

BEIS R&D Roadmap Survey

August 2020

About GuildHE

GuildHE is an officially recognised representative body for UK Higher Education. Our members are universities, university colleges and other institutions, each with a distinctive mission and priorities. They work closely with industries and professions and include major providers in technical and professional subject areas such as art, design and media, music and the performing arts; agriculture, food and the natural environment; the built environment; education; law; health and sports. Many are global organisations engaged in significant partnerships and producing locally relevant and world-leading research.

500 words per section

1. How can we best increase knowledge and understanding through research, including by achieving bigger breakthroughs?

By not concentrating research in one or two parts of the UK

1. The research and development ecosystem is complex yet funding is concentrated in only a few institutions primarily in the “golden triangle” of London, Oxford and Cambridge.
2. This historic approach has held back innovation and research capability and capacity in other parts of the country. The R&D Roadmap offers the chance to redress this balance by providing other institutions and regions the chance to grow and develop which can lead to bigger breakthroughs.

By actively supporting all disciplines and interdisciplinary research

3. In their expert reviews of research and innovation in the UK and of the Research Excellence Framework, both Sir Paul Nurse and Lord Stern identified the need to better support interdisciplinary research, recognise the value of different types of research (i.e. pure, applied, translational and so on), and to break down some of the unhelpful silos that stymie innovation and dissuade novel research questions.
4. Attention needs to be paid to all disciplines because big breakthroughs come from all disciplines. We welcome the emphasis at the start of the roadmap that “science” and “research” means all academic disciplines, including the natural sciences, technologies, medicine, the social sciences, the arts and the humanities. Actions that result from the roadmap should re-emphasise this point.
5. Many smaller and specialist universities undertake practical research closely aligned to crucial segments of the economy such as agriculture, sectors allied to health, such as sports and exercise science, and the creative and cultural sector. There are real opportunities to leverage the expertise and industry connections of specialist HEPs, for example, if such biases and ‘hard lines’ in the system were eliminated through funding structures.

By active engagement with diverse and different stakeholders, users and researchers

6. We echo the NCCPE’s response that emphasises the importance of engagement and states: “R&D offers enormous potential to transform our society and economy – but involves very significant political choices about where and how to invest to realise this potential. When these

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choices are out of step with society (e.g. GM crops) or misunderstood (e.g. vaccinations) the backlash, erosion of trust, and impact on behaviour can be profound, and have long lasting social and economic fallout.”

7. We need to involve a wide range of people in R&D to achieve genuine big breakthroughs that can be embedded into our culture and society. In particular, we reference the work of Common Cause Research (<https://www.commoncauseresearch.com/>), an AHRC funded project which has specifically investigated the experience of black and minority ethnic communities in research collaborations. This work has resulted in a useful set of ‘fair trade principles’¹ for research collaborations which provides solid recommendations for conducting research that is inclusive.
8. We also reference the recent report from the Institute for Community Studies (<https://icstudies.org.uk/our-approach/safety-numbers>), Safety in Numbers?, that sets out the questions that matter to communities, as told to ICS and prioritised by people across the UK.

(495 words)

2. How can we maximise the economic, environmental and societal impact of research through effective application of new knowledge?

By acknowledging that one size does not fit all

9. We strongly welcome the continued funding commitments from government for R&D. Additional funding should focus on addressing major challenges, including the Sustainable Development Goals as well as those raised in profile by the pandemic. Allocation and evaluation mechanisms will need to fit this approach accordingly. The ambitions of the government’s investment target should be reflected in the funding goals, building in elements of interdisciplinarity, international collaboration and the stability of long-term and innovative funding.
10. As part of this approach, it is important that a “One size fits all” approach is avoided - different sectors require different approaches.

By utilising the potential of specialist universities

11. Within this context, it is important to recognise the current and future economic, social and cultural contributions of smaller and specialist universities. They are closely aligned to the professions that they serve through carrying out practical research and well-positioned to stimulate the growth of key priority economies, such as the creative industries, health and agriculture.
12. There is a real risk that a contracting economy will lead to market failures of creative clusters in poorer parts of the UK. This would entrench existing inequalities between regions. Investing in research and development that supports the £100b creative economy is therefore crucial for the rebalancing of the economy and for mitigating the social and economic impact of Covid-19 outside London. Creative specialists are well-positioned both geographically and industrially to support this rebalance.
13. Agricultural specialists deliver the absolutely essential role of the agri-tech and food sector in sustainable recovery, environmental targets, food security and do so through innovative knowledge exchange and delivering high level skills in improving productivity and efficiency of the sector.

