



# Programme Background

Promoting a step-change in the quantitative skills of social science undergraduates

**Background to a new £15.5 million funding programme from the Nuffield Foundation, the Economic and Social Research Council (ESRC) and the Higher Education Funding Council for England (HEFCE)**

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## 1 Introduction

The Quantitative Methods (QM) Programme aims to promote a step-change in quantitative methods training for UK social science undergraduates.<sup>1</sup> It is funded by the Nuffield Foundation, the Economic and Social Research Council (ESRC) and the Higher Education Funding Council for England (HEFCE) and is based on a shared strategic concern about the issue. The £15.5 million programme will promote institutional change; produce a first cohort of quantitatively skilled undergraduates; and create links between undergraduate and postgraduate training. Its ultimate purpose is to benefit academic research and meet the needs of the wider labour market.

The UK has a shortage of social scientists trained in quantitative methods and consequently is unable to meet the demand from employers across all sectors – academia, government, charities and business – for staff who can apply such methods to evaluating evidence and analysing data. This deficit, caused primarily by market failure to attract students and teachers into quantitative social science training, will not be improved without targeted investment.

This Quantitative Methods (QM) Programme is a response. It is designed to support and build upon other initiatives from the Nuffield Foundation, ESRC, HEFCE, the British Academy and the Royal Statistical Society (RSS) and others to improve the UK's longstanding weakness in providing quantitative understanding across all stages of the educational life course, from secondary school to postgraduate level.

The QM Programme aims to generate sustainable institutional change that will increase the critical mass of quantitatively skilled social scientists in UK universities. It will fund training and other activities that will lead to the creation of a substantial cohort of quantitatively-trained undergraduates, across a range of social science disciplines. Some of these students may progress to postgraduate work. It also aims to ensure that funded institutions are encouraged to consider the issues at a strategic level, and to commit themselves to supporting the changes in the longer term, after the initial five-year funding.

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<sup>1</sup> HEFCE's funding is restricted to activities in England but funding from ESRC and Nuffield Foundation is unrestricted, and will be used to fund other English centres, and any centres in Northern Ireland, Scotland and Wales. The funding partnership enables support for activities across the UK.

Equally importantly, the initiative is designed to signal to a wide range of stakeholders that the stress on quantitative training and the role of empirical evidence in the social sciences requires a structural shift across the educational life course. This includes links to schools; entry requirements for, and recruitment to, university degree programmes; consideration of course content in existing programmes; and the development of new programmes, or pathways within existing programmes to strengthen quantitative skills in the context of substantive problems and concepts. We believe that this will not only have a substantial positive effect on the life chances and employability of the students involved, but also on the research capacity of UK social science.

**The QM Programme is based on the empirically-informed premise that addressing this shortage of social science researchers will not be met by developing additional “stand-alone” modules of statistical training.** The aim is to support the development of new approaches that will deliver excellent and exciting training, producing undergraduates with a deeper and more secure grasp of the quantitative skills needed to address substantive questions, and excitement in using them. Funding will be available to make substantial additions to existing quantitative skills training provision at undergraduate level **in a range of disciplines other than economics and experimental psychology.**<sup>2</sup> These additions will include appropriate attention to methodology and evidence at every stage of degree programmes. They will also provide more frequent and deeper exposure to quantitative methods, and introduce a wider range of techniques embedded within the theories, research design and problems of particular substantive fields.

**These new training initiatives will be developed and delivered through a network of Quantitative Methods (QM) Centres embedded in undergraduate departments or groups of departments largely within single Higher Education Institutions (HEIs). We envisage supporting up to 15 QM Centres.**

QM Centres will be able to apply for funding of up to £350,000 a year for five years, with a smaller spend in the first year while staff recruitment is taking place. Only the most ambitious programmes will receive funding at the highest level. Actual funds awarded to each QM Centre will depend on the number of departments taking part and the diversity of additional innovative activities within them and the costs incurred.

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<sup>2</sup> See page 11 for the reasoning behind this and discussion of ways that these departments may be involved in applications from other departments.

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## 2 Summary of the Quantitative Methods Programme

The five-year QM Programme will comprise several key components.

- A network of QM Centres, developing and delivering a diverse range of training activities that:
  - Consider recruitment and training of students in a cumulative fashion.
  - Bring in additional staff and training to embed quantitative skills and a full understanding of research design at every stage of undergraduate study in the different disciplines and substantive areas, ensuring a wider range of students are trained in such methods and that students with the appropriate interests and skills are given advanced training.
  - Attract students to, and enthuse them about, careers using quantitative methods.
- A supporting programme designed to facilitate the exchange of ideas and experiences between the QM Centres, and the discussion of common issues and possible joint activities including work placements and training. For this purpose, we will organise meetings for all QM Centres to come together; once following the initial award, and twice yearly thereafter. We will also maintain a secure online network for QM Centres to communicate between meetings.
- A publicity and dissemination programme that signals the need to address the shortage of quantitative methodology skills training, and that shares the models developed by the QM Centres with HEIs outside the QM Programme. We will undertake this role via a website and through our networks and meetings with policy makers and other key stakeholders.

A steering committee of representatives from the Nuffield Foundation, ESRC, HEFCE and other key stakeholders will oversee the progress of the QM Centres and work to encourage innovation in delivering quantitative methods skills training, both within the selected QM Centres and by disseminating evidence from them to other HEIs.

## Additionality

The focus of the QM Programme, and therefore one of the key criteria used to select QM Centres is **additionality**, by which we mean:

- The provision of additional training above and beyond that which is already provided, both in terms of quality and scale.
- Training of additional numbers of students who will have a deeper understanding of the uses of quantitative methods in addressing significant substantive issues, and who will have the necessary skills to meet the needs of a wide range of employers.

