

# Aims and activities of the Q-Step centres



Q-Step

**A step-change in  
quantitative social  
science skills**

Funded by the  
Nuffield Foundation,  
ESRC and HEFCE

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The **Nuffield Foundation** is an endowed charitable trust that aims to improve social well-being in the widest sense. It funds research and innovation in education and social policy and also works to build capacity in education, science and social science research.

The **Economic and Social Research Council (ESRC)** is the UK’s largest organisation for funding research on economic and social issues. At any one time the ESRC supports over 4,000 researchers and postgraduate students in academic institutions and independent research institutes.

The **Higher Education Funding Council for England (HEFCE)** distributes public money for higher education to universities and colleges in England, and ensures that this money is used to deliver the greatest benefit to students and the wider public.

## Introduction

Q-Step is a £19.5 million programme designed to promote a step-change in quantitative social science training. Over a five-year period from 2013, fifteen universities across the UK are delivering specialist undergraduate programmes, including new courses, work placements and pathways to postgraduate study. Expertise and resources will be shared across the higher education sector through an accompanying support programme, which will also forge links with schools and employers.

Q-Step was developed as a strategic response to the shortage of quantitatively-skilled social science graduates. It is funded by the Nuffield Foundation, the Economic and Social Research Council (ESRC) and the Higher Education Funding Council for England (HEFCE).

This booklet presents the aims and activities of the individual Q-Step Centres, with each setting out its own plan for developing and delivering quantitative skills training that will attract students and provide them with a deeper and more secure grasp of the quantitative skills needed to evaluate evidence and analyse data within their chosen discipline.

Our support programme brings these Q-Step Centres together into a network, facilitating exchange of ideas and experience, discussion of common issues and the development of joint initiatives. The network covers the breadth of social sciences, including disciplines with less of a tradition for quantitative methodology such as social work, socio-legal studies, and social anthropology.

Q-Step Centres are developing new modules and courses, including new four-year courses equivalent to a combined Bachelors and Masters course (“3+1”), and sequences of courses leading to a new BSc or BA and/or badged qualification. Across the network, there is an emphasis on providing links to postgraduate study, and on enabling students to apply their quantitative skills to tackle substantive issues through the use of datasets and datalabs.

Some Q-Step Centres will be offering summer schools or other vacation courses, providing additional training outside of the main programmes of study. And many are developing opportunities for work or research placements so that students can put their newly acquired skills into practice in a professional environment.

Visit [www.nuffieldfoundation.org/q-step](http://www.nuffieldfoundation.org/q-step) for all the latest information on Q-Step, including links to each Centre’s webpage. To find out more about a particular Q-Step Centre, contact the relevant co-ordinator using the details in this booklet. For general Q-Step enquiries, please contact Sarah Lock, Q-Step Programme Head, on [slock@nuffieldfoundation.org](mailto:slock@nuffieldfoundation.org).

## Q-Step Centre Disciplines

Disciplines included in each Q-Step Centre's programme of activities													
Q-Step Centres	Disciplines												
	Area Studies	Criminology	Education	Environmental Planning	Human Geography & Demography	Linguistics	Management & Business Studies	Political Studies & International Relations	Social Anthropology	Social Policy	Social Work	Socio-Legal studies	Sociology
University of Bristol			✓		✓			✓		✓			✓
Cardiff University		✓	✓							✓			✓
City University London		✓						✓					✓
University of Edinburgh			✓			✓		✓		✓		✓	✓
University of Exeter	✓	✓	✓					✓	✓				✓
University of Glasgow			✓					✓		✓			✓
University of Kent		✓					✓	✓		✓		✓	✓
University of Leeds			✓		✓		✓	✓		✓		✓	✓
Manchester Metropolitan University		✓											✓
University of Manchester		✓				✓		✓					✓
University of Oxford								✓					✓
Queen's University Belfast		✓						✓		✓	✓		✓
University of Sheffield				✓	✓		✓	✓				✓	✓
University College London					✓			✓					
University of Warwick								✓					✓

## Bristol Q-Step Centre

Coordinator: **Richard Harris** - rich.harris@bris.ac.uk

The principle aim of the new Q-Step Centre at Bristol is to launch five new B.Sc. and five parallel M.Sci. programmes within the Faculty of Social Sciences and Law (here defined to include geography). These programmes are:

- B.Sc. / M.Sci. Geography with Quantitative Research Methods
- B.Sc. / M.Sci. Politics with Quantitative Research Methods
- B.Sc. / M.Sci. Sociology with Quantitative Research Methods
- B.Sc. / M.Sci. Social Policy with Quantitative Research Methods
- B.Sc. / M.Sci. Childhood Studies with Quantitative Research Methods

The first intake via UCAS will be in 2015. Our intention is to allow students to transfer on to these programmes from their current degrees from October 2014.

The key idea is that these programmes do not replace the core disciplinary training received by students in their home schools but complement it by including a component of cross-faculty, inter-disciplinary quantitative research training (averaging one third of the total content of their degrees). There will be provision for the students to progress into a fourth year thus exiting with an M.Sci. qualification, having undertaken the necessary skills training that would make them attractive recruits into the Advanced Quantitative Methods pathway of the doctoral training centre (at Bristol or elsewhere).