¹ ‘Fair and mutual research partnerships: 10 principles for university-community partnerships’. Accessed 11 August 2020 at: <https://www.commoncauseresearch.com/report/>

14. Smaller universities undertake research in areas related to health, such as sports and exercise science (SES). Obesity, diabetes, cancer, and depression are all areas in which SES research is playing a pivotal role in improving the health of everyone. Research in these areas is preventing and treating conditions and diseases that cost the NHS billions every year and are becoming ever more important as we face the challenges of an ageing population.

By enabling local leadership

15. The Roadmap highlights the importance of local leadership and that it is important for heads of research institutions to actively engage with them. We believe that government should help broker local relationships where civic leadership does not always see the value in R&D.
16. Mechanisms, such as regional funding competitions, to encourage both would be beneficial because this would enable strong, locally owned partnerships to develop that would address the local economic, environmental, social and cultural challenges and opportunities in an area, which in turn may result in greater national benefits.

By engaging with the Climate Commission for Further and Higher Education

17. We recommend that government engages with the Commission to ensure there is a clear and feasible pathway to reach its targets for research and innovation.

Words: 485

3. How can we encourage innovation and ensure it is used to greatest effect, not just in our cutting-edge industries, but right across the economy and throughout our public services?

By enabling end-to-end support for R&D

18. Support for innovation and research and development is key to the long term recovery and growth of the UK. We support the direction of travel outlined in the R&D Roadmap
19. We support the CBI's advocacy for end-to-end support for research and development that covers applied research and knowledge exchange as well as discovery research.

By having a wider definition of innovation to enable to best ideas to emerge and grow

20. We support the recommendations of the *Nesta report: Innovation after Lockdown* <https://www.nesta.org.uk/report/innovation-after-lockdown/>:
- a. Creating innovation policies that serve the whole economy, not just 'frontier' sectors
 - b. A far greater focus on building innovation capacity across the country
 - c. A more proactive approach to guiding innovation in the public interest
21. Excellence in innovation should involve looking at innovation in teaching where excellent knowledge transfer can take place and lead to growth in particular industries and regions. For example, Abertay University's approach to supporting the cybersecurity industry involves student placements with relevant companies, allowing genuine two-way learning experiences. The Teaching and Knowledge Exchange Fund is a good example of an intervention that could transform the way KE delivers results.

Innovative Funding

22. Innovation can take time to develop before it yields economic benefits for local regions and communities. Quick wins without strong foundations will not be sustainable. Therefore projects

should ideally have a long timeframe with phased development. For example this might be three years research and development, plus two years for product to market.

23. A research and innovation recovery and growth fund for smaller and micro companies, similar to Innovate UK funding, should be considered. Levels of funding should not be large. This might make it more likely for funding to be leveraged from other sources (the need to match fund often being a major barrier). This is particularly the case for KTPs in the creative sector - it is hard for smaller companies to provide funding even when they see the need to invest in R&D.
24. For example, flexible proof of concept small-scale funding such as Business Innovation Vouchers (eg £5k-£10k) have been successful in allowing collaborations with business to start and test potential innovations.
25. In future proof of concept funding could be used even more flexibly. As well as funding R&D directly, the money could be used as 'business' contribution to other funding instruments, because network funding decisions are made by business people (in conjunction with academics). This could include contributing the 'business' element of Innovate UK competitions, or the 'business' contribution to CASE awards in doctoral training partnerships.
26. We also support the Creative Industries Federation's recommendation in *A Plan to Reimagine* on R&D Tax Credits:
 - a. *"We propose a speedy, even if temporary, adoption of the international definition of R+D that would be open to the creative sector. A trial period would help drive innovation at a time when it's needed the most, ensuring our worldleading sector remains at the cutting edge, but also unlocking its potential to help tackle local and global challenges, from the regeneration of our high streets to sustainability and climate change."*

