Higher Education Commission call for evidence:

University Research & Regional Levelling-up Inquiry
Submission Deadline: Friday 2nd July.

Respondent information:
1. What is your name and role?
Amanda Chetwynd-Cowieson, Senior Public and External Affairs Officer

2. Which institution or organisation are you submitting evidence on behalf of?
Jisc.

3. Do you give permission for the Commission to quote your submission?
Yes.

4. Can we attribute the submission to the institution/organisation?
Yes.

5. Can we attribute the submission to you personally?
N/A

6. If applicable, please briefly outline your organisation's current UK-based research and development work. Please include details of collaborative engagements with external partners – such as HEIs, Catapults, OEMs, SMEs etc.

Jisc is the UK’s digital body for research, higher and further education and skills. A major supplier of data, digital and technology infrastructure for research, Jisc provides the Janet network which gives super-fast and uncontested bandwidth, access governance and cyber security services across UK further and higher education and research institutions, research consortia, and a range of public sector organisations. Jisc’s vision is for the UK to be the most digitally advanced education and research nation in the world. Jisc believes that education and research improve lives and that technology can improve research.

Now, more than ever, the power of research and innovation are evident: UK research programmes and international collaborations are at the forefront of tackling global challenges, from Covid-19 vaccines to the climate crisis. Jisc operates, protects, and develops the Janet network – the ultra-fast UK National Research and Education Network (NREN), enabling access to the digital infrastructure that UK education and research relies on, with built-in cyber security protection. Jisc provides technology solutions for colleges, universities, and research institutions as well as public sector bodies, helping save time and money by negotiating sector-wide deals and providing advice and practical assistance on digital technology. Jisc also connects UK research internationally through our membership of the global national research and education network, GEANT, comprised of organisations akin to Jisc across the world.

The Janet network enables that rapid and secure scaling for multi-sector collaborators. For example, a single network-integration point for Rolls Royce enables fast and secure data exchange with its Janet-enabled research collaborators across the UK, reducing costs and environmental load by avoiding duplication. Jisc hope to extend how infrastructure can follow the support researchers regardless of place, collaboratively investigating additional use cases for these trusted research environments with fellow representative bodies focused on knowledge exchange, for example, PraxisAuril and the National Centre.
for Universities and Business (NCUB) - to further utilise the national infrastructure in supporting the levelling-up agenda.

Our infrastructure and services operate both across the UK and the rest of the world, supporting research with equitable, safe and capable digital provision, wherever it is undertaken. Jisc is funded by the UK higher and further education and research funding bodies as well as its member institutions.

**Jisc’s New Research and Innovation Sector Strategy**

Jisc recently launched a new research and innovation sector strategy, which recognised the important role that infrastructure, research analytics, data and knowledge exchange will play in enabling economic growth, reducing regional disparities and supporting the longevity of the UK’s research base. Following widespread sector engagement, including convening a group of 18 Deputy and Pro-Vice Chancellors for research and innovation from a diverse range of UK institutions to form our research strategy forum, the strategy identified priorities including sustainability and resilience, equality, diversity, and inclusion, reducing bureaucracy, excellence and ethics, and place. Simultaneously, Jisc brought together a digital research community to continue and extend engagement with the broader research community, ensuring the research and innovation sector strategy remains sector informed. With the community now comprising of 300+ members from a variety of roles throughout the research community, Jisc will continue this engagement to ensure an evolving, comprehensive and representative approach.

The strategy also identifies the opportunity for high-quality, well-supported research and innovation infrastructure to be deployed to the benefit of all communities UK-wide. Of the seven strategic themes, four are particularly relevant in highlighting how digital platforms can continue to enable greater R&D collaboration and activity across all areas and regions of the UK, alleviating the fact that, as demonstrated in Nesta’s recent report ‘The Missing 4 Billion’, London, and the sub-regions containing Oxford and Cambridge, account for 46 per cent of total public and charitable spending on R&D:

1. Research data infrastructure
2. The research estate
3. Research analytics
4. Applied research and knowledge exchange.

**General Questions – All Respondents**

**Q. How should skills provision and training change to enable greater R&D output?**

Jisc recently supported think tank Demos to carry out ‘Research 4.0: Research in the Age of Automation’ investigating the impact of Artificial Intelligence on the research sector to support the digital transformation of research practices. The report identified the place-based challenges and opportunities of enhancing capacity. A key recommendation from the report was ‘that the current post-16 curriculum should be reviewed to ensure all pupils receive a grounding in basic digital, quantitative, and ethical skills necessary to ensure the effective and appropriate utilisation of AI’.

