

Science Minister announces UKRI's open access policy

Thank you for inviting me to speak to you today.

Imperial College has an impressive history as a research-intensive institution and an exciting future. I'm thrilled about the opportunity to visit your White City campus and to see what you've been building there – I've been told I'll see 'levelling up' in action! And of course the work you've been doing to make your research available open access has been an inspiration to the whole sector – not just in the UK but abroad.

This government places science, research and innovation at the heart of our plans to build back better from coronavirus. We fully recognise that it has been only through the ingenuity, creativity and courage of our scientists and inventors that we have found a way out of the pandemic. We will learn from this as we forge a better life for ourselves in the years ahead.

So, it is crystal clear to me, to this government, that we can only realise our ambitions by helping brilliant people to flourish and reach their full potential.

And a big part of this means changing the culture of research and innovation.

It was therefore a huge pleasure to publish the UK's first ever R&D People & Culture strategy last month.

I am genuinely thrilled that the UK government is, for the first time, taking clear and ambitious steps towards tackling some of the longstanding issues that we know we face in research and development (R&D), for example by valuing technical skills, by addressing bullying and harassment, by fixing our PhD training offer, and by embracing diversity in all forms. By working together to follow the path set out in the strategy, we will achieve something amazing.

We'll grow a stronger, more vibrant and more engaged workforce.

We'll become the very best place in the world to be a researcher or innovator.

And we'll lead the future by creating it.

But today I want home in on one specific aspect of research culture, and that is open research.

It has been true for a long time that our research sector has a particular and unequivocal drive towards openness. We have a duty to make the findings of publicly funded research openly available, to make them as useful and impactful as possible to all potential users, for the benefit of everyone.

It was Professor Dame Janet Finch who famously wrote the following words about open access:

The principle that the results of research that has been publicly funded should be freely accessible in the public domain is a compelling one, and fundamentally unanswerable.

This was in 2012.

Nine years later, this principle remains unanswerable – even as global threats evolve.

Just take the COVID-19 pandemic.

In just one month, researchers sequenced the viral genome and shared it freely online as an open-access publication in the Lancet. Researchers from around the world went on to build incredible new data-sharing tools, opening up rich new data sources on epidemiology or policy, and posting countless new findings onto preprint servers.

Many journals took the necessary step to make all their papers relating to COVID-19 freely available.

By sharing research as openly and quickly as possible, and learning quickly from negative results and any unsupportable conclusions, we delivered the vaccines and treatments that are our surest way to stopping this deadly pandemic in its tracks.

This should be an example to all of us of what's possible when research culture changes, and when behaviour changes. And what can be done when open research practices are widely adopted, with no excuses. But this isn't a new imperative. Open research is an agenda where the UK has long been in the global lead. When it comes to the UK's position on this agenda – I'm a believer!

And we should recognise that we have made good progress. Significant amounts of publicly funded research have been made free to read and reuse.

Studies show that at least 28% of articles are now free to read – increasing to perhaps half of all articles by some measures. And a recent study of 1,207 universities found that some made as much as 80 to 90% of their research free to read in 2017 – with 40 of the best-performing 50 in Europe being UK universities.

Other nations have been inspired by our courage and our conviction. From the Australian Research Council to Horizon Europe, many other governments, agencies and programmes have introduced open access policies of their own.

And I am thrilled that we were able to get a strong G7 commitment to open science this summer as part of the UK G7 Presidency, with agreement to incentivise open science practices; and promote the efficient and secure

processing and sharing of research data across borders that is as open as possible, and as secure as necessary. Publishers, on the whole, have been responding to the incentives – and should be praised for showing leadership and not shying from the challenge we have set. Read-and-publish deals have been struck with Springer Nature, Wiley and the Microbiology Society. The pioneering open access publisher PLOS is piloting a new pricing scheme to eliminate author charges. And the ground-breaking Open Library of Humanities is now supported by over 300 institutions, making research across its 28 titles openly fully available to a wider audience.

Of course, there will be hurdles to overcome as everyone adapts. But the prize of open research is more valuable than any one stakeholder or business model.

The truth is that we must all go further.

There are still far too many articles that end up locked away behind paywalls – being cut off from an unimaginable range of useful applications in industry, in healthcare, or in wider society.

And when articles do become openly available, this is too often after a year or two has passed, when the embargo has finally been lifted and when in all likelihood the boat has sailed, the opportunity has passed, and the research field has moved on.

And there is a further wealth of research in the humanities and social sciences which winds up published in scholarly monographs, often with eye-watering price tags, and available only on the bookshelves of a small number of university libraries – not reaching the audiences it should.