## Building on existing strengths

It is unlikely that the QM Programme will achieve the degree of additionality sought within its five-year duration unless it builds on recognised existing strengths in **quantitative methods in social science within the participating HEIs**. We therefore seek applications from HEIs where there are already some existing staff with expertise in teaching quantitative skills and substantive research interests in issues that can be addressed by using quantitative methods. Similarly, there must be a demonstrable commitment on the part of applicants to build a sustainable centre of excellence with the longer term aim of improving quantitative skills in social science disciplines.

## What the QM Programme will fund

Each centre will be funded for five years<sup>3</sup> (subject to satisfactory mid-term review) to support:

- Significant additional staff time to develop and deliver quantitative training and supervise student selection for bursaries, training or internships largely by supporting up to four new full-time equivalent teaching posts to bring in appropriate additional expertise.
- A programme of activities that will both embed quantitative skills training and a deep understanding of research design within undergraduate training in the different disciplines and substantive areas, and attract and enthuse students to careers in applied research. **We encourage different approaches and experiments**, and the following are only examples of the innovative approaches we wish to foster:
  - The development of substantive courses that require acquisition of new quantitative methods skills or consolidation of existing ones.

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<sup>3</sup> Funding may be available for non-staff costs – student bursaries and internships and special development of curricula, etc. – for a second five-year period.

- The development of a progressive sequence of courses that could eventually lead to a recognised qualification or new specialised degrees such as the introduction of new “badged” qualifications or degrees in quantitative methods within the disciplines<sup>4</sup> or a recognised substantive specialism.
- The provision of hands-on learning in data labs using specially constructed datasets, or development of hypothesis testing with existing online datasets (postgraduate teaching assistant costs might be used for this).
- The development of vacation training activities, including bursaries for students to attend them, or provision for students to attend existing internal or external courses.
- The development of paid summer work placements or internships in government, independent research institutes or private sector bodies where additional hands-on experience may be acquired and other valuable experience obtained.
- The possibility of linking three-year undergraduate degrees with Master’s level provision (leading to a possible “3+1” in England and Wales). Or the consideration of linking quantitative skills training at undergraduate level with specialist Master’s courses. For example, by awarding bursaries to students who have been part of the QM Programme to do a specialist Master’s course.

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### 3 Background and rationale for the Quantitative Methods Programme

The Nuffield Foundation, ESRC and HEFCE have been concerned for several years about the relative decline in the number of postgraduate students with high level quantitative skills in subjects other than economics and experimental psychology. It has become increasingly apparent that in most UK social science disciplines, quantitative work forms a small and decreasing proportion of the work being done by new career researchers.

Yet these skills are increasingly in demand. Understanding research design and the role of experiment and structured empirical observation and then critically analysing results is part of a healthy social science community. It is increasingly important in addressing key social science questions across a range of disciplines. Both the business sector and the civil service also require these skills in their employees.

The ESRC and others have put in place funding for a suite of large-scale datasets (cohort studies, longitudinal studies, repeated cross-sectional studies such as election studies and social attitudes studies, and a range of *ad hoc* studies) that are virtually

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<sup>4</sup> For instance, along the lines being developed by the British Academy or by kite-marking via the Royal Statistical Society qualification.

unparalleled elsewhere. But without the requisite skills in the UK social science community, these datasets will be underused or mainly used by people outside the UK, and consequently the data will not be used to address pressing policy questions as well as social science theories.

### **The Nuffield Foundation**

The Nuffield Foundation has seen a rise in the number of “repeat players” in its grant-making, as there are only a small number of people actively working on many of the large datasets that span our areas of interest. These include (but are not restricted to) the birth cohort studies, household and other longitudinal studies and various ONS and government department datasets, including the potential use of administrative data. Furthermore, the Foundation has recently commissioned various studies from economists on issues where other social scientists, with different substantive expertise, might usefully have been involved. And there are some fields (family sociology, empirical research in law, and education for example) where the Foundation is intensely aware of how few active researchers are engaged in quantitative work to examine problems that require quantitative analysis, either descriptive or explanatory.

### **Higher Education Funding Council for England (HEFCE)**

HEFCE has engaged with quantitative social science since 2005, when the report of its first Strategically Important and Vulnerable Subjects (SIVS) Advisory Group recommended that this area should be considered strategically important and vulnerable and that HEFCE should take action with other stakeholders such as ESRC to address this.

Since 2008 HEFCE has invested £4 million, with ESRC, in pilot projects and related initiatives in quantitative methods. This work has served to test different approaches to promoting quantitative methods and enabled systematic analysis of the landscape through the leadership of Professor John Maclnnes, a social demographer at the University of Edinburgh.

In 2011 the government asked HEFCE to consider what support may be required for subjects that are strategically important and vulnerable in order to avoid undesirable reductions in the scale of provision. HEFCE’s revised SIVS policy in the new HE funding landscape from 2012 focuses on risks to the future availability of any subject and, where necessary, HEFCE will make collaborative interventions with other funders and stakeholders to address risks. HEFCE’s investment of £5 million in this initiative is part of its response to supporting subjects at risk.



## The Economic and Social Research Council (ESRC)

The ESRC too has had a longstanding concern about this issue. Over the years, it has made various efforts to strengthen the quantitative training provided at postgraduate level, both in the development of the requirements for the 3+1 degree, and in the criteria used for commissioning Doctoral Training Centres. In 2005, the ESRC Training and Development Board commissioned its *Demographic Review of the UK Social Sciences* which showed that in many disciplines quantitative skills were concentrated in older researchers and so the shortfall in such skills would get worse over time.

In 2009 the ESRC commissioned a further report from Professor John Maclnnes, looking at undergraduate training.<sup>5</sup> Professor Maclnnes has since become the ESRC's Strategic Advisor for QM Training, and is leading a range of activities to promote quantitative methods training at undergraduate level.

