addition, topics of research become exciting when communities around the world are concentrating on them. The global support systems built around, say, bioengineering or cancer or Joyce studies, enable researchers to get funding and find collaborators through these networks. Areas of research that already have momentum are attractive for researchers — perhaps this is one constraint holding back the pursuit of GRQs. Thoughts about another constraint are triggered by recalling Winston Churchill's famous remarks in

the House of Commons in 1922 on the Northern Irish conflict: "Then came the Great War… Great empires have been overturned. The whole map of Europe has been changed… but as the deluge subsides and the waters fall short, we see the dreary steeples of Fermanagh and Tyrone emerging once again. The integrity of their quarrel is one of the few institutions that has been unaltered in the cataclysm which has swept the world." (Churchill, 1939). When Northern Ireland erupted again, in 1969, after five quiet decades, there was a lot of talk about the "dreary steeples of Fermanagh and Tyrone". This catches something about our attitude to the very problems that lie behind GRQs — they can appear long drawn out, unvarying and intractable.

The GRQs — of conflict, migration, inequality — are topical now, and they have always been topical. Is it for that reason that they may be less intrinsically interesting than the hot topics of the day? Do university researchers and students stay away from these questions because, instead of promising the excitement of discovery, they induce feelings of exhaustion, and even of irritation? In addition, many of these issues are highly political. Research requires donors and funding, and certain types of research will always prove particularly appealing while others fail to attract support.

The structural challenges

When presidents of universities meet and talk about collaborating, they tend to talk about student exchanges and joint programs in teaching. They do not talk so much about research collaborations because they rely on individual faculty members to set up the projects and links that will grow their research. They do not talk about GRQs much either, or about sharing resources and expertise to address the kinds of problems mentioned above.

This is not — we hope — because university presidents do not care. It is because the way that academic research is structured and funded does not facilitate strategic planning and direction from the top; instead, there is a bottom-up approach. Universities create research strengths through the efforts of individual faculty members, and the outputs are those that materially affect the advancement of the individual researcher's career, notably publication of highly-cited journal articles or books with prestigious publishers. Let us look at this in some more detail.

Universities empower individual faculty members. This is institutionalized by individual Principal Investigator (PI) grants. Getting such grants is the *sine qua non* for promotion, and individual PIs build up a track record which is the marker of success. Incentivizing individual effort is the bedrock of the strategy in research-intensive universities, and it is rooted in the academic freedom which is so precious to research universities, including our own (Trinity College Dublin, 2011).

Drawing on this bedrock of individual achievement, how do universities strategize for research? There are some very successful institutions whose strategy is stated as (and we paraphrase): "Hire the best people and let them get on with it." Of course, this statement is a strategy in itself: what is "best"? And what are researchers supposed to "get on with"? Notwithstanding therefore that some universities may not explicitly write out a research strategy, all have strategies.

The universities obliged to write out an institutional research strategy generally proceed in the following way: (i) do an audit of research activities, (ii) identify strengths, (iii) link the strengths together into multidisciplinary themes, (iv) assess the themes based on external peer review, and (v) assign the best themes as strategic priorities for preferential recruitment and philanthropic support. Often these strengths can be structured into research institutes that are funded separately from the budget that supports teaching. This is the bottom-up approach and it is relatively democratic. This approach also has the appeal of supporting individual academic freedoms; indeed, the "strategy-less" approach is individualistic *in extremis*.

However successful these approaches based around individual PIs may be, they are open to criticism as wasteful of the world's intellectual resources in the face of serious and mounting global problems. The individualistic approach atomises research questions into individual packages, and the university then tries to create scale by aggregating individual efforts. There is much to say in this approach's favour: it promotes individual responsibility, and it is the individual who is promoted, rarely a group. It also stimulates output of the kind measured by rankings and is therefore the bedrock of research universities, including our own. However, the approach results in the strikingly similar research prioritizations already mentioned — the fact that many of our universities have cancer institutes, nanotechnology and neuroscience institutes, and so on, is evidence of this.

