Priority knowledge/skill

Which high-level knowledge/skill, that is both strategically important and one that requires intervention to improve the UK's social science capability and/or capacity, do you want to tell us about? (enter one knowledge/skill only) *

Please provide a summary of the knowledge/skill. Maximum of 1000 words. *

Quantitative data analysis and statistics skills embracing:

-the ability to locate access manage and manipulate data collected for the purposes of analysis,

-the ability to harvest of digital traces of social behaviour, including administrative and transactional records and social media

-the ability to analyse data using the most appropriate multivariate approaches, and evaluate the robustness of such analyses and likely sources of error

-the ability to deal with digital data in new and unconventional formats, such as lack of structure, high volume or velocity

-the ability to exploit visualisation to make complex results understandable to relevant non-expert audiences

Evidence of need for increased capability and/or capacity

Please provide evidence to support the need for intervention or investment to improve the UK's social science capability and/or capacity. Should include reference/hyperlinks to supporting information, for example - reports, reviews, publications, feedback, data etc. Supporting information constitutes an important component of the call for evidence, knowledge and skills needs that are not appropriately evidenced are likely to be discounted. Maximum of 1000 words. *

Quantitative skills of all kinds continue to be in short supply in almost all areas of UK social science except Economics and Experimental psychology. As well as the surveys undertaken by the ESRC's Strategic Advisor for QM (MacInnes 2010, 2015), evidence for this comes from the breakdown by discipline of registered users of the UK Data Service (UKDS also curates non-quantitative data but this accounts for only a small proportion of data usage). Economics, Business & Management studies alone accounts for as many users as all remaining social science disciplines together. The relative weakness in quantitative skills of UK Social science was commented on by each of the three international reviews commissioned by ESRC into Sociology, Politics and International studies and Human Geography. Further evidence comes from the substantial proportion of appointments from Europe and North America made to posts in the Q-Step programme. Finally, the proportion of articles in the leading UK sociology journals using any kind of quantitate evidence is low and similar to that of fifty years ago (MacInnes et al, unpublished paper). UK life sciences journals often publish articles using innovative statistical approaches. The same, unfortunately, cannot be said for UK social science journals.

While the Q-Step programme is doing an excellent job of securing a pipeline of graduates with good quantitative skills available for postgraduate study, it is not clear yet that DTPs are meeting the challenge of providing a wide range of advanced training for such graduates. Edinburgh Q-Step centre found that there were few good UK PG study destinations for its first cohort of graduates, and that these faced

competition from attractive private and public sector job opportunities. There is thus a continuing need to increase the proportion of university social science teachers with good quantitative skills, and to ensure that postgraduates who may go on to become such teachers have a robust knowledge of them. This will also help meet the rising demand for such skills in the economy flowing from the data revolution.

Evidence of strategic importance

Please provide evidence for the strategic importance of the knowledge/skill. Responses should include reference supporting information for example link to ESRC Strategy, Industrial Strategy, or Global Challenges Research Fund, and refer to the main 'end-users'/beneficiaries of the expertise. Please explain whether and why it is strategically important for the knowledge and skills needs to be enhanced in the UK.Maximum of 1000 words. *

Its is now clear that we are living through a data revolution, whereby almost all areas of economy and society both produce unprecedented amounts of data that can be harvested for further analysis, and are also informed by better, higher quality data that has been purposely collected with analysis in mind. The techUK *Big Data Skills working group* estimated in its 2016 report that 'The big data revolution is expected to add £241 billion to UK GDP by 2020 as well as creating 157,000 additional jobs.' It argued that Data Analysts and Data Scientists 'should feature prominently on any future Government preferred shortage occupation list'.
https://www.techuk.org/insights/reports/item/9469-the-uk-s-big-data-future-mind-the-gap

Gartner, Inc.'s *Predicts 2016: Information Strategy report* found that the number of large organisations having a Chief Data Officer more than doubled between 2014 and 2015 and forecast that 90% of large organisations would have one by 2019. *NESTA's Data Skills for the Future* report (2017) emphaisises the role that universities can play, and a key role for the social sciences. It noted that the appointment of senior executives to champion the use of data and analytics was essential to foster the right environment for exploiting data skills, and for the wider adoption of a data-driven approach to decision-making, and highlighted the importance of *higher education* in producing managers and professionals with both the right skills and mindset: 'As this report highlights, educating as broadly as possible is essential. We need a population that understands the opportunities provided by digital (and data in particular). We want them to be able to actively engage with the digital market, and be willing to trust the complex and new digital world. Achieving that requires teachers who can both inspire and inform future generations, as well as enlighten those who feel left behind by the ever-quickening digital revolution. We need to help existing managers–at all levels–get comfortable with and embrace data and analytics. They may not become 'data natives' or experts themselves, but they need to embrace the advantages of data and analytics. So, education is important here, especially to create a bridge between the data science and traditional business worlds.'
(https://www.accenture.com/t00010101T000000Z__w__/gb-en/_acnmedia/PDF-60/Accenture-Data-Skills-For-The-Future.pdf#zoom=50

THUs CPD

The UK government's *Industrial Strategy Green Paper* noted that academic research in data science and data analysis 'have practical benefits for our economy, with firms investing into the UK to access our research – such as IBM, which has invested £200 million in the Hartree Centre in Cheshire to boost 'big data' research. ' (25) and that '… much of the UK's current and future prosperity depends also on our ability to exploit technology and to ensure our data and networks are secure against the many threats we face. (17) It noted how government data, such as HMRC data might be used 'in a smarter way' were data science brought together with social scientists such as behavioural insights experts to harvest information, build up networks and support a business led Productivity Council.