Professor Maclnnes' 2009 report, *Proposals to support and improve the teaching of quantitative research methods at undergraduate level in the UK*, documents the extent to which undergraduate training in quantitative skills in many social science disciplines usually takes place over a few weeks in a single methods module, which spans both quantitative and qualitative skills. Students rarely have the sustained engagement with quantitative methods to develop confidence in their use or appreciation of how they may be used in a substantively interesting context. There is too much emphasis on primary data collection, and not enough on secondary data analysis. Overall, there is insufficient attention in many degree programmes to the role of empirical evidence, its construction, analysis and evaluation to test concepts or explanations. There is now ample evidence of a generic deficit in quantitative skills in UK university social science; several recent ESRC-commissioned international 'benchmarking' reviews have also come to the same conclusion.

## Recent projects to improve quantitative skills

A range of projects and initiatives have been funded by the Nuffield Foundation, ESRC, HEFCE, the British Academy and the Royal Statistical Society (RSS) to improve the long-standing weakness of the UK in providing quantitative understanding across all stages of education from secondary school to postgraduate level:

- In 2010, the Nuffield Foundation commissioned Dr Jeremy Hodgen to undertake an international comparison of upper secondary mathematics policy and participation. His report, *Is the UK an outlier? An international comparison of upper secondary mathematics education*, showed that out of 24 comparable countries, England, Wales and Northern Ireland had the lowest level of participation in upper secondary mathematics. They were the *only* countries in which fewer than 20% of upper secondary students study mathematics. Scotland had slightly

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5 [www.esrc.ac.uk/\\_images/Undergraduate\\_quantitative\\_research\\_methods\\_tcm8-2722.pdf](http://www.esrc.ac.uk/_images/Undergraduate_quantitative_research_methods_tcm8-2722.pdf)

higher participation rates, but these were still below average.<sup>6</sup> In early 2013, the Foundation will publish a follow-up report which will look in detail at a smaller number of “mathematically successful” education systems and make comparisons with the education system in England and Wales.<sup>7</sup>

- In 2012, the Nuffield Foundation published findings from its project to analyse the extent, difficulty, and type of mathematics and statistics embedded in A level Business Studies, Computing, Economics, Geography, Psychology and Sociology.<sup>8</sup> It found that because of the differences in mathematical content between exam boards, and the further differences resulting from student choice of units and questions, it is possible for students who are ostensibly following the same course of study to have widely different levels of exposure to quantitative approaches. A parallel project undertaken by SCORE (Science Community Representing Education) into the mathematical content of science A levels also found variation according to exam board, as well as a failure to properly assess the mathematical requirements listed in the biology, chemistry and physics specifications.<sup>9</sup>
- The Advisory Committee on Mathematics Education (ACME) is consulting on different models for improving the number of people studying mathematics beyond GCSE and the options available to them (without making changes to current A level Mathematics and Further Mathematics).<sup>10</sup>
- HEFCE and ESRC have previously funded pilot projects designed to test new and different approaches to teaching quantitative methods with the aim of determining which are most effective.<sup>11</sup> A review by the ESRC Strategic Advisor on QM training made proposals to support and improve the teaching of quantitative research methods at undergraduate level.<sup>12</sup> The QM Programme builds on this work.
- The current Curriculum Innovation and Researcher Development Initiative projects funded by HEFCE, ESRC and the British Academy, together with other ESRC investments, including the Economic and Social Data Service (ESDS), are producing a range of new online teaching and learning material.<sup>13</sup>
- The British Academy has a number of initiatives in this area. It has recently published its position statement, *Society Counts*, which summarises the evidence for the deficit in quantitative skills in the social sciences and humanities, and calls for action to be taken across the board. It is also working to revise and strengthen the relevant Quality Assurance Agency (QAA) benchmarks on quantitative methods training. And finally, it is working with the Royal Statistical Society (RSS)

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6 [www.nuffieldfoundation.org/uk-outlier-upper-secondary-maths-education](http://www.nuffieldfoundation.org/uk-outlier-upper-secondary-maths-education)

7 [www.nuffieldfoundation.org/follow-outlier-report-post-16-maths-education](http://www.nuffieldfoundation.org/follow-outlier-report-post-16-maths-education)

8 [www.nuffieldfoundation.org/mathematics-level-assessments](http://www.nuffieldfoundation.org/mathematics-level-assessments)

9 [www.score-education.org/policy/qualifications-and-assessment/mathematics-in-science](http://www.score-education.org/policy/qualifications-and-assessment/mathematics-in-science)

10 [www.acme-uk.org/media/9786/acme\\_post16discussionpaperjul2012.pdf](http://www.acme-uk.org/media/9786/acme_post16discussionpaperjul2012.pdf)

11 [www.esrc.ac.uk/funding-and-guidance/tools-and-resources/research-resources/initiatives/qmi.aspx](http://www.esrc.ac.uk/funding-and-guidance/tools-and-resources/research-resources/initiatives/qmi.aspx)

12 [www.esrc.ac.uk/\\_images/Undergraduate\\_quantitative\\_research\\_methods\\_tcm8-2722.pdf](http://www.esrc.ac.uk/_images/Undergraduate_quantitative_research_methods_tcm8-2722.pdf)

13 [www.esrc.ac.uk/funding-and-guidance/funding-opportunities/15407/latest-opportunity-13.aspx](http://www.esrc.ac.uk/funding-and-guidance/funding-opportunities/15407/latest-opportunity-13.aspx)

and other stakeholders to develop a national system of recognition of degrees with appropriate emphasis on quantitative skills and social statistics to signal their value in the labour market to students and employers.<sup>14</sup>

- In June 2012 the Higher Education Academy held a teaching and learning summit dedicated to the issue of quantitative methods teaching in higher education.<sup>15</sup>

These activities are all welcome, and some may lead to longer-term change, as school-level reforms and experiments are developed. Yet we are convinced that a clear strategic intervention is needed to build on these various supply-side initiatives in order to secure a step-change in capability. The QM Centres will be one route to link these supply-side changes with demand on the part of students, both at school and university, with the aim of encouraging a broader range of students to understand the importance of quantitative skills within social sciences.