When it comes to working with AI tools to the benefit of research and innovation, data science skills are at the core, ensuring good data governance, quality, and utility. A grounding in these skills from the post-16 level will benefit everyone, across all regions and nations of the UK, and Jisc is well-placed to support this development, through sector-wide working on digital skills frameworks and curricula, such as the recent digital standards developed as part of the Welsh Digital 2030 framework.

Working with others in the sector, Jisc could be central to identifying the data, digital and technology skills, and knowledge across all levels of education, including helping institutions to improve their support for early- and mid-career researchers.
Jisc’s well-established digital experience insights and digital capability services are already well-utilised by its members in taking steps towards meeting those needs. At the international level, our work on skills and training in the European Open Science Cloud ensures Jisc are at the forefront of identifying and supporting these fundamental data, digital and technology skills.

**Q. What would enable more collaboration between universities and industry on innovation?**

Jisc believe the following areas of focus would enable more collaboration between Higher Education Institutions, research institutes and businesses to the benefit of local, regional and the national economy:

I. Reduction in disparity of access to research computing and data infrastructure, starting with a UK wide audit of current capacity.

II. Extending the infrastructure supporting applied research and Knowledge Exchange.

III. Better use of open data about research and its management to underpin decision-making and understanding of the benefit of investment over the long-term.

**A UK Wide Audit of Research Computing and Data Infrastructure**

Demos Research 4.0: Research in the Age of Automation report, supported by Jisc, recommended that a UK-wide audit of research computing and data infrastructure provision is conducted to consider how access might be levelled up nationally. This would enable Government and the sector to address any current disparity in access to critical digital research infrastructure services, that are vital in ensuring cutting edge research can be carried out across institutions and regions, securely and at pace.

Solutions for reducing the disparity of access to digital infrastructure and continuing to support development of Authentication, Authorisation and Accounting Infrastructure (AAAI) that could eventually enable a single set of credentials to log in to any digital research infrastructure resource, are of significant interest to Jisc. The growing role of AAAI as a vital component of the UK’s future E-infrastructure is a result of fast-paced developments over the last few years in the research process where Artificial Intelligence (AI) could play a stronger role in enabling these processes.

**Extending the infrastructure supporting applied research and knowledge exchange.**

As the UK commits further to removing barriers to innovation, the breadth of academic-industry collaborations and commercial spinouts from research is set to grow. Collaborations and commercialisation moving “off-campus” is creating a vibrant ecosystem of institutions that require the same access to research facilities. The Janet network enables rapid and secure scaling for multi-sector collaborators. Jisc hope to extend how infrastructure can follow the researcher, broadly defined, collaboratively investigating additional use cases for these trusted research environments with fellow representative bodies focused on knowledge exchange, for example, PraxisAuril and the National Centre for Universities and Business (NCUB) - to further utilise the national infrastructure in supporting the levelling-up agenda.

Jisc is building capability through the deployment of flexible, trusted components. For example, our public cloud services, including the Jisc-managed OCRE framework, (which is an EU-compliant procurement framework for cloud infrastructure as a service), managed access governance, negotiated licences for software, data analysis tools and those for the movement, management, storage, and preservation of data. The aim is to support research and innovation collaborations to implement data-focused infrastructure more rapidly. Jisc see increasing demand to extend this infrastructure more connectedly into the civic and commercial collaborative research space, with well-governed, trusted research environments, managing IP, commercial interests, and sensitive data.
Jisc envisages more multi-sector approaches, through these well-established equitable service models, lowering barriers, supporting civic institution research infrastructure. The opportunity is there not only to promote faster routes to implementation, reducing the lag between research project approval and implementation, but also reducing technical and carbon debt and saving costs in moving research consortia through technology as it develops.