Indeed, there is strength in numbers, and it is a great thing for Trinity researchers that they can find peers around the world to collaborate with. But, while much research in the same field is complementary, much is also — and let's be frank here — duplicated. That is what might appear to be wasteful. In an ideal world, if our research were genuinely global, there would be greater complementarity and less of a herd instinct when it comes to defining research questions.

SOLUTIONS: A FOUR-PRONGED APPROACH

What do we do? The bottom-up approach to research strategizing based on individual researcher priorities does not facilitate GRQs; research coming bottom-up tends to flow along existing grooves (there is a reason why we talk about funding "streams"). Creating new grooves is no easy task, and could

prove disadvantageous to successful universities. Why then take the risk to change if already in a strong position?

We don't have all the answers. But we suggest a four-pronged approach:

Get agreement on the necessity for GRQs

As research universities we employ the vast majority of the world's researchers across a diverse array of fields; we should reach an agreement that, without some degree of coordinated response, it will be difficult to come together to collaborate to address GRQs. This agreement may not be easy to achieve. Some universities may prefer to stay within the status quo, which is working for them. We need to test the appetite for GRQs. We are hoping that it is strong, because this is not an area where a single university can go it alone. It is encouraging that Columbia has an Earth Institute, and Georgetown has a Global Futures Initiative, and Trinity has a Global Research Question (though it has yet to be specified). These do raise the profile of global challenges, but a single institution is unlikely to have the breadth of activities or the global presence to marshal the academic resources needed to solve a GRQ on its own. If we are dealing with global issues, requiring coordinated inter-disciplinary, inter-institutional and international responses, then all the world's leading universities should engage.

Redefine what 'exciting' means when it comes to research

Academics do the research they are personally interested in, and so they should. But what is considered exciting can be subject to change. One of the most exciting, certainly the most headline-making, books published in the last few years is, of course, Thomas Piketty's *Capital in the Twenty-First Century*. It deals with inequality, and he has created huge excitement around this area — an excitement which universities could harness. The people who try to solve some of the world's more intractable global challenges are mostly outside academia, whether it be in conflict resolution, climate change or inequality. At some point during the many years these individuals give to these issues they may grow weary, but when breakthroughs are made their efforts are rewarded manyfold. We are inclined to admire noble, inspirational leaders. That admiration could be harnessed by universities to encourage researchers to solve these global challenges by formulating GRQs that are amenable to collaborative research within the academy.

Accelerate inter-disciplinarity and extend 'translational' research

We have been concentrating on the structural set-ups that work against GRQs, but there are also benefits to the way universities and funding have developed,

which could facilitate GRQs. We are thinking first of all of the move towards inter-disciplinarity. Universities now routinely offer programmes in areas such as creative studies, entrepreneurship, multimedia and innovation which demand an interdisciplinary approach and which were not being offered a generation ago. And new interdisciplinary fields, such as bioengineering, neuroscience or deaf studies, continue to be synthesized from older disciplines.

Universities have also succeeded in pioneering translational research, which has been led by Academic Medical Centres. Such translational research is often said to be "from bench to bedside". If we extend this thinking across other fields, then research questions may be formulated around matters that link up with fundamental science at one end of the spectrum and with actual practice at the other. This extends the idea of what complex research actually is. Certainly it is arguable that there may be matters that are more pressing if not more important than fundamental research. In a paper entitled "The Post-Scientific Society", Christopher T. Hill (2007) argued that we are moving away from a focus on "fundamental research in the natural sciences and engineering [towards] world-leading mastery of the creative powers of, and the basic sciences of, human beings, their societies and their cultures". As a result, we could become a society in which successful research depends not on the ability to specialize but rather on the ability to synthesize and design. We cannot address GRQs without inter-disciplinarity and a "translational" attitude to research.