### **Strategic intervention**

With so many students entering university social science with weak quantitative skills and then receiving undergraduate training that does not provide significant amounts of training in quantitative analysis, it is unsurprising that many of them stick to qualitative research methods. This in turn affects the proportions of quantitatively-trained social science undergraduates who go on to do PhDs and seek academic or other professional positions utilising quantitative methods. It also contributes to the perception among schools, guidance teachers and school students that, with the exception of economics, the social sciences are an unattractive destination for students with good maths skills.

The QM Programme is designed to stem the decline in the number of students with high level quantitative skills. We hope that the investment in a small number of HEIs with pre-existing strengths will enable those institutions to signal the importance of quantitative skills to schools, school students, and undergraduates, thus creating pathways to system change. We are convinced that without a significant strategic programme of this sort, HEIs will not take the necessary risks in changing recruitment, adding new courses, or developing new qualifications. Neither will they have the critical mass of staff with appropriate expertise to deliver more than the current generalist methods training which is too short and too superficial to transmit sufficient skills and understanding.

### **An experimental approach**

We recognise that this is to some degree an experimental approach. Following the commissioning process, we will work closely with the QM Centres, both individually and

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14 [www.britac.ac.uk/policy/Quantitative\\_Skills.cfm](http://www.britac.ac.uk/policy/Quantitative_Skills.cfm)

15 [www.heacademy.ac.uk/resources/detail/events/SS\\_Summit\\_2012\\_MaInnes](http://www.heacademy.ac.uk/resources/detail/events/SS_Summit_2012_MaInnes).

collectively, to refine the QM Programme, and where appropriate and helpful, we will encourage co-operation to achieve the desired increase in undergraduate social scientists with quantitative skills training. We also plan to produce evidence for a wider group of universities by disseminating understanding of 'what works' in addressing this issue.

### **Economics and experimental psychology**

The QM Programme has been designed to build training in quantitative methods (including research design) in disciplines other than economics or experimental psychology; those disciplines do not show the systematic shortfall found in other social science disciplines and are not eligible for funding. Academics working in economics or experimental psychology may be involved in providing some of the generic training, or in developing courses that may be open to economists or experimental psychologists but that are aimed at undergraduates in other departments.

### **Qualitative work**

None of this means that qualitative work is unimportant or inappropriate for the examination of many problems. The Nuffield Foundation and the ESRC fund many projects that involve qualitative work, often – but not always – as part of a mixed-method design. But there is no evidence of any shortfall in those analytic skills, and in some disciplines they are predominant. As Professor MacInnes' report shows, there are complex reasons for this, but part of the explanation is the interplay between the research methods that many university staff are comfortable with, and the relatively weak quantitative skills of new undergraduates.

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## **4 Explicit evolutionary and permissive approach**

A key feature of the QM Programme is that while it is ambitious, it takes both an evolutionary and a permissive approach.

We recognise that in order to achieve institutional change, we will need to give HEIs time: first, to consider what innovation and additionality they can offer and so to develop their proposals; and second, to fill new posts and accredit new courses, qualifications, work placements and so on.

We hope some HEIs may experiment with the creation of "badged" quantitative degrees or streams within disciplines or departments (e.g. "quantitative social geography", or "quantitative sociology"), or ways of acknowledging that students who have taken a progressive suite of courses embedding quantitative methods have distinct

skills useful in a wide variety of possible careers (the British Academy and Royal Statistical Society are also working on this issue).

One model that some HEIs have suggested is a “3+1” model, moving from a three year undergraduate degree (in England, Wales and Northern Ireland) to a four year degree. This may yield a new undergraduate qualification, or the fourth year might cover much of what has traditionally been funded under a Master’s degree. In these cases, we would consider paying bursaries to encourage students to take a fourth year. If the fourth year resulted in a Master’s degree, the specialist courses could potentially be adapted for stand-alone Master’s status, and if the quantitative content was of an advanced level, bursaries could be awarded. As we are some distance from understanding the consequences of the new regime of funding undergraduate teaching in England, we recognise funding for Master’s degrees may be in flux. But if universities wish to consider a more ambitious “3+1” model,<sup>16</sup> which might link with doctoral training, we recognise that funding for bursaries for the additional postgraduate year of study is likely to be needed.<sup>17</sup>

In Scotland, where undergraduate degrees are four-year programmes and Scottish students are not charged tuition fees, the development of subsequent advanced quantitative training leading to a specially badged degree could be eligible for bursaries as a contribution to cover living costs beyond the four years.

Either of these models would give universities time to address the need for remedial skills and still bring students up to a higher level in quantitative skills in social science.

We recognise that the development of new courses and qualifications may attract a different type of school student, or that recruitment requirements might need to change. It might mean for instance that some students could be recruited with school qualifications in maths or sciences, and that more of the undergraduate degree content would be ensuring that they gained a deeper appreciation of how to think about quantitative skills and use them in social science settings that require different kinds of thinking about selection mechanisms and complex causality.

**We are not setting targets for applicants, but are asking them to articulate the kinds of additionality they plan to achieve and how they will do so.**

The purpose of holding regular meetings and forming a network of the successful QM Centres is to allow us to work with them as they put their plans into

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16 The 3+1 model is already a feature of some degrees, such as engineering, and may be referred to as an ‘Integrated Masters’. The funding for Integrated Master’s uses the undergraduate funding model rather than the current postgraduate system and thus may reduce the funding available for other undergraduates.