The new programmes will be characterised by a shared, inter-disciplinary pathway that flows from the existing ESRC / HEFCE funded year 1 open unit, 'Convincing Stories? Numbers are Evidence in the Social Sciences', to providing (in year 4) doctoral level training provision in conjunction with the South West Doctoral Training Centre. The exact content and title of the new units will be decided in consultation with new staff appointments. However, the intention is for these to be applied courses with a focus on practical work equipping students to undertake a dissertation using quantitative methods. We envisage five new 20 credit point units:

- People, places and politics: measuring and mapping 'segregation' in the UK (year 1)
- Principles of Quantitative Analysis (year 2)
- Understanding Society: Doing Social research with survey data (year 2)
- Advanced Methods for Quantitative Social Science (year 4)
- One further unit, to be confirmed (all year 4)

The general progression is from thinking and posing questions quantitatively (year 1), to using statistical methods with real-world survey data (year 2), to supporting students to do a

quantitative research project of their own (year 3), to more advanced topics such as longitudinal, spatial and/or multilevel analysis (year 4). The units will be compulsory for the new programmes but also optional for other students, maximising their potential impact.

To support this teaching, three new appointments will be made at the lecturer/senior lecturer level. Two additional posts (not funded by the Q-Step Centre but to be a part of it) at the Chair / Reader level will also be made.

There will also be greatly enhanced capacity to support students undertaking a required quantitative dissertation in year 3 (and also year 4, where applicable).

Additional activities involve forming a new Collaborative Network for Quantitative Social Science at the University of Bristol, of which the students will become a part. This Network will have a dedicated seminar series and other activities to raise the profile of quantitative social science and to engage the students with it. Opportunities and funding are available for the students to undertake short career placements in relevant agencies and businesses using quantitative methods. Bursaries are also available for students to transfer from their existing degree programmes for a fourth year of more advanced quantitative study.

Our abiding objective is simple. We do not wish to teach students quantitative skills as an adjunct to their degrees, or to teach only methods with no connections to the themes and topics that matter to the disciplines concerned. Instead, we want to nurture a body of sociologists, politics students, human geographers, policy studies students and childhood studies students who are proficient in quantitative methods, see such methods as core to their discipline, and especially at the M.Sci. levels have knowledge and expertise comparable to that being taught overseas.



## Cardiff Q-Step Centre

Coordinator: **Malcolm Williams** - WilliamsMD4@cardiff.ac.uk

Deputy: **Luke Sloan** - rich.harris@bris.ac.uk

Deputy: **Sin Yi Cheung** - CheungSY@cardiff.ac.uk

The Cardiff Q-Step Centre will build on the significant amount of quantitative pedagogical development achieved in the School of Social Sciences in the past two years. It integrates a number of teaching and learning strategies, such as the 'embedding' of methods in substantive modules and a number of research projects intended to extend our understanding of teaching and learning quantitative methods.

### The Centre has two clear aims:

- Substantially increase the quantitative competency of all of our undergraduate students, whereby on completion of their degree they will have operational skills in survey research, interpretation and manipulation of data, descriptive statistics and data analysis to the level of simple OLS regression.
- Develop an interdisciplinary BSc Social Analytics pathway that will combine a thorough training in quantitative methods with a subject specialism, such as sociology, criminology, education or social policy.

Our pedagogic strategy is a centre–periphery model, whereby we develop a core of a specialised degree that when fully operational will have an annual cohort of no more than 25 students. The periphery is developed through joint programmes with the core degree, the re-use of new modules on other programmes and, of course, a culture of quantitative social science that will be developed in both the student and academic body as a result of a critical mass of quantitative social scientists.

A further assumption is built into Cardiff Q-Step: this is that in order for the project to succeed in raising general student competency and producing a trained cohort of students with quantitative expertise, an ambitious programme of social engineering must be put in place. Part of this is through the model described above, gradually changing student perceptions and expectations of what it is to do social 'science'. However, in the medium term this is not sufficient and we see the necessity of creating a different kind of pool of students that we might recruit to BSc Social Analytics. Thus, along with the WJEC, the RSSCSE and a consortium of schools and colleges in South Wales, we will pilot a new A level qualification also provisionally known as Social Analytics.

## **Objectives of the Cardiff Q-Step Centre**

### **BSc Social Analytics**

This will constitute 80 credits per year in a three year programme with two streams: 'Design and Thinking', which concentrates on foundational and design issues in quantitative research and a second stream of 'Skills and Analysis' which will focus on data collection and statistical techniques. In the second year students will undertake a 20 credit placement with a Q-Step partner organisation and be expected to build on this with a 40 credit final year project. A third 40 credit stream of substantive modules will be taken alongside. These will be modules from other existing and new programmes, but a common feature will be the embedding of quantitative methods.

### **Quantitative Methods in the School**

This approach is multi-faceted and combines the redevelopment of existing programmes such as sociology, education and social policy to embed research methods (both quantitative and qualitative) with the development a more quantitative/scientific orientation to these programmes. To an extent this has already been achieved in **BSc Criminology**. These developments will interface with the creation of the new social analytics modules, the existing methods core and the creation of new programmes, such as **ESocial Science** that will develop new specialist quantitative modules that may be optional to the BSc Social Analytics programme.

In the past four years the School of Social Sciences and centres such as DECIPHER and WISERD have made very significant investments in developing quantitative research. DECIPHER, for example, is one of the leading UK centres for research using complex (experimental) interventions and WISERD has developed a very large capacity in the secondary analysis of large and complex datasets, particularly in education. In the past few years the School has moved from primarily undertaking qualitative research, to an emphasis on quantitative research. Thus, Cardiff students will have access to a very wide range of quantitative expertise and Q-Step will in turn be integrated (through some joint appointments) with the research centres.