Incentivize an extended range of university activities

Universities such as our own are clear about their mission in education and research, with research-led teaching being an unbreakable link between the two activities. However, in addition to teaching and research, universities now have an extended range of "tools" at their disposal, for example, company incubation, provision of creative spaces such as arts venues; alumni networks, and so on; it is clear that these activities help to address GRQs. Since GRQs are global, we need to go beyond the merely national frameworks currently in place; a global dimension to funding would further help to prioritize global issues. This is happening with global foundations, but public funding is also required and this too is starting to be granted. One example is the European Institute for Innovation and Technology, the EIT. The EIT has created pan-European groups called Knowledge and Innovation Communities, or KICs, which coordinate partners from three sectors: higher education, research and business. There are five KICs currently under way:

- Climate
- ICT
- InnoEnergy

- Raw Materials, and
- Healthy Living and Active Ageing.

Climate and Energy are GRQs, as is Active Ageing — the European Parliament made a deliberate choice to concentrate on these areas of significance to the future of humankind, where entrepreunerial solutions needed to be boosted. The first three KICs — Climate, ICT and InnoEnergy — have already delivered impressive results in terms of start-ups (205), new and improved products/services (280), knowledge transfers (558), and graduates (1028) (Prendergast, 2015). All this is very promising because the way that universities will help to address global challenges in the 21st century is precisely through extending the range of university activities to spin-out companies and the not-for-profit sector.

One of the authors (PJP) is on the EIT board and is delighted to be associated with an institute which is taking seriously the challenge of addressing complex issues not usually seen as suitable topics for university research activities. Without making huge claims for the EIT, the incentive it provides — a very well-funded one — is greatly to be welcomed. The EIT also uses public funding to kick-start activities that may, after this public investment, attract the interest of entrepreneurs and the business community. Without the ultimate interest of private organizations, GRQs will not be solved.

Over the next few years, much will happen in any event as global challenges are too important to be ignored, so that addressing them — whether by formulating GRQs or not — is inevitable. However, we should not wait until the incongruity of research universities not playing a visible part in addressing global challenges becomes apparent. We should help to move towards a situation where GRQs are considered the routine activity of any leading university.

DISCUSSION AND CONCLUSION

It is understandable that universities avoid defining a single GRQ which would be too big, intractable and unanswerable. Such a GRQ would be a constraint for individual researchers and would present too major a change in objectives for established research institutions: how would it be measured and funded? Instead, we formulate multiple questions and sub-questions and objectives, each relevant in its own way but also easily aligned with stated research priorities, themes and sub-themes of research funders. There is something in there for everyone, each step incrementally measureable in terms of achieving critical mass, output and metrics.

This is the long-established, predictable and sensible ground-up approach imposed upon the university system by good sense, economic direction,

funding constraints and rankings. We are not suggesting that we abandon it, but we are suggesting that if we still believe that universities can actually change the world, then we must move beyond the conventional approach as our only way of finding answers to the most important issues of our time.

Global challenges and their effects cannot be addressed merely by hoping that they somehow enter the provenance of individual academic interest; rather, putting GRQs on the agenda needs our explicit support if the questions are to become the focus of teams of academic researchers working smoothly across many disciplines in the arts, sciences, law, social sciences, technology and the health sciences. A new kind of global interdisciplinary collaboration needs to be promoted.

In preparing this paper, we read the second Glion declaration published in 2009. The declaration reflected upon the impending second decade of the millennium. It stated:

"It is… clear that 'business as usual', a casual continuation of our present patterns and current practices, is not sustainable in the longer term, at least, not without growing hunger, disruption and social dislocation." (Glion Colloquium, 2009).

That declaration was a call to action, for research universities to adopt new approaches of such boldness that they would be "disruptive of much conventional thinking and many established practices". It would seem that as we enter the second half of that decade, hunger, poverty and social isolation continue unabated and the need for research universities to take up the most pressing challenges and find new ways to address them has never been greater. If the universities will not take up the challenge who will? As leaders of research universities have often said, it is within these institutions that the leaders and intellectuals of the next generations are shaped, the frontiers of knowledge crossed and partnerships that can achieve greater than the sum of parts created. We have the opportunity, the ability and the academic responsibility to define the most important global research questions of our time. We must grasp that chance so that we can identify the inventions, the art and the actions that will forge a collective and equitable future. We think we have an obligation to do this; although obligation can be a rather off-putting concept, we also think that ultimately universities will derive great inspiration from meeting the challenge.

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