Words: 520

4. How can we attract, retain and develop talented and diverse people to R&D roles? How can we make R&D for everyone?

By recognising the Importance of part-time postgraduate education

27. Specific support for part-time doctoral students should be considered as part of the BEIS R&D Roadmap. Part-time study allows students to bring their learning into their day job and take practical applications back into academia. This means that stronger practice is developed as well as theory, providing immediate benefits to employers as well as longer term benefits. A funding model similar to a KTP could be considered, where funding is available for practical, part-time PhDs. Diverse types of people from all backgrounds could be encouraged to undertake PhDs as part of developing research skills across the economy. The subject scope should be broad - STEM only subjects will not enable the full economic, social and cultural recovery and growth of the UK.
 - a. GuildHE Research members have ability and experience in delivering part-time doctorates. Over 60% of our PGR students are part-time, compared to a sector average of 23%. We would be happy to work with government on initiatives in this area.

By committing to address race and research

28. There has been long standing attention paid to diversity within the research community, for instance through the Anthea Swan and Race Equality Charter processes. However, progress is still slow. The recent Wellcome review of Research Culture revealed that 41% of respondents thought that their institutions' EDI initiatives were 'tokenistic'. What is needed now is serious funding and political support for positive and practical action.

29. At GuildHE, we have started thinking through principles for change to support smaller and specialist universities address the challenges. We believe there are five actions:
- Admit there is a problem/inspire change in your community
 - Identify how the problems manifest within your specific context
 - Create a solid SMART action plan
 - Be transparent and communicate with your constituents
 - Do something... and keep doing it
30. The 2018 Common Cause project examined how to increase the participation of BAME communities in research. As previously mentioned, its 10 principles provide a useful framework for addressing the current crisis. <https://www.commoncauseresearch.com/>

By investing in the knowledge brokers

31. R&D is a very complex process. It involves risk, long term planning, effective collaboration, and sophisticated methods and project management. Together with the NCCPE, PraxisAuril and ARMA we know R&D relies heavily on skilled professionals to maximise its chances of success – but their contribution is often under-valued, and their influence limited to playing ‘support’ roles. Research centres now employ a wide range of skilled professionals in these roles, from experts in technology transfer, impact specialists, patient involvement leads to public engagement professionals. However, many of these staff are on short term contracts, with limited long term prospects or progression into leadership roles. They also often operate in ‘silos’ within their institutions (see ARMA’s latest research). In smaller HEIs without HEIF, these roles are even more precarious. This also requires urgent attention, to better balance sector capability.

Words: 483

5. How should we ensure that R&D plays its fullest role in levelling up all over the UK?

By enabling the higher education sector to support the Covid-19 recovery of all parts of the UK

32. Universities are key anchors and hubs for their local economies providing expertise, graduates etc. They are also engaged with the different sectors of the economy. They are tied into local ecosystems so can channel intelligence about particular sectors back to local and national government.
33. Good ideas already exist. Allow all universities to adapt and replicate them rather than keep concentrated in a few places. This could take the form of regional growth hubs/ investment zones that link academia, business, civil society, LEPs (where applicable) and local authorities together. Such hubs could be organised around particular sectors (eg creative; allied health) to drive innovation and to offer job opportunities to graduates so that they remain in their place of study. The role of Knowledge Quarters and Innovation Districts should also be considered in this light.

By reforming the Higher Education Innovation Fund (HEIF) to support regional socioeconomic recovery and growth

34. The highly effective HEIF should be reformed by adding a regional weighting and removing the lower thresholds in the Fund (we can provide further, specific evidence on HEIF).
35. This would enable smaller, innovative universities in poorer parts of the country to drive growth through practical research, jobs creation and knowledge exchange.

- a. Smaller and specialist universities are agile and can maximise impact from smaller investments due to simpler infrastructure and closer-to-market research. Amending the HEIF distribution would give them the potential to drive long term socioeconomic growth in a way that they have been hindered from doing in a sustainable way previously.
- b. Those smaller HEIs that have HEIF have been able to drive growth for their towns (eg Worcester) or industries (eg agriculture) but have had to sacrifice other promising research initiatives and knowledge brokerage resources in order to continue to secure HEIF due to being so near the meaningless minimal threshold. Removing this minimal threshold would enable smaller and specialist institutions to unleash their untapped potential.

