UNIVERSITY OF OXFORD

Oxford Summit: how universities, industry and governments can help post-pandemic recovery and growth

In an event held at the University of Oxford some of the brightest minds from the UK, North America and Europe, involved in building partnerships between universities, industry and government, came together to learn from the ground-breaking effort that characterised the COVID-19 pandemic response to drive the recovery.

The Summit highlighted what needs to be done to mobilise university-industry-government partnerships to develop solutions at the pace and scale necessary to tackle the big issues facing society today such as healthcare provision and the climate crisis.

Innovation is a key driver to overcoming these challenges and provides an avenue to economic growth and recovery. To promote the speed and applicability of innovation, and provide a system in which it can prosper, collaboration between the key actors is critical.

The urgency of the COVID-19 pandemic caused universities, their industrial partners and government funding agencies to respond rapidly and find ways of coming together to find solutions to the health crisis at speed and scale. Key elements of their response included:

- Rapid deployment of funding
- Pivoting to reprioritise resources and capabilities
- Acting quickly to reduce bureaucratic hurdles and speed up contractual negotiations
- Focusing on a single common goal and the implementation of appropriate new ways of working
- Emphasising collaboration over competition
- Reduced opposition to taking calculated risks leading to faster decision making

Leveraging the wealth of experiences of the international delegation, the Summit identified which changes could be maintained post-pandemic to improve the ability of universities, companies, governments and societies to come together to catalyse and drive innovation. These are highlighted in the box below.

Learning lessons from the pandemic to inform future approaches

Build on the strategically important, high impact missions with clear stretch goals to galvanise communities and better coordinate efforts to tackling it.

Develop funding at sufficient scale able to unlock significant breakthroughs towards delivering on key challenge goals. The pandemic has shown what is possible when funding is largely unrestricted.

Celebrate and reinforce the value of the 'triple helix' for developing the solutions to real world problems. It was this partnership that led to the development of the major COVID-19 vaccines around the world. Its true value is often significantly underappreciated.

Continue to elevate the importance of science and engineering capabilities within senior decision-making positions in government and industry. This is important for enabling key decision-makers to understand the potential of scientific breakthroughs and how to invest to translate them to drive real world impacts.

Capitalise on the growth in public engagement with science to develop more user-engaged modes of research and innovation and raise public appreciation of the value of publicly funded research.

Improve coordination within government to funding research and innovation.

Maintain the flexibility of funding to facilitate a rapid response of the research system to tackle COVID-19 challenges. Take steps to place the research system on a long-term financially sustainable footing.

Develop new approaches to partnerships including: reproducing the intensity and focus of the COVID-19 response while ensuring staff well-being and work-life balance; enabling greater mobility between academia, industry and government; and deepening engagement with non-traditional funders interested in developing solutions to specific challenges.

Better configure universities to pursue mission-oriented research, and accelerate the translation and commercialisation of ideas into applications.

Find ways of translating and applying the creativity and collaborative spirit developed to tackle COVID-19 to other societal challenge.

Invest in efforts to learn the lessons from remote working during the pandemic to inform the future of work to make improve both productive and well-being.

Governments and the building of international partnerships to drive innovation

The Summit identified substantial opportunities for unlocking economic and societal wealth from getting countries to work more effectively together. It discussed a number of key drivers and enablers for the role of governments in supporting the formation and nurturing of international partnerships to catalyse and drive innovation.

Drivers and enablers for developing effective international partnerships

International R&I partnerships require much more than funding programmes. Crucially, they require people with the ability to nurture relationships across borders, cultures and organisations; a willingness to engage; and a set of technologies and infrastructure to make them work.

In seeking to develop international partnerships we need to move beyond thinking about research collaborations, and instead think about partnerships that can accelerate the translation and commercialisation of research into impactful applications. This will determine not just where the potential for value is created, but where it is realised.

Countries are at different starting points in terms of their experiences in developing and nurturing effective international collaborations. We need to learn from each other about what works, and under what circumstances, and be willing to experiment with new approaches for specific national contexts.