17 HEFCE is currently monitoring postgraduate provision as part of its work on postgraduate policy. Government is committed to maintaining the current level of funding support for postgraduate provision up to the end of 2012. However, price group D, which includes social sciences, is not funded within the current model.

action, and to ensure they remain committed to monitoring, learning and improving throughout the five years of the QM Programme.

We are seeking statements from applicants that show they have thought about the types of new courses or qualifications they are proposing to develop and the accreditation and practical requirements of doing so. The scale of effort needed to develop a centre of excellence from the current base may require the appointment of additional staff beyond those that will be funded by the QM Programme, the development of new institutional links for recruitment, and the agreement of university bodies and/or professional and industry bodies (for accreditation of new courses or wider accreditation of new qualifications). We want applicants to show that they have thought about these, and that the institution as a whole has made a strategic commitment to take part.

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## 5 Focus on excellence

Ultimately, the goal is to produce undergraduates who have a good understanding of quantitative methods, and experience in applying them, so that they are able to use appropriate quantitative skills to address substantive disciplinary or cross-disciplinary questions, and are excited by doing so.

A longer-term aim is that some of these students may go on to postgraduate work, and ultimately become the outstanding social science researchers of tomorrow. But these quantitative skills are also important to meet the needs of the wider labour market for data analysis and evaluation of evidence.

Applicants may wish to consider the extent to which any undergraduates on the QM Programme may be supported (in summer training or work placements) in the summer after their final year, as a prelude to formal postgraduate education. They might also consider links through a formal 3+1 (or equivalent) programme and about other ways of encouraging excellent students from the QM Programme to consider postgraduate work.

However we expect any postgraduate 'pipeline' to sit within a more general shift in emphasis towards greater consideration of the nature and sources of quantitative examination of empirical evidence in the social sciences, and how they relate to the substantive issues typically discussed in, for example, essay assignments.

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## 6 The provision of excellent and imaginative training

Producing excellence in quantitative skills is not just a matter of teaching statistical skills or other quantitative analytic techniques. What is needed is a way of marrying quantitative skills with a deeper understanding of the overall role of empirical evidence in the social sciences, and thus of research design (comparison and control, sampling, representativeness, bias, selection effects, etc.), of causal mechanisms, of falsification, and so on. In different disciplines or different substantive areas these issues will not only be handled differently but will also be embedded in different concrete problems. The QM Programme is looking to fund schemes that will embed a significant amount of quantitative training in the specific problems and paradigms of their disciplines, rather than simply providing a few more weeks of stand-alone 'methods' teaching.

Of course, generic training (by, for instance, statisticians or mathematical modellers) may also be part of the mix, but would not be sufficient in the formal training component of the QM Programme to yield a successful application. Simply providing a stand-alone 'methods' course is unlikely to provide the depth and range of experience we are seeking to fund. Applicants need to develop sequences of modules within courses, special courses or sequences of courses, and/or more hands-on training, built around particular topics or issues or questions that will give students a real sense of what quantitative methods can do.

There may be a role for funding visiting scholars from other HEIs or other countries to provide intensive training, either in a particular year, or during any summer placements, or to redeploy time of staff who do not normally teach undergraduates.

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## 7 Creation of new posts

As previously explained, we expect that successful applications are likely to come from HEIs with some demonstrable existing staff interest in and commitment to quantitative skills training. However, even these HEIs will be unlikely to have sufficient existing staff capacity with the skills and experience to develop and deliver a coherent programme with a critical mass of students. They are likely to need to create new posts and recruit new staff to fill them and this will be an important part of each applicant's budget. The addition of new national capacity is also an important aim of the initiative.

Re-skilling staff with a background in qualitative methodology is unlikely to result in sufficient capacity to bring about the step-change we hope for within the QM

Programme's timeframe. However, re-skilling existing staff may be a strategy HEIs themselves want to explore and fund as part of their own commitment to increase their future quantitative social science capacity work, drawing on mentoring from new and existing staff.

We appreciate that the legacy of the relative neglect of quantitative training means that it will be challenging to recruit new appropriately qualified and experienced staff. Applicants will need to describe how they would meet this challenge by, for example, developing attractive posts for potential recruits. The QM Programme also stipulates that new staff appointed should not have a heavier combined teaching and administrative load than other funded university staff.

The QM Programme will fund the appointment of up to four full-time equivalent new staff, covering their recruitment, salaries and on-costs for a five-year period (subject to a satisfactory mid-term review in 2016). Applicants will be required to commit to funding the posts themselves for an additional five years.

The aim is to recruit staff who can provide exciting and interesting undergraduate courses that are not simply 'methods courses' but that use quantitative skills to address substantive problems. This will not be done simply by recruiting statisticians who can provide core skills training.

While some of these new posts might be filled by recently qualified UK PhDs with quantitative skills (whose numbers are now gradually increasing due to capacity-building at the postgraduate level), international recruitment may be necessary (from other European countries, or from North America or elsewhere, where higher levels of quantitative skills training within disciplines are provided than is currently the norm in the UK). We hope to see proposals that focus on bringing new capacity into HEIs, with an emphasis on new-career staff, to counter the demographic trends highlighted by various ESRC reports.

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## 8 Recruitment of students

Applicants will want to consider how they might recruit students. This may include thinking about changes to recruitment requirements, or signalling a wider range of acceptable pathways applicants might take, or it may require wider outreach activities.<sup>18</sup> There is widespread evidence that most social science undergraduates arrive at university with poor quantitative skills or a lack of confidence in applying them, or both. This is partly due to the failure of the social sciences (with the

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<sup>18</sup> This could be linked to applying institutions' widening participation strategies or Office for Fair Access (OFFA) agreements.



exception of economics) to attract a large number of students with good quantitative skills, and partly due to the reluctance of the social sciences to demand higher quantitative skills of entrants. We expect applicants to think about innovative ways to make school students aware of the scope for quantitative skills in the social sciences and to encourage them to develop these skills at school. Applicants might consider whether, over time, entry requirements for at least some students should signal the desirability of taking AS or A levels in Use of Mathematics or Mathematics or (in future) newly developed courses in statistics or other A level curricula with some level of quantitative or numerical content.