### **A Level Social Analytics**

This is a pilot A2 qualification being developed with WJEC, the RSSCSE and a consortium of schools and colleges in South Wales. It will be aimed at those students with an interest in social issues and numeric analysis (we have conducted some modest pilots to test student interest) and will develop a skill set and culture that will be congenial to students joining the BSc Social Analytics programme and would be a valuable qualification in its own right, particularly for those joining other social science programmes. A dedicated lecturer will initially teach students on the programme on peripatetic basis, but will also provide CPD training to staff members in the schools and colleges to allow a move toward mainstreaming within five years. This programme is funded entirely by Cardiff University.

### **Training the trainers**

Q-Step will build on the work conducted under the ESRC RDI programme, which through a series of events, introduced teachers of quantitative methods to developments and techniques used in the US, mainland Europe and Australasia. The aim is to build future



capacity in Cardiff, but also in social science generally. Thus, in the next five years we will undertake the following:

- Quarterly workshops in quantitative methods teaching.
- An annual conference in quantitative methods teaching.
- PhD studentships in quantitative pedagogy.
- An apprenticeship post-doctoral scheme in quantitative methods (training the trainers).
- A resource of quantitative materials (and experience) that will assist the embedding of quantitative methods in substantive modules in social science programmes.
- The development of a range of open source distance learning materials (beyond simply making lecture slides available) which will be disseminated across the HE sector.

## City University London Q-Step Centre

Coordinator: **Rachel Cohen** - Rachel.Cohen.1@city.ac.uk

Deputy Coordinator: **Eric Harrison** - Eric.Harrison.2@city.ac.uk

### **Aim 1 - Data (QM) literacy for students on the following programmes:**

- Sociology (from 2014 cohort)
- Criminology (from 2014 cohort)
- Media and Sociology (from 2014 cohort)
- Criminology and Sociology (from 2014 cohort)
- International Politics (from 2015 cohort)
- International Political Economy (from 2015 cohort)

### **Key learning outcomes:**

- Understanding of the use of quantitative data in sociological and political research.
- Facility in evaluating quantitative social science analyses and quantitative claims made in the media/public sphere.
- Competence in using data analysis software and ability to manipulate data and produce tables/charts.
- Knowledge of data sources and how to access these.
- Understanding of data production.
- Understanding of key statistical topics (e.g. inference).
- Ability to relate quantitative data to substantive topics.

### ***To achieve this we will:***

- a) Introduce two required Year 1 Data Literacy modules (previously Sociology students had only one required QM module in Year 2 and IP students had none). These will cover data analysis and data production/management. Tutorials will be organised by subject so that some hands-on activities are subject-specific (e.g. criminology, sociology, media, IP).
- b) Increase optional/required QM training in Years 2 and 3.
- c) Embed QM across the curriculum (doing this by cohort, starting with Year 1 Sociology Dept from 2014/15, Year 2 Sociology and Year 1 IP in 2015/16... etc).
- d) Increase support for QM at dissertation level.
- e) Increase the visibility of QM within the School of Arts and Social Sciences.
- f) Increase the role played by extra-academic users of QM in curricula and extra-curricular activities.
- g) Include visits to survey/data organisations and highlight the use of QM in employment/careers.

### **Aim 2 - Development of QM pathways as follows:**

- Sociology with QM (from 2014 cohort)
- Criminology with QM (from 2014 cohort)

- Media and Sociology with QM (from 2014 cohort)
- Criminology and Sociology with QM (from 2014 cohort)
- [possible extension to International Politics programmes – later]

**Key learning outcomes** (additional to outcomes listed under **Aim 1**):

- Ability to produce, manage and manipulate quantitative data.
- Facility with intermediate & advanced techniques of quantitative analysis, for example comparative cross-country analysis and multi-level models.
- Experience of working with different types of real world quantitative data.
- Sensitivity to the demands of academic and extra-academic data users/producers.
- Ability to develop quantitative analysis in response to disciplinary questions.
- Ability to represent quantitative data visually, in written form and verbally.

**To achieve this we will:**

- a) Formally establish these pathways (and the modules within them) and advertise them.
- b) We are not recruiting students to these pathways directly, but will invite existing students to apply for pathways *at the end of their first year* at City University (we have defined selection criteria).
- c) We hope to have 12 students on pathways from 2014/15 cohort, rising to 25 within 4 years.
- d) Include information sessions on the pathways within the first year of studies, specifically in DL1/DL2.
- e) Students on QM pathways will be required to take three second year QM modules (including a placement module), at least one third year advanced QM module and to complete a QM dissertation.
- f) Placements will be organised with selected placement partners (inc NatCen and Project Oracle).
- g) Pathway students will be eligible to apply for a funded summer placement abroad at a survey analysis hub (four per year).
- h) Additional support for QM dissertations will be provided by a Data Resources Officer.

**New modules** (these are not final module names)

**Data Literacy 1: Reading and Interpreting Quantitative Data.** Yr 1: Focus on developing quantitative literacy. The module will adopt a problem-centred approach to quantitative methods. Hands-on data analysis and critical reading of quantitative analyses will be emphasised.

**Data Literacy 2: Producing and Managing Quantitative Data.** Yr 1: Convened by staff from the CCSS, with contributions from NatCen. The module will explore the production of surveys, data management and accessing existing data. Students will work in groups to develop a research question, produce and conduct a survey and analyse their findings. Groups will be mentored by relevant staff from NatCen/CCSS.