Global challenges such as climate change, extreme poverty, and global health would benefit from funds of substantial scale at the global level aimed at delivering breakthroughs at pace and scale. These make it easier to identify and assemble capabilities, wherever they exist in the world, to drive progress. It could also help to overcome the skewing effects of national political objectives that can make it harder to develop new collaborations.

Our start-ups and university spinouts must be driven by global ambitions. We need to ensure that the system does not lead these companies to settle for a 'good enough' national market but drives them to develop globally competitive value propositions aimed at changing the world. This needs to be backed by the range of resources (financial, human, physical, technological) to allow them to develop and scale ideas into products and services.

However, building international collaborations presents many challenges which can lead to researchers prioritising nationally-focused efforts.

Challenges to developing effective international partnerships

Concerns that government funding of international collaborations is becoming increasingly influenced by political rather than scientific and innovation objectives. Coupled with rising political uncertainty this creates significant risks for academics in building international alliances.

National security concerns arise more frequently when developing international R&I partnerships. With new legislative requirements, effective and timely due diligence is critically important. However, it is often under-resourced and can lead to delays and frustrations amongst academics.

Countries can have very different national priorities and objectives for building international collaborations. This can lead to unbalanced partnerships.

There can be an imbalance of benefits between partners. More equal partnerships, rather than leader-subordinate collaborations, should be developed when working together to tackle global societal crises.

Bilateral agreements between governments can make it harder to initiate collaborations with researchers in other countries. This can make it harder to deliver on other important research and innovation objectives.

Limitations of current funding structures can make it hard to build and nurture international collaborations due to restrictions on who can be funded. The added complexities and effort can lead researchers to pursue domestic over international collaborations.

Despite progress over the past decade, tensions remain around incentives for individual researchers, incentives for universities as organisations, and incentives to deliver on the nation's strategic priorities for science, technology and innovation.

Many other challenges make it harder to develop effective international partnerships. These include: bureaucracy and high 'transaction' costs; the ability to adapt and reconfigure international partnerships as needs change; communication between partners, including uneven access to communications technologies; a lack of funding to translate and commercialise research outputs; and the ability to demonstrate the value of these partnerships within timeframes set by funders.

Mobilising partnerships to accelerate the transition to a sustainable future

The Summit determined a number of changes that are needed at the system-level to accelerate the transition to net zero and enable university-industry partnerships to contribute more actively and effectively.

Transitioning to net zero: the need for system-wide change

The climate crisis is not a sufficiently major public concern in many countries, with large variations in acceptance between and within countries. In urgently raising awareness, we need a much stronger, more serious communications strategy. This should not be left to politicians alone but draw on leaders and influencers from different parts of societies.

Tackling the climate crisis will require major changes in the behaviour of individuals, organisations and societies, and we need much stronger incentives to drive this. This will be critical not least for accelerating the deployment and widespread adoption of breakthrough innovations. Understanding public acceptance needs to be part of innovation process.

The transition to net zero will likely lead to disruptions to the existing functioning of societies, with effects falling on the poorest communities. We need to take steps to mitigate these effects.

Transforming traditional sectors of the economy such as construction and manufacturing will be key to delivering net zero. Yet these 'legacy' sectors face significant obstacles to innovation and are typically resistant to change. We need to understand the scale and nature of the obstacles to inform targeted action.

Accelerating innovation to tackle the climate crisis will require a greater tolerance of failure across all parts of the innovation system. Many potential solutions will fail, but this process of experimentation is a key part of the journey and needs to be encouraged and nurtured.

Tackling the climate crisis will require big and bold visions to be developed. These need to be ambitious, long-term and escape political cycles that drive short-term mindsets, create long-term uncertainty, and divert effort and investment. Visions need to be at the global level, backed by significant funding and a clear and concise communications strategy.

Big, bold visions need to be translated into ambitious and clear targets and stretch goals that can provide clarity to organisations over the direction of travel, reduce duplication of effort, facilitate collaborations and coordination of effort, and reduce uncertainties in investing in R&D, people, and infrastructure.