By adapting Strength in Places for less economically advanced parts of the UK

- 36. Strength in Places is an innovative fund that supports cross-sector, cross-border collaboration with a place focus. However, it is set up to support economies that already have some scale and element of excellence in research: the funding and ambition on offer is too high for developing economies in other parts of the UK.
- 37. The city-based focus of place-directed strategies leaves out towns and rural areas, which are a major contributor to the UK economy. There are other important lenses to examine inequalities such as considering coastal, rural and inner-city places as well other places where there may be small pockets of deprivation which are masked by the broader wealth of the area.
- 38. For example, the UK rural economy is thinly spread and hence no single location for investment presents itself in the way that a major urban centre would. It may always fall behind in a place-directed funding approach unless it is given particular consideration.
- 39. Therefore, Strength in Places should be adapted to support lower-level economies to help them develop capacity and capabilities to take projects within particular emerging economic sectors. This could in part replace some of the research and innovation elements of European Regional Development Funding.

words: 543

6. How should we strengthen our research infrastructure and institutions in support of our vision?

By reforming the distribution of quality-related (QR) research funding to support emerging research institutions

- 40. We would strongly support an increase in the proportion of research funding given over to QR allocations.
- 41. Furthermore, the HoC Science and Technology Committee endorsed our recommendation to gear the QR formula for institutions with relatively low QR allocations:
<https://www.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/news-parliament-2017/balance-research-innovation-spending-report-published-17-19/>
- 42. The time lag between assessment exercises combined with the rate of change of smaller universities' research activities results in their QR allocation quickly becoming out of kilter with their actual circumstances.
- 43. This represents a 'capacity-gap' for small institutions in receipt of QR that constrains their pace of development and potential for delivering wider socioeconomic benefits in the interim period between assessment exercises.

44. We see an opportunity to introduce a year on year uplift of QR, via a 'gearing' formula providing at maximum 10% increase in funding, for institutions with relatively low QR allocations. This would be expressly to support emerging research environments to establish infrastructure and capacity to keep pace with mandates and enable them to more effectively enter competitive schemes.
45. We acknowledge that such investment would need to be monitored to ensure the additional funds are used for expressed purposes. We suggest institutions provide strategies for the additional investments, and also provide monitoring data at reasonable intervals.
46. This would, in our view, truly help to support excellent research, wherever it is found at a time when the UK needs a very strong R&D system to support recovery from Covid-19 and longer-term economic, social and cultural growth.

By learning from the Research England Development (RED) Fund and Expanding Excellence in England Fund (E3)

47. Both RED and E3 are positive schemes that aim to support excellence in research and knowledge exchange wherever they are found. They provide a range of funding that could greatly transform the benefits that smaller HEIs deliver.
48. However, the policy delivery has been lacking: E3 aimed to support excellence wherever it exists but where it is at a small scale with potential for growth. Yet no smaller or specialist provider other than the Royal Northern College of Music received funding, despite two research intensives doing so, neither of whom are small.
49. Similarly, RED promises to fund new forms of knowledge exchange, including in HEIs not receiving HEIF. Yet, to date, all eight of the published projects are being run by HEIs that receive HEIF: <https://re.ukri.org/index.cfm?LinkServID=48AC2816-5F46-478C-8FAE7510D67BB13E>
50. This disparity between policy intention and funded project needs to be addressed as public funding is being further confined to select research intensive HEIs. This risks good research and KE going unfunded and reduces the long term capacity and diversity of the UK's R&D system, making it unlikely that even if the 2.4% target, it will be realised in all parts of the UK.

By balancing 'hard' and 'soft' infrastructure

51. We support the NCCPE's argument that physical infrastructure is obviously essential to a well-functioning R&D system but 'soft', people based infrastructure is vital to maximise collaboration and involvement across the system.