**Intermediate QM** Yr 2: This module develops analytic skills from DL1. Students will produce a research project on a substantive topic of their choice, using multivariate analysis.

**Data Visualisation** Yr 2: Taught by leading data visualisation academics, including Jason Dykes, from giCentre with guest lecturers from City University's world-renowned School of Journalism.

**QM Placement Module** Yr 2: One-day per week, term time, assessed placements with selected partners.

**Special Topics in QM** Yr 3: Two modules offered every year. Topics determined by staff expertise (and availability). Likely topics: Comparative Survey Analysis (with focus on ESS); longitudinal analysis; SEM.

**Dissertation** Yr 3: Redesigned to better support students using QM (required for pathway; optional for others), regular advice sessions from Data Resources Officer for all students interested in using QM. Award for best QM Dissertation employing Secondary Data.

**Embedding QM is conceived as including:**

- a) data-based lecture examples
- b) data/QM driven seminar discussion (e.g. students discuss a chart or published multivariate analysis)
- c) option/requirement to be assessed on the analysis of QM data (non-lab; e.g. interpretation of existing charts/tables)
- d) lab-based QM sessions within substantive module
- e) option/requirement to be assessed on lab-based QM assessments within substantive module

The **Sociology** embedding objectives:

- One or more of A-E in all substantive modules by the end of three years
- One or more of C-E in 30% of substantive modules by the end of five years

The **International Politics** embedding objectives:

- One or more of A-E in 60% of IP modules by the end of the five years
- One or more of C-E in at least two IP modules by the end of the five years

**Other activities:**

We will appoint three full-time academic staff. We will also introduce a QM seminar series, run bi-annual *Data Dives* in partnership with NatCen, and appoint funded postgraduate fractional tutors to support data labs.



## Edinburgh Q-Step Centre

Coordinator: **Alison Koslowski** - Alison.Koslowski@ed.ac.uk

### Key Features

- New courses available to all social science students including introducing or expanding QM in existing degrees and new degree programmes with QM.
- Work placements for students on 'with QM' degree programmes.
- Dedicated summer schools for secondary school students interested in QM in the social sciences.
- Vacation conversion course after year one for transfer to 'with QM' degree programmes.
- Strengthening existing Masters level social-science provision.

The Centre will be broad in its subject coverage, ambitious in the levels of quantitative expertise that it will seek to develop in students, and based on the university's experience of providing quantitative teaching in the social sciences at postgraduate level, and on its expertise in quantitative social research. It will be broad by including six subject areas, led by Social Policy, Sociology and Politics and International Relations, with significant course development, adjusted to student needs, in, Law, Education, and Celtic. There will be expert contributions from outside the Centre from the School of Mathematics and from Population Health Sciences.

The Centre will take advantage of the four years available in the Scottish undergraduate programme to include Years 3 and 4 courses in advanced quantitative methods in the programmes for the most quantitatively adept students and to include at least basic quantitative courses for all students in the participating programmes. It will thus aim to bring about a step-change in quantitative competence from the basic to the advanced:

- Degree programmes that currently provide no quantitative material will now require students to develop statistical literacy.
- Degree programmes that currently provide minimal quantitative material will require students to understand a comprehensive range of basic quantitative skills.
- Degree programmes that currently require students to reach a basic level of quantitative skill will now aim for intermediate skills.
- New programmes which will combine a specific social science discipline with the learning of specialised quantitative methods will take students to advanced quantitative levels.

All the new courses will combine online resources, hands-on experience of data analysis, and formal lectures. The learning will be centred on practical work with real secondary data, in well-equipped computer labs and with one-to-one advice and support. The aim will be to address real-world problems within disciplinary contexts.

## **A strategy in four parts**

### ***Part 1 – New ‘with QM’ degree programmes***

The flagship of the University of Edinburgh Q-Step centre will be the new quantitative degree programmes, producing graduates with advanced quantitative skills, to a level above that currently achieved by our MSc students. Four new degree programmes are being proposed (Social Policy with QM; Sociology with QM; Politics with QM; and International Relations with QM). Recruitment to these new programmes will be key to the success of Q-Step. One aspect of recruitment will be pre-entry summer schools for maths A level and Highers pupils. Students on the ‘with QM’ degree programmes will have access to paid eight week work placements with prestigious employers, which will greatly enhance their future employability. It will be possible for Year 1 students to ‘convert’ to the ‘with QM’ degrees in Year 2 by way of a two week funded conversion course.

New advanced quantitative methods modules will be developed for this degree programme. Cohorts from these degrees will in the future be able to undertake far more advanced work at MSc level than is currently feasible.

### ***Part 2 – Intermediate programmes which already have a core quantitative element***

The degree programmes in Social Policy and Sociology (including joint degree programmes) already require all students to take basic courses in research design and statistical analysis. We are beginning to currently embed quantitative evidence in courses across all years of study, through team members working with colleagues who have less QM expertise, and including the understanding of such evidence in assessment. In the reform proposed here, all students on these programmes will reach the level of intermediate rather than merely basic skills by the end of Year 3, thus enabling a quantitative project to be undertaken in Year 4, but not at the advanced quantitative level that would be possible in the ‘with QM’ programmes.