Tackling the climate crisis requires a whole-system, whole-lifecycle approach accounting for the multi-level nature of the problem: from the global-to-national-to-local level, across product and technology lifecycles, and across supply chains for each sector. Inclusive approaches will be critical.

Advances in R&D are important, but solutions will also require new skills, infrastructure to drive diffusion, standards and regulations, production processes, supply chains, business models, and incentives and support to nurture nascent markets.

Active planning is required now for the diverse skills needed to tackle the climate crisis. In addition to specific technical skills to develop and adopt new products and services, we also need to train people to challenge the status quo and encourage entrepreneurial disruptors who can think outside the box and take risks when innovating. Tools should also be given to help people to develop their resilience and adaptability.

The urgency of the climate crisis requires development of solutions based on research advances that have already been made. We must improve our ability to translate this research and deploy emerging products and services at both pace and scale. This phase of the innovation process is currently hampered by lack of funding.

More flexible, longer-term funding commitments may be needed. Three-year programmes for building centres of excellence or larger scale collaborations can result in promising research and innovation activity being shut down before success can be demonstrated to raise follow-on funding.

Governments need to leverage their procurement power to help reduce the market risks associated with emerging technologies by creating more certain demand for products and services.

We need to build much stronger and more effective international collaborations to tackle the climate crisis. These are necessary to mobilise the critical mass of resources and capabilities from across the world to accelerate the development of solutions at pace and scale. These collaborations need to happen at all levels, from vision setting to problem definition to developing solutions.

University-industry-government-society partnerships have the potential to play a significant role in helping to accelerate the transition. To enable them to deliver impact at pace and scale, it will require: new ways of working together; building new types of environments and capabilities that can accelerate the translation and demonstration of emerging technologies; and leveraging the scale and position of universities in our societies to lead the change necessary and demonstrate what is possible. It will also require renewed efforts to tackle long-standing barriers, common in many countries, which have made it harder to form, nurture and deliver effective collaborations.

Oxford University Images/John Cairns

Greening partnerships to tackle the climate crisis

Reconfiguring partnerships to accelerate the translation, development and commercialisation of technologies

Summit delegates highlighted the urgent need for new organisational environments within universities – or strongly linked to them – that can assemble the necessary resources and capabilities (including people, equipment, processes) under the necessary conditions (e.g. standards, contracts, IP arrangements) to accelerate the prototyping and demonstrating of emerging technologies. We need to develop more agile and multi-functional teams able to integrate the range of knowledge and capabilities required along the lab-to-market journey. Further, the social sciences have never been more important. We need to break down barriers and siloes to better integrate social scientists into research and innovation partnerships.

Leveraging the position and scale of universities in societies to lead change and provide test-beds for emerging technologies

Universities are typically some of the largest employers in their economies. They also work with many companies of all sizes and across many sectors of the economy. Further, many have strong local, national and global brands which can act to amplify key messages on societal issues of importance. Given this, they have significant potential to take a leadership role in the drive to net zero, not least through demonstrating to others how large and complex organisations with large real estates can transition to become carbon neutral.

Addressing long-standing issues that make it harder for universities and companies to partner to innovate

Building partnerships to accelerate the pace and scale of innovation to tackle climate change will require dealing with long-standing issues and barriers affecting the development of university-industry collaborations more widely. This includes among other things:

- Developing better incentives to encourage academics to engage further in partnering (including looking at recruitment and promotions criteria)
- Strengthening mobility of staff across the academia-industry boundary
- Revisiting approaches to IP to consider whether the current IP regime is fit-for-purpose for incentivising innovation aimed at tackling major societal challenges
- Improving understanding of each other's needs, capabilities, constraints and cultures to improve the ability to work across boundaries
- These issues have been highlighted for many years. We must increase our effort to improve on the status quo

Read the full report at: www.ox.ac.uk/oxfordsummit

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