Words: 514

7. How should we most effectively and safely collaborate with partners and networks around the globe?

By investing in connections and collaborations

52. Particularly in light of industrial and global challenges, ideas can come from unexpected angles - for example, arts and design thinking could be applied to a health and sanitation challenge (see the Waterspoutt project: <http://www.waterspoutt.eu/>). Connections between disparate disciplines are not easily achieved, either by a single or even the same type of HEP (research-intensive, mid-sized civic university, small generalist or specialist institution).
53. Investing in the capacity of existing networks and enabling them to connect with other existing networks is necessary in order to form effective and productive partnerships. For example, further links and bespoke matchmaking could be developed between different specialist universities.
54. Online collaboration can help in the absence of face-to-face meetings and can be more equitable for some organisations but not all, particularly those operating in parts of the world with poor data connectivity.

55. For example, we are exploring partnerships with the Association for Commonwealth Universities around matchmaking smaller specialist UK universities with universities overseas who have shared research objectives.

By investing in UK capacity

56. UK institutions need incentivising to work collectively together otherwise projects will remain in one part of the system. Horizon 2020 was successful in encouraging larger UK institutions to work with smaller UK universities in order to develop global projects. This learning should be taken into account when developing UK schemes.
57. ERDF programmes were also successful in creating local cross-sector collaborations to entice overseas investment into regions and in growing existing research in poorer parts of the UK. A UK successor, such as the proposed UK Shared Prosperity Fund, is essential in order to build up and develop capacity in all parts of the UK so that international projects can be undertaken.
58. We echo UUK's argument that funding should support bi/multilateral collaboration with developed and developing countries and that there should be a simplified funding landscape for global collaboration covering all stages from networking, pump priming, workshops, to collaborative projects at different scales.

Words: 328

8. How can we harness excitement about this vision, listen to a wider range of voices to ensure R&D is delivering for society, and inspire a whole new generation of scientists, researchers, technicians, engineers, and innovators?

By being brave with funding

59. It is important to maintain a healthy ecology of funding types and sizes. Such an ecology should include both diversity of approaches, and stability to underpin all activity so that novel and emerging areas which cannot be predicted have resources available to them.
60. A good example of funding diversity is Innovate UK's approach, which includes small-scale, high risk, and seed-corn funding opportunities alongside those targeted at projects with a longer track record. This approach enables more innovative ideas to get off the ground and find appropriate levels of support, regardless of reputational advantage.
61. It is also less off-putting to SMEs and smaller HEIs who often do not need huge multi-million pound interventions in order to achieve positive social and economic benefits for their communities. They have to operate with great efficiency and effectiveness to survive.
62. Exclusively large grants and brief windows for responding to calls are a challenge for many HEIs, but in particular for smaller ones. Funding to support capacity building in knowledge exchange to underpin and to build upon their already successful work is more pertinent. This acknowledgement has not been obviously included in any new funding opportunities

By using people-centred Theory of Change, Strategic Doing and Social Value

63. There is an opportunity to develop an Ecosystem Theory of Change (ToC) for the R&D system in order to develop a collective vision that multiple stakeholders buy into and then act upon. ToC enables practically daily actions to be thought-through from an overall vision. This approach could be used in developing the Roadmap overall along with each individual section. Developing this in partnership with all stakeholders will establish the collective vision and action to make it a reality.

64. This approach could be combined with Strategic Doing, a methodology that teaches people how to form collaborations quickly, move them toward measurable outcomes and make adjustments along the way: <https://strategicdoing.net/>
65. Social Value should be the way that results are measured. Social value is “the quantification of the relative importance that people place on the changes they experience in their lives. Some, but not all of this value is captured in market prices. It is important to consider and measure this social value from the perspective of those affected by an organisation’s work.”
<http://www.socialvalueuk.org/what-is-social-value/>

By seeing “pracademics” and professional staff, including knowledge brokers, as important parts of the ecosystem

66. As mentioned in other answers, practical researchers and knowledge brokers should also be seen and valued as important stakeholders.

By utilising existing and developing infrastructure and networks

67. Working with and through existing organisations such as NCUB, NCCPE, Praxis Auril, ARMA, TCCE, CBI, GuildHE and UUK is important to generate enthusiasm and support for the roadmap across the R&D ecosystem. We will commit to working with government to achieve its vision for R&D in the UK.

Words: 476