### ***Part 3 – Core: fields where quantitative evidence is common but where programmes do not currently have a quantitative component***

For the programmes grouped into this category (Law, Gaelic-medium Primary Teaching, Politics and IR, PE and Sport), a realistic aim is to introduce appropriate core courses. This is achievable because the substantive questions which arise in these programmes include many which are intrinsically quantitative, so that students can be motivated to seek to better understand the methods required to investigate these questions. The aim is a significant advance on the minimal level of quantitative material that is typically present in such programmes in the UK. The provision will require much re-design of existing introductory courses to embed them in the respective disciplines. Where students will have acquired that

core understanding, it will then be feasible to embed many more quantitative examples than at present in other courses which they are taking.

**Part 4 – *Basic: fields where quantitative evidence is less common***

Teaching materials will be adapted across the School to make some degree of statistical literacy a component of all pre-Honours programmes, to appeal to students with minimal mathematical background or interest. The main difference from the programmes mentioned above is that basic statistical literacy is here the most realistic aim. The practical work will emphasise interpretation and the communication of concepts – for example, how to read a paper with statistical content, and how to integrate that interpretation into discourse that is not primarily quantitative. The course will build upon the success of a new inter-disciplinary statistical literacy course that the university ran for the first time in 2012-13, but will differ from it by being systematically re-oriented for this particular group of students. It is intended that quantitative components developed for one subject area would enable analogous courses to be offered to further subject areas, such as Social Work and the general Primary Education programmes, with the content tailored to the needs of these programmes.



## Exeter Q-Step Centre

Coordinator: **Susan Banducci** - S.A.Banducci@exeter.ac.uk

The Exeter Q-Step Centre brings together five disciplines within the University's College of Social Sciences and International Studies: Politics & International Relations, Sociology, Area Studies, Education and Criminology. We will focus on embedding quantitative literacy (QL) and applied data analysis (ADA) into the social sciences curriculum at the University of Exeter, shifting the culture to one where quantitative methods training is a core mechanism for delivering research-inspired teaching, a key part of Exeter's education strategy.

The Q-Step Centre at Exeter will bring together a range of activities related to training and curriculum development in quantitative methods and develop new expertise in the delivery of undergraduate programmes in the social sciences. We aim to increase the number of graduates equipped with applied data analysis skills across a range of social science disciplines. In order to meet the objectives of increasing the number of graduates with quantitative skills and embedding our training in the curriculum, we will undertake activities in four main areas: a range of courses and modules across five disciplines; added value and specialised projects; University and college support services and students; and University and external engagement.

To support the delivery of Centre activities outlined below, we will recruit four new lecturers who apply advanced quantitative methods in their teaching and research. The lecturers will be recruited in the following areas: Criminology, Sociology, Political Science and International Relations. The new lecturers will be in post in 2014 and will contribute to programme and module development, undertake outreach, liaise with external partners and be champions of quantitative social sciences within the university and in the wider academic community.

### **Degree Courses and Modules**

The Q-Step Centre will develop and support the delivery of five new programmes. Our three undergraduate programmes are: BSc degrees in Sociology, Criminology, and Politics & International Relations. At the core of these three programmes are 180 credits of coursework that integrate quantitative methods and data analysis within substantive modules. Included within this are interdisciplinary modules on research practice and data collection in the social sciences. The BSc Sociology and the BSc Politics & International Relations are recruiting for 2014/15 and BSc Criminology will recruit for 2015/16.

Beginning in 2015, we will offer all social science students at Exeter the opportunity to undertake a 'Proficiency in Applied Data Analysis' that can be tagged onto their degree. For example, students in History, Law or Archaeology will be able to enrol in Q-Step modules to complete the proficiency and have it designated in their degree title. Finally, we are developing an integrated Masters (3+1) in Political Science that will integrate the quantitative



training at UG with advanced quantitative training in a fourth year to complete the MA. This degree is intended to prepare students for PhD level research.

We will develop a suite of new modules that will be core to the UG programmes and the integrated Masters degree. Our approach to module development is to build efficiency in teaching. There will be a cross-disciplinary module on research practice in the social sciences, and a series of discipline-based modules covering basic and intermediate data analysis. In addition to this we will deliver a range of substantive modules that integrate data analysis. To promote student engagement in the subjects and with quantitative methods, these modules will use bespoke instructional data sets and materials that will be developed with Dr Lynne Hoelter (Director of Instructional Resources at the Inter-University Consortium for Political and Social Research, University of Michigan). In addition, quantitative training Q-Step modules will be supported by weekly computer lab sessions. Students enrolled in any of the programmes will be eligible for a bursary to undertake work experience with one of our industry partners. We have agreed placement opportunities with social research agencies and a regional consulting service. These work placements and industry partnerships will be supported by a dedicated Q-Step work placement coordinator.

## Projects

We propose a number of projects to engage students with quantitative data analysis in the classroom and to promote its use across the University. **Instructional data sets**, a video series of quantitative social scientists talking about their work (Methods Matters), a **Stat Support Desk** and supplementary **workshops** (10 per year) are new projects. In Methods Matters, Dr Clare Saunders will develop a series of videocasts aimed at engaging students in social science research through listening to world renowned experts discuss their approach to the research process from idea and question formation to publication. The Stat Support Desk, staffed by research students, is aimed at providing discipline based statistical support to students on Q-Step degree programmes. Final year students will present work at a summer term research conference to be held during Exeter's Grand Challenges – a summer programme for first year students that inspires research and interdisciplinary approaches to some of our major societal issues.