One example of an entirely new social science research field made possible by new forms of data is that of epigenetics and 'sociogenomics' where genetic influences on behaviour can be investigated and measured, as in the ESRC NCRM Sociogenome project.

While perception of the data revolution has focused on 'Big Data', new sources of digital information such as social media, or very high volume data of the kind produced by webscraping. However just as important, and usually underestimated, is the increase in volume and quality of conventional survey and administrative data. For example the level of detail on type of work, qualifications, skills, health and well being and family structure collected by the UK Labour Force Survey is vastly improved compared to only a decade ago. Researchers now potentially have access to HMRC and other administrative data that was unavailable until recently.

In short there is a growing demand for quantitative data analysis skills, both within higher education social science and beyond.

Current interventions

Please provide evidence of any relevant interventions (that you are aware of) by funders, institutions, companies or professional societies. Please be as specific as possible including timing and scale of intervention, career stage and consider all appropriate types/modes of intervention, including for example training courses and positions, changes to funding policies, secondments, discipline hopping grants, interdisciplinary centres, workshops, networking events, Continuing Professional Development (CPD), summer schools, etc.Maximum of 500 words. *

The ESRC's existing investment, NCRM and former investment, AQMeN have played a significant role in sustaining and increasing capacity in quantitative skill, especially at PG and post doc levels. The British Academy High Level Strategy group and NESTA Data Skills working group have been important in collecting and interpreting evidence about the supply and demand for data analysis skills, but have no direct capacity building role.

Suggested actions

For the suggested priority area, describe and evidence what action(s) could be taken forward by ESRC (in partnership with others, where appropriate) to support the efforts identified in question 2.4. This should be supported by evidence as to

the efficacy of the suggestions for example how/where/when the suggestion(s) has worked before. Please be a specific as possible, for example - describe the type or mode of support which would be most appropriate to deliver the identified priority area, the scale of intervention and stage of career. This is an opportunity to consider different models of delivery such as, options beyond the more commonly-funded 'training' approaches. Maximum of 500 words. *

In its training phase, focussed on Scotland, AQMeN developed a training model that combined CPD training events together with follow up after training, including a network for advice and support, that brought together HE with the public and private sectors. With relatively modest funding this model would be rolled out on a UK basis and complement the shorter term focused activities of NCRM.

Timeliness of action(s)

Please outline any additional information that evidences the impact of the ESRC not investing in the suggested priority area at this time. Why is it timely to act now? Does the UK's have capacity to deliver suggested action(s) now? Maximum of 500 words. *

Two factors make this timely. One is Brexit. We know that , in part because of the different traditions of maths education and emphasis on quant skills in HE social science in other countries, many of those with quants skills in UK HE are from Europe and North America. This source of skills supply is therefore vulnerable to any changed perception of the UK as a desirable place to build a career. The other is the pipeline of graduates coming forward with good quants skills produced by the Q-Step programme. At the University of Edinburgh we were struck by two features of the opportunities our first cohort of graduates faced: (1) they had a ready demand for their skills from both the public and private sectors and both the UK and internationally (2) there were few UK PG destinations where they would access training in skills significantly more advanced than those they already possessed.

Partnership

Please evidence the opportunities, relevant to this priority area, to create partnerships with business, policy and/or the third sector, with potential to leverage additional investment.Maximum of 500 words. *

Awards with time spent elsewhere??

Given the community of interest in improving quantitative skills between HE and business, policy and public sectors there are opportunities for working together. The Royal Statistical Society‘s work on Statistical Literacy makes it a potential partner. The ESRC might also explore with the EPSRC ways of ensuring that within HE there are good links between those working in Statistics departments and social science departments. CPD for staff in HE might also provide opportunities for developing CPD for those working in the private, public and third sectors.

Please provide any additional information or comments. Maximum of 200 words. *

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6669	**Economics, business, management, accounting & finance.**
2457	**STEM subjects**
2123	Sociology
1610	Geography
1163	Humanities subjects
1154	Medicine & allied subjects
794	Politics and International Studies
745	Psychology
619	Social Policy and Administration
432	Education
241	Town and Country Planning
223	Environmental Sciences
221	Administration
163	Social Work
131	Anthropology

Source: UKDS database