**Q. What would be the best way to facilitate more extensive pan-regional collaboration on innovation?**

Jisc sees the clear opportunity for the high-quality, well-supported research and innovation infrastructure to be deployed to the benefit of all communities, encouraging more in-depth and extensive pan-regional innovation. In terms of how digital platforms enable greater R&D collaboration and activity, our infrastructure and services operate globally to regionally, offering equitable provision irrespective of size or location.

Jisc runs eduroam, the secure, world-wide roaming access service enabling connectivity across campuses, and similarly launched govroam to provide these benefits across the public sector, now in over 5000 public sector venues across health, blue light and local government. Jisc is offering local authorities in England the opportunity to implement eduroam via their existing govroam network, at no extra charge, to extend connectivity in public spaces such as community centres. The aim is to help those learners and researchers who do not have access to good quality or cost-effective broadband at home, to access eduroam across the English regions. Enabling researchers to access critical digital infrastructure across the regions and extending this capability across the Science Park network, supports the UK government’s R&D Place Strategy, which will seek to build on local potential so that all regions and nations of the UK benefit from a R&D-intensive economy.

**Research Estate**

The physical and intangible assets which comprise the research estate such as equipment, facilities, code and software, IP and instruments, algorithms and even methods, are central to the civic agenda, as well as international collaboration, equality, diversity, and inclusion and achieving net-zero. One of the key things which came through from our consultation, especially in light of the pandemic, was “how do we know what we’ve got to then deploy that research capability?”

Through our management of the platform which aggregates data about EPSRC-funded equipment, Jisc see the potential to build on that capability to map critical mass and utilise those capabilities more effectively. Jisc have identified a gap other sectors do not sustain – to understand those assets and expose them to collaborative multi-sector approaches - optimising their potential in terms of decisions about the deployment of funding, increasing commercial participation and investment.

Jisc run data services, for example through HESA, the higher education statistics agency and our participation in the UK Data service, and also learning analytics services. Jisc note the potential for better understanding of capacity in supporting investment decisions based on enhancing regional capability. Jisc has developed the Knowledge Exchange Framework dashboards for UKRI/Research England. Jisc identify the opportunity to extend the potential of high-quality open data collected in the course of research assessment processes, to link it even more widely, where benefit is identified.

Such an approach offers the potential to provide rich detail as to the research and innovation capacity and capability of regions. A focus on long-range approaches, improving the utility of data, would offer the ability to evidence the potential for economic impact and investment, and understand that capability with additional nuance.
Jisc see an opportunity to extend that civic institution focus and consider a range of open data to understand the links between the investment of research funding and the resilience of local communities, economies, and infrastructure.

Many areas anticipate an increase in inequalities as a result of the pandemic; addressing relative exclusion from access to the research and innovation ecosystem and potentially offering the potential for much more locally defined impact, forms a key opportunity in informing levelling-up policies.

**Open Access / Research**

These assets also include negotiation and licensing for access to content and collections, and open access to research outputs. Jisc estimate that up to 60% of UK research output is covered by a Jisc agreement for immediate open access. Over 90% of UK universities participate in these agreements. Our aim is to make all UK research immediate open access, so it can support innovation as near to publication as possible.

The opportunity is there to focus UK open access research output into that local context, linking across our further and higher education and civic institutions as part of that estate. Often it is simply a matter of signposting, for more consumption of research outputs and resources by more people.

**Q. What should be the primary focus of the UK Government’s Advanced Research and Invention Agency (ARIA) in order to maximize economic impact?**

Jisc understands the need to continue to look ahead in terms of investment decisions related to advanced technologies and see the opportunity to deploy the critical research network capacity, connectivity and investment in cyber security of national interest in supporting and advanced research and invention. There is the impact of growth in the need for high performance computing, dark fibre and virtual private networks, the impact of 5G+, advanced materials and looking much further ahead, for example, the impact of quantum advances on research. How might ARIA’s approach the deployment of new centres of excellence focused on advanced technologies support the levelling-up agenda?