When the most up-to-date record of human progress is locked away behind a paywall – and where those in need of publicly funded knowledge are told to cough up or lose out – you know that the situation has to change.

What I'm talking about here is work which is paid for by us all, in taxes. Work that we make a choice to invest in for our collective benefit.

And it's work which is quality-assured by researchers themselves, through the network of volunteer peer reviewers.

Arguably, it is the ultimate public good.

In the digital age, where a "paper" is but a microscopically small yet infinitely reproducible string of ones and zeros, we should all see the tantalising opportunity in front of us, to share freely the fruits of knowledge far and wide.

So that is why I am delighted to announce that UKRI is launching its new open access policy. This is a policy that will achieve the government's ambition, set out in the R&D Roadmap, of full and immediate open access for research articles – so from the day of publication, the results of UKRI-funded research are available for all. This policy will ensure that the results of UKRI-funded research are made as freely available as possible – not just for

reading, but for reusing and recombining with other results, and creating the shared repository of human knowledge that will unlock the potential of even more people, in the UK and abroad, to learn, to discover, and find innovative new solutions to our most pressing problems.

And while it seems obvious that this is a necessary move by UKRI, it is not a decision that they have taken lightly. They have consulted and engaged on this policy for well over a year, talking to countless stakeholders and receiving over 350 inputs to their consultation. UKRI have gathered new evidence and engaged closely with other funders such as Wellcome to learn from their experiences and find common approaches.

And I am particularly pleased that the UK has, from the start, been a central player in the major international collaboration, Plan S – a plan to deliver full and immediate open access to the world's research output. As a global science superpower, it is right for the UK to be at the heart of the global push for open research.

I also know that full and careful consideration has been given to the details in the UK context. I have listened to the arguments and met with many stakeholders myself.

My conclusion is that UKRI are to be applauded for taking this decisive step.

Of course, opening up the findings of research won't change culture on its own. The open research agenda is about more than what's written on the pages of journals and books.

The open research agenda is also about improving the very fabric of research, changing the way it's undertaken as well as the way it's communicated. This means opening up new possibilities for more creative and imaginative ways of undertaking and sharing research. And increasing transparency and sharing across the research process. As much as possible, we need to apply the principles of transparency and free access to more than just scientific publications. Open research encompasses all aspects of the research process, and research artefacts such as data, code and materials.

That is why it's so important that we see the continuing emergence of new initiatives like Octopus: an experimental new platform for scientific research to be made available as separate elements – the problem statement, the methods, the data, and so on – all linked together, and all openly available.

Octopus has the potential to significantly disrupt the way that research is communicated, improving research culture. I'm delighted to announce that Octopus will receive £650,000 in funding from Research England's Emerging Priorities Fund over the next three years, to help develop this prototype into a reality.

And while technology is important, it is critical that we get the incentives right, as we are indeed doing. Open research is already a key feature of the current Research Excellence Framework, as it will be in the next.

And the Global Research Council of the world's research funders recently agreed that open research should be considered a dimension of research excellence and should be incentivised in assessment criteria.

This is something that funders take very seriously, and it is an area which will be key to delivering the vision set out in the People and Culture Strategy that I launched last week.

Let me conclude. The UK has a proud history at the forefront of research communication.

The Royal Society can proudly lay claim to inventing both the academic journal and the system of peer review that underpins it, way back in 1665.

It's not hard to imagine our forefathers, themselves striving to build back better from the devastating impact of the bubonic plague, becoming energised by the new scientific discoveries published by the Royal Society – and bringing the Age of Enlightenment blinking into life all over Europe.

And fast forward to 1989, as particle physicists at CERN smashed electrons and positrons together in a huge underground ring, British scientist Tim Berners-Lee invented the World Wide Web – a new tool for connecting scientific knowledge in online web pages, and an invention which has defined the modern age.

And it was Stevan Harnad, a cognitive scientist from Southampton University, who prominently questioned the very purpose of the printing press in this new scientific digital age, sparking development of the EPrints research repository platform and the world's first utterance of the term "open access".

It was then my predecessor David Willetts who recognised the public interest in open research, and kindled those sparks of the early adopters into a flame, with Janet Finch's report giving research funders the mandate to take those early steps towards a policy.

So, as we strive to build back better from the pandemic of today, now we can take our own step forward.

By unequivocally opening up the UK's publicly funded research for free and open use and reuse, we will usher in a new scientific digital age – one where the unnecessary constraints on knowledge are cast off.

Today's announcements are our own watershed moment in our history as a scientific nation.

Together we will develop a new culture of openness and collaboration, as an essential part of building the research culture we need to embrace the challenges and opportunities ahead.

Thank you.