The Nuffield Foundation and the ESRC are among a range of stakeholders who are pressing for the development of a wider range of A level courses offering quantitative skills. Applicants might actively seek students who do not have subject-specific A levels but wish to move from one discipline to another or from a non-social science track to a social science course. For instance, departments may wish to consider accepting students from a maths or science background who wished to make the shift to social science, or indeed how active recruitment of these students might be encouraged. All of these ideas for revised entry requirements will of course need to take into account the current policy discussions on qualifications.

In order to increase access, student recruitment should be considered alongside applicants' widening participation strategies and Office for Fair Access agreements. For instance, universities may wish to consider summer programmes or recruitment materials that signal the desirability of continuing to take quantitative options at A level, or that encourage students to consider quantitative social science to examine features of the social world. Indeed, since the subject of why students from some backgrounds are more or less likely to go to university or what 'value-added' schools or universities can do for life-chances is itself the subject of social science study, this would seem a ripe topic to explore in activities designed to widen participation.

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## 9 Supporting programme for the Quantitative Methods Centres

We will bring together all the successful applicants at the beginning of the QM Programme and at least twice-yearly thereafter, and create a secure online network for communication between meetings. This will facilitate exchange of ideas and experiences between the QM Centres, discussion of common issues and possible joint initiatives in recruitment, training and curriculum development, or work placements. A separate budget has been allocated for this.

In addition we may consider other activities (such as conferences for funded students), or requests for activities that would benefit from co-operation between QM Centres

(such as career guidance). We view this as an evolutionary programme that will be developed in part in collaboration with the QM Centres.

The QM Programme is part of our wider efforts to signal to a range of stakeholders that the emphasis on quantitative training is a structural shift, requiring widespread thinking about entry requirements to university degree programmes, consideration of course content in existing programmes and the potential for new programmes or pathways within existing programmes.

We will be responsible for a publicity and dissemination programme targeting both policy makers and the wider education community. Through a dedicated website and our own individual networks, we will highlight emerging issues and lessons from the QM Programme, and, in discussion with the QM Centres, share with other HEIs the models and/or teaching materials they have developed.

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## 10 Selection

### Eligibility

Applicants will need to demonstrate that they have an existing undergraduate training base and research environment and explain how their plans will build on current provision. They may adduce a range of evidence about this:

- The number of existing staff within the proposed QM Centre teaching quantitative methods.
- The number of quantitative methods courses in the proposed QM Centre.
- A record of research excellence (demonstrable for example through previous Research Assessment Exercise (RAE) scores and planned submission to the Research Excellence Framework (REF), or receipt of an ESRC Doctoral Training Centre award), or the number of staff and postgraduate students undertaking research utilising quantitative skills.
- A good record in sending students on to postgraduate work, especially for those applicants seeking funding for a badged stream of courses, or a 3+1 degree.

## Composition of QM Centres

It is envisaged that applications will come from departments within **single** HEIs, since that is where most undergraduate education takes place. However, if existing higher education networks can demonstrate strong grounds for joint provision of undergraduate training, applications will be considered from these linked HEIs, with one acting as the lead applicant. Applications of this nature are likely to be successful **only** if the HEIs are in close physical proximity (i.e. within the same town or city), so that students or staff can easily travel between HEIs, and if there is already some interchange showing that this is practically and structurally feasible. While we will not rule out applications for peripatetic staff shared between HEIs, one of the reasons for funding additional new staff is that they bring a critical mass for change within individual HEIs, and we think a peripatetic model would be unlikely to yield the same institutional outcomes.

QM Centres may be a single department or a group of more than one – but cannot include departments of economics or experimental psychology.<sup>19</sup> We will be flexible in consideration of ways that HEI could put forward an application spanning two or more departments. For instance this could involve seeking funding for full-time equivalent posts working between departments (sociology and demography or geography, for example) or within particular departments. Alternatively, applicants could seek funding to partially subsidise new posts, asking the QM Programme to fund half the costs of new staff recruited in more than one discipline, with the HEI picking up the other half. We believe applicants are best placed to decide the degree of commitment they are able to make, and about the best trade-off between making a thoroughgoing change to single departments (depth) and achieving a step-change in a larger number of departments (breadth). We will consider a range of arrangements as long as the degree of additionality is clear and the amount of funding sought versus the amount provided by the HEI is clear.

## Generic and cross-disciplinary training

Some of the training in multi-department QM Centres may be in the form of generic training. It may be that some training could be genuinely interdisciplinary, looking at particular substantive issues through different lenses. But much of the training will need to have a strong disciplinary base. Applicants proposing to form a QM Centre involving more than one discipline will need to address these issues in their applications.

We can see merit in cross-disciplinary or interdisciplinary training where it goes beyond the generic and focuses on using the techniques and methods of, for instance,

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<sup>19</sup> Ways in which these departments may be involved in applications from other departments are discussed on page 11 and in the generic and cross-disciplinary training section on this page.

economics or experimental psychology or statistics, to broaden the competencies of those working on issues in other disciplines. For example, training could be provided within a sociology or social policy degree that uses economic cost-benefit analyses to look at social interventions, their outcomes and their cost-benefit ratios. Training in education or social work might focus on assessing interventions through experimental or quasi-experimental designs and therefore involve training from, for instance, psychologists. We welcome imaginative proposals for this kind of training as long as it goes beyond the teaching of a single module within an undergraduate course and is embedded in a pathway of an undergraduate degree. So while economics and psychology departments may benefit from the QM Programme, the output measures specified should not include additional undergraduates in stand-alone economics or psychology departments.