## Engagement and Outreach

We will engage with students through societies (e.g. ResSoc and Students as Change Agents), regional schools (Empowering Partnerships), and the existing network of statistics support (ExISta) and the wider community (e.g. the external advisory board). There is an active student Research Society at Exeter and the president will serve on the Q-Step Centre board. In order to nurture the next generation of quantitative social scientists, Exeter Q-Step will contribute a stream on Quantitative Social Science research to the existing streams of the Empowering Partnerships, a University project aimed at inspiring school students about contemporary research. We will collaborate with the Exeter Initiative for Statistics and its Applications, the region's centre for statistical expertise which brings together statisticians working in the University and within local public and private sector organisations, to foster and promote quantitative social sciences.

## Glasgow Q-Step Centre

Interim Coordinator: **Brian Fogarty** - Brian.Fogarty@glasgow.ac.uk

Deputy Coordinator: **Chris Carman** - Christopher.Carman@glasgow.ac.uk

### 1.1 Aim:

We aim to achieve a step-change in quantitative literacy in social science through an integrated life-long learning model of working between social scientists, educationalists and mainstream statisticians at the University of Glasgow (UoG). We plan to fully exploit timely opportunities arising from the radical educational reforms currently underway in Scotland (reforms of both the school curriculum and the way teachers are trained).

### 1.2 Strategy:

- **Embed statistical numeracy** across a wide spectrum of existing courses in Social Science and Education: i.e. thoroughly integrate “4Cs” of QM (**C**ore concepts, **C**reative skills, **C**ritical thinking & **C**ollaborative working) using national/international datasets in all four years of three MA (Social Sciences) degrees (Public Policy, Sociology, Politics) and the MA (Education) degree.
- **Develop new methods courses and badged degrees:** including a coherent suite of new courses at Levels 1 to 4, leading to new “badged” degrees (e.g. *MA Quantitative Politics*, *MA Quantitative Sociology*, etc.).
- **Support, safety-nets and stepping-stones:** drawing on the success of the UoG Student Support Service for physics/engineering, we will provide an additional safety net through clinic-based one-to-one support for students, staffed by new and existing staff. We shall also provide the stepping-stones needed to help students make the transition to the next stage of quantitative learning, including: **a)** extensive use of guest lectures and live interviews with quantitative researchers to expose undergraduates to those working at the forefront of social statistics, and **b)** a carefully-structured programme of summer schools and placements.
- **Technology Enhanced Learning (TEL):** exploiting an outstanding pedigree in TEL in the School of Maths & Stats and in the School of Education, we will develop teaching resources that will not only provide excellent teaching materials for undergraduates at Glasgow, but also: **a)** share resources with other universities; **b)** use these resources to assist with on-going staff development at UoG; and **c)** potentially develop sustainable funding streams and marketing strategies - such as the development of QM CPD courses for school teachers, distance learning and MOOCs (Mass Open Online Courses).
- **Train the trainers:** developing a comprehensive programme of continuous statistical development open to all social science staff at all levels of competency, drawing on AQMEN, GSSG, SMS and emerging links with ICPSR (Michigan).

- **Outreach:** building on outstanding Widening Access initiatives developed at UoG, we will work with and develop resources for schools, encourage uptake of quantitative social science degrees, raise the numeracy of new and existing teachers, and liaise with external organizations to widen placement/sponsorship opportunities.

### 1.3 New Courses:

#### **Level 1 Quantitative Principles & Methods (QPM)**

An introduction to quantitative social research, including univariate and bivariate analysis. Embedding principles and techniques using secondary data. Outcomes: *Understand core concepts:* deriving meaning from difference, variability and change; understanding causation; research design and evidence; data measurement and exploration; analysis and interpretation of data. *Enhance creative and critical skills:* thinking critically about data and evidence; report writing; analysis in SPSS, Stata, rpanel; collaborative working.

#### **Level 2 QPM**

The transition from bivariate to multi-covariate analysis. Applications involving extensive use of secondary data. Outcomes: *Understand core concepts:* deeper understanding of causation, research design and evidence; inferring from a sample to a population; sampling distributions; controlling for confounders in multi-covariate analysis; sources of bias. *Enhance creative and critical skills:* ANOVA; simulating and measuring the uncertainty of an estimate; using hypothesis tests and confidence intervals. Randomisation: experimental and quasi-experimental methods; instrumental variables. Building multi-covariate models in SPSS/Stata; critical thinking about design, methods and interpretation; collaborative working.

**Target groups for both Level 1 and Level 2 QPM** optional to all 600+ MA (Education) and MA (Social Science) students; compulsory for MA (Quantitative Education) and MA (Quantitative Social Science) students.

#### **Level 3 & 4 “Honours” Quantitative Methods (HQM) courses**

A series of new options, available to all Level 3 & 4 MA (Social Science) and MA (Education) students who have either completed Levels 1&2, or completed Level 3 plus the PQS Summer School (priority given to those doing badged quantitative degrees). Twenty students on each course with some courses running in alternative years (students can take them in either year 3 or 4). Examples of likely HQM courses include:

- **HQM1: Longitudinal Data Analysis:** Understand and estimate: to OLS cross-sectional analysis and its limitations; cohort vs. life cycle effects; random effects panel regression. Understand: basic time series analysis and its limitations; panel data types and structures. Introduction to fixed effects panel regression. Apply diagnostics and modelling building. Interpretation and simulation. Labs: use Stata to reshape panel data; estimate cross-sectional, time series, fixed/random effects panel regressions; cohort vs. life cycle effects, postestimation commands & diagnostics.

- **HQM2: Quantitative Text Analysis (QTA):** Understand: history and background to QTA; text as data; how to test reliability and validity. Estimate inference from texts. Classic quantitative textual analysis methods. Dictionary based approaches. Text scaling; data reduction. Labs: use Stata, R, MaxQDA & WordSTAT to: summarise and analyse text; develop and test textual hypothesis; test reliability/validity; coding, dictionary-based analysis; text scaling and clustering.
- **HQM3: Spatial Analysis:** Understanding spatial data, scale, geocoding, raster vs. vector data. Measuring lengths and perimeters, different notions of distance. Ecological fallacy and the modifiable area unit problem. Spatial dependence and autocorrelation. Visualising spatial relationships and effects. Geographically weighted regression. Labs: use *OpenGeoda*, *GWR* & Stata to: analyse raster and vector spatial data (particularly outputs from ESRC AQMEN USIRP), measure distance and perimeters, estimate spatial dependence using spatial lags, gravity models; estimate geographically weighted regression; visualise spatial variables and effects.
- **HQM4: Survey Design and Analysis:** Understand and apply: statistical inference from surveys; identification of target populations; sampling frames and coverage error; sample design and sampling error; data collection methods; dealing with nonresponse in sample surveys; questions design; pilot surveys; processing survey data; ethical issues re social surveys. Labs: use Stata to analyse survey data, deal with missing values, non-random data; bootstrapping to derive robust standard errors; post-stratification; subpopulation estimation; balanced repeated replication and successive difference replication for complex survey data.
- **Possible Alternative/Addition: HQM5: Simulation and Visualisation:** Understand and apply: design of simulation research; econometric simulation methods; Monte Carlo methods; system dynamics; Queuing models; Cellular automata; multi-agent models. Labs: hands-on exercises using R, rpanel, Stata, & specialist simulation software. Comparing predicted with actual (out of sample prediction), visual representation using Cellula Automata and other simulation methods.

## Kent Q-Step Centre

Coordinator: **Ben Baumberg** - B.P.Baumberg@kent.ac.uk

Deputy Coordinator: **Trude Sundberg** - T.Sundberg@kent.ac.uk

### Aims and Objectives

The University of Kent Q-Step Centre will tackle head on the perceived difficulty and irrelevance that puts students off learning quantitative methods (QM). The centre will make QM *inspiring*, showing how QM provides new insights into all of our lives; and it will *integrate* QM into everyday teaching so that students realise QM is simply part of being a social scientist. Ultimately the majority of compulsory modules in each participating programme will have QM embedded within them.

### Training provision

To achieve a step change in QM skills, *Kent Counts* will create three new journeys through programmes in Sociology, Criminology, Social Policy, Politics, and Business Administration, covering 750 new students per year:<sup>1</sup>

- **Bronze** (60 QM credits) for all students
- **Silver** (120 credits), where students commit to a QM pathway resulting in a 'Minor' in QM. We delay this choice until the end of the first year to maximise the opportunity of students to take this path, after which students will take a two week summer school before their second year.
- **Gold** (165 credits), a new interdisciplinary BSc in Quantitative Social Science, attached to two related disciplines.

These pathways obviously involve a number of new and amended modules. This includes high-quality versions of relatively traditional modules (e.g. an introduction to regression, causal thinking, advanced QM courses), but also some more innovative new modules (a 'critical thinking' first year module not badged as methods training, a module on the use of QM in school/community settings etc.). The first new modules will begin in 2014/15, and there will be a substantial number of new modules in each of the following three years.

This will be complemented by substantial integration of QM in substantive non-methods modules. Our view is that 'statistics labs' make it hard to embed QM due to their inaccessibility and physical separation. Instead, we will invest in a new remote server system so that students can use a laptop computer to run QM analysis from any room on campus (or beyond). We are intending to launch this in Sep 2014 (though with an awareness that IT projects are often beset by delays).

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<sup>1</sup> A further 400 students in Law/Social Work will take a 'Core Skills' path.

We will provide research and work placement opportunities in professional environments on multiple occasions in Years 2-4. This will be reserved for our students on 'Gold' and 'Silver' pathways, who are at a sufficient level that the placement opportunity has a realistic chance of being meaningful and successful. Placements will primarily begin in summer 2016, and be supported by a new placements administrator and academic placements lead. We will also provide a dedicated QM support service operated by staff and PhD students, helping with both conventional courses and queries that arise in the course of placements.

We will create a pipeline to a Masters in Applied Quantitative Social Science for students on 'gold' and 'silver' QM pathways. We are aiming to introduce this as an integrated Masters course, but one that is also available as a standalone Masters degree for students with the appropriate training from other Q-Step Centres (something we are happy to collaborate with others on to enable students to switch at this stage if they want), as well as with sufficient training from elsewhere. We are intending to provide bursaries to reduce the fee level from around £9k to around £3.5k (assuming no future fee rises), and not to cap these bursaries so that they are available to any of our continuing students.

**There are two final aspects that we see as central to the success of the University of Kent Q-Step Centre: teaching innovation, and outreach/recruitment.**

We will seek to innovate in the delivery of teaching wherever possible. The innovations mentioned in our original application include the Kent Self-Study, the Kent-in-Kent initiative ('KinK'), mindfulness training before QM assessments, and the use of Tesco Clubcard data across multiple modules.

We also have a 'teaching innovation fund' to continue to experiment with new ideas across the life of the Q-Step Centre. We are both enthusiastic to learn from the innovations of other Q-Step Centres, and keen to share our own innovations with others (once we have established that they can work!). To this end, one of our new staff members will have an explicit remit to learn from others and share our own experiences with the wider community.