### **Work placements and internships**

Applicants may include the provision of work placements or internships as part of their proposed activities. These could be in a range of workplaces such as independent research institutes, market research companies and public sector organisations. Applicants may already have links with workplaces, or they may forge new links during the course of the QM Programme. Applicants may seek funding for work placements on a 'per capita' basis, with additional resource for support of staff supervision at the work placement.

Workplaces may form partnerships with more than one QM Centre, and it may be that one workplace offers placements to students from different QM Centres on a competitive basis. Workplaces are not eligible to apply for direct funding from the QM Programme.

### **Application criteria**

Applications will be judged against the following four criteria.

#### **I. Additionality. This means both:**

- Additional theoretical training provided over and above that already available, both in quantity and quality, and additional practical experience to embed this training, either in lab settings or in work placements.
- The additional number and range of students that can be reasonably expected to emerge with this enhanced training.

Because the focus of this initiative is on undergraduate training, it will be important to consider additionality not only in terms of course attendance, success in developing skills through a progressive range of courses, and so on, but about other appropriate outcomes. For instance, the third year of an undergraduate degree is when many young social scientists begin the formal pathway towards a long-term research career. The choice of third-year projects is often directly linked to choices of further postgraduate training, either at Master's or PhD level. As Professor MacInnes' report shows, far too few of these third-year dissertations use secondary analysis (many more focus on small-scale primary data collection), and this may be an outcome measure worth considering.

Another aspect of additionality is that while grants will be made to a small number of QM Centres, we expect the QM Programme to have effects beyond the QM Centres themselves, across UK HEIs more widely. For instance, with the support of the network and websites of the ESRC, the Nuffield Foundation and learned societies, appropriate teaching materials developed by QM Centres may be made available to a wider range of university teachers. Special vacation or short-courses could, if appropriate, be made available to students from other universities. Applicants should discuss any wider additionality outside their own institution that their centre may bring directly.

## 2. Excellence and imaginativeness

A second criterion is the **excellence and imaginativeness** of applicants' proposed programmes of activities. While applicants are not expected to have all the details of all arrangements completed by the time of application (see the timetable on page 25), it is important that they show, both in narrative justification and the description of their plans, that they have a clear vision of what might be achieved with the significant funding that is available. Of course, the funding is likely to be used to create and fill new posts, but what else will the department, departments or the HEI aspire to?

For instance, how will they ensure that the new courses or curricular materials are interesting and exciting to students? What will new courses cover? Will they develop a sequence of courses or cover stand-alone topics? Will they set up data labs or workshops to provide supervised hands-on experience with data analysis? Will they develop their own (or joint) new courses for holiday training, or offer bursaries to students for existing Easter or summer school courses? Will they forge links with particular workplaces which might offer both work experience and a sense of possible future careers in quantitative social science, in government, independent research institutes or in the private sector? Will they seek to have courses kite-marked in any way (such as submission to the Royal Statistical Society exams) or develop over time "badged" degree courses offering, for instance, a degree in Quantitative Sociology or Quantitative Geography? Will they experiment with different streams of recruitment

(for instance, looking at students with different A levels who have interests in quantitative methods, or signalling to students with social science A levels that strengthened maths skills are important)?

### 3. Institutional commitment

A third criterion is **institutional commitment**. We anticipate that development of these programmes of activities may result in the building of centres of excellence that are of genuine value to HEIs over time (in terms of the REF and postgraduate teaching, as well in undergraduate teaching). Therefore indications of institutional commitment to, and support for, the QM Programme are required.

In the first instance, the QM Programme seeks an undertaking that staff appointed to new posts funded for the first five years will be supported by the HEI for at least a further five years. But the scale of effort needed to develop a centre of excellence from the current base may require the successful HEIs to invest in the appointment of additional staff beyond those funded by the QM Programme. These and other financial inputs from the HEI, as an indicator of its commitment, will also provide a way of gauging **the value for money** of the application.

Institutional support may be shown in other ways beyond the financial. What support will there be for the kinds of curriculum change deemed necessary? Has the applicant considered the likely steps needed to accredit new courses or qualifications? What will applicants do to develop new recruitment networks or outreach activities? Do they intend to broaden the quantitative skills of existing staff? Will they seek students with A levels from a wider range of backgrounds? Will they offer pre-intake training, such as sessions before the first year to refresh maths or provide other foundations? How will they demonstrate a commitment to monitor progress and see if lessons learned can have wider application within the institution?

Applicants might consider setting up a quantitative methods teaching group or body to oversee quantitative methods training provision or participation in wider networks than the QM Programme. Applicants themselves will have insight into the arrangements that may be most effective, but they should be able to demonstrate that high quality quantitative methods training is a priority for their institution, and show how progress in achieving this goal will be reviewed.

**Each Centre will have a named co-ordinator who is responsible for responding to questions about the bid and for the co-ordination and delivery of the funded activities and the further development of the Centre and the QM Programme.**

Named co-ordinators should be involved not only in administering but in actively shaping and taking part in the programme. They may be newer staff or staff at any level, but they should have departmental backing and an institutional statement of

support from their department head or, in the case of multi-department applications, from a senior representative of the university. In order to promote long-term and cumulative change, we would expect named co-ordinators to hold that role throughout the five years of funding.

#### 4. Sustainable and long-term change

We are looking for applicants with **aspirations for longer-term change that will be sustainable over time**, the fourth selection criterion. We appreciate that it will take the selected QM Centres some time to alter recruitment practices should that be necessary; get authorisation for new courses; consider whether completion of a number of these courses could lead to a certification or indeed a “badged” degree specialism; put in place links with summer schools or external courses; and arrange for possible work placements or internships where students will gain further experience in quantitative data collection, data handling or interpretation.

Applicants will need to describe the realistic aspirations for **outputs** that might be expected after the five-year funding period and the plans for sustainability of the various initiatives.

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## 11 Eligible costs

Each Centre can apply for £50,000 – £350,000<sup>20</sup> per year, although the upper limit is only applicable when the QM Centre's programme of activities is fully operational. Costs are expected to vary by year, with the first year being primarily some set-up costs (such as recruitment costs) and perhaps costs of experiments in teaching and so on. We hope that some of these early costs (for existing staff for instance) may be borne by the HEI (see below) but recognise that there will need to be funded development for a year or two before their activities are fully up and running. Otherwise, costs will vary by the exact elements for which funding is sought, and in relation to the degree of additionality and the number of students predicted to go through each programme.<sup>21</sup>

Applicants must say what they are seeking funding for, and present a full budget for the work. They should also state how much the university or departments themselves are contributing in the way of existing staff, computer labs, and so on.

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<sup>20</sup> Depending on the number of departments and the diversity of new training proposed.

<sup>21</sup> Exact rates for bursaries and living costs for students on placements are in the *Guide for Applicants*.

### **Applicants may seek funding for the following:**

- Significant additional time by the named co-ordinator to plan the HEI's activities under the QM Programme, provide quantitative training and supervise student selection for bursaries, training, or internships. Existing staff are not otherwise eligible for funding by the QM Programme, though they may of course count towards the HEI's own committed costs.
- Up to four new additional full-time equivalent posts. Recruitment, salaries and on-costs of the new posts will be funded for five years, though not estates costs or other overheads. The HEI will be asked to make a commitment that it will fund the posts for a second five-year period. These staff should have no heavier a teaching and administrative load than other funded university staff.
- Clearly specified costs associated with development of new curricular content or teaching datasets (which should then also be available for sharing at annual meetings with other QM Centres).
- Costs for appropriately skilled postgraduate or postdoctoral students who will supervise hands-on data labs or other training which is additional to existing core modules.
- Course fees and modest living expenses of students taking summer or other vacation courses. These must be clearly and explicitly linked to quantitative training (not qualitative modules), and must be expressed as a cost per student.
- Development of links with organisations that can offer short-term or summer work placements or internships, including university supervision costs, and subsidy of core costs of the organisations concerned (their own planning and supervision time).
- Bursaries for internships for summer placements at research settings, linked to a clear project or training pathway.
- A contribution to the costs of students in the fourth year of a 3+1 course, by way of a bursary or stipend; or possibly for relevant advanced Master's level courses for students who have successfully completed a sequence of quantitative courses at one of the QM Centres.
- Any other directly incurred costs related to materials, equipment or infrastructure needed by students.
- Clearly specified costs for any other proposed activities.

In addition to providing a budget setting out how much they are applying for under each of the headings above, applicants should indicate how many students they expect to take part in the additional quantitative training when their programme is



fully up and running (by year two or three of the five-year grant.) These should reflect their best estimate of the number of students they might expect to take part in different elements of the funded work. We will want to use these numbers as part of the assessment of the work of the QM Centres.

Applicants should also state how they intend to promote the activities funded by the QM Programme and encourage students to participate, and whether they envisage changing their recruitment process or requirements to bring different students into their departments.

### **Funding for start-up costs**

We recognise that the proposed activities will take time and resources to start up, and we will therefore provide a small amount of funding during the first six months before the start of the academic year 2013/14. This could include costs for the named co-ordinator's time; advertisement and recruitment of new staff and interested students; travel needed to arrange bursary or internship places; other legitimate costs (such as summer courses, support for additional data labs, work placements, etc).

As part of the application process, applicants are expected to have begun some of the planning for new courses and to have a clear idea of what they may be able to offer. Similarly, they should not wait for the start-up period to make links that may lead to work placements and so on. The time allowed for the preparation of the bid is designed to ensure that applicants are able to give sufficient thought to the steps they might take in recruitment of students and new staff, in course design and so on, and applications will be judged on the concreteness of the plans, rather than on abstract aspirations.

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## **12 Selection process**

There are two stages to the application process:

1. Written application.
2. For short-listed applicants, a possible interview with the selection committee.

All eligible applications will be sent for peer review by a panel of independent referees. The referees, who will be selected by the three funding organisations, will be social scientists working outside the UK in quantitative methods research and research training across a wide range of disciplines.

Applications will be short-listed, on the basis of referees' assessments, by a selection committee comprising a small number of international experts and representatives of the

Nuffield Foundation, the ESRC and HEFCE. If the referees have raised questions about aspects of a short-listed application, applicants may be invited to respond.

Short-listed applicants may be invited to an interview with the selection committee before final decisions are made. Following the committee stage, some applications may require a further period of discussion and refinement prior to awards being made.

As part of the grant-making process, we will agree with each successful QM Centre how to monitor progress throughout the grant, both at mid-term review after three years and at the end of five years. There will also be a review by an independent expert of the QM Programme as a whole.

### Eligibility and how to apply

Further information about eligibility and details of how to apply are available in the *Guide for Applicants*, available to download from [www.nuffieldfoundation.org/QM](http://www.nuffieldfoundation.org/QM). We will also publish a list of frequently asked questions (FAQs), which we will update throughout the application period.

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## 13 Timetable

TIMETABLE	
QM Competition announced	October 2012
Applications due	28 February 2013
Peer review and interview panels	March/April 2013
Awards made	May/ June 2013
Planning and set-up period and first joint meeting	June/ July 2013
First intake of undergraduates eligible for funding	October 2013
Second collective meeting	Autumn 2013
Three year mid-term review	Spring/summer 2016
Final eligible intake of students (possible extension if funding still available due to slow initial intake)	October 2017
Review and evaluation of the QM Programme	2018