Equally importantly, to meet our goals, we need to work hard with secondary school/FE students to get them to choose our new programme and pathways. We will set up an annual conference for year 12 students and follow-up events in schools, and create support and new social science materials for school maths teachers to use in A(S)-level (and ultimately GCSE) Maths and related subjects. To enable this, we are investing in a 50% outreach/recruitment non-academic staff member to work exclusively on the Q-Step programme and pathways.

Finally, while there will be inevitable (and positive) elements of competition between the Q-Step Centres in some regards, we would like to stress once more that we are keen to work collaboratively with other Q-Step centres for our mutual benefit, and to make the initiative as a whole a success.



## University of Leeds

Coordinator: **Christopher Forde** – C.J.Forde@lubs.leeds.ac.uk

### Aims

The University of Leeds Q-Step Centre will be an interdisciplinary centre of excellence that will bring about a radical pedagogical change and bring new talented students into the study of social sciences. We recognise the importance of Quantitative Methods (QM) skills for graduate careers in a wide range of sectors and feeding into the postgraduate research pipeline. The University aims to bring about a step change for our students and for the discipline overall by making an active contribution to championing QM in social sciences.

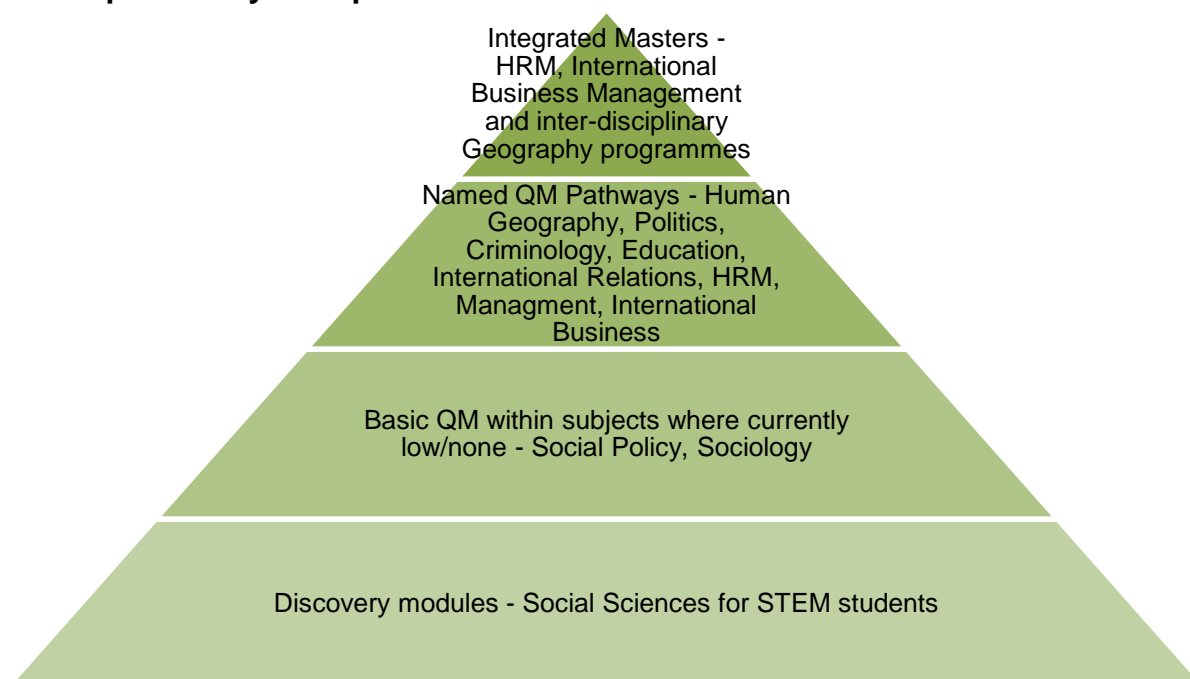
We will offer a research-based education in QM, linking to the cutting-edge work carried out through the Leeds Institute for Data Analytics (LIDA). The ESRC Consumer Data Centre will provide teachers and students with access to a unique and rich resource for learning and teaching.

### Objectives

- i. To provide an applied learning experience in QM across the social sciences that will be an exemplar for research-based education.
- ii. To facilitate direct application of QM learning specific to the Schools and their discipline focus embedding real world application of QM in the disciplines.
- iii. To provide 'additionality' in QM teaching on undergraduate programmes in the social sciences.
- iv. To create, promote and deliver jointly, a series of new bachelors with a QM pathway and integrated masters programmes with a focus on QM.
- v. To act as a resource and focal point for academic staff who need QM support in their teaching and related research in the social sciences. The long term aim to better embed QM across the UG curriculum and in research.
- vi. To provide a network and support for QM teachers across the social sciences who in some instances lack peers with QM knowledge.
- vii. To link the QM Centre with the University's mission to tackle major global challenges.
- viii. To establish and nurture beneficial working relationships with schools and school curriculum and exam boards, to create the pipeline into quantitative social science degree level study.
- ix. To develop a suite of discovery modules at levels 1, 2 and 3 applying QM within a social sciences context, so providing an introduction to the social sciences to students doing degrees in STEM subjects.
- x. To work with placement providers and employers to design workplace learning opportunities focused on QM and to meet the demand for QM skills in today's graduate employment market.

- xi. To support the national initiative on QM in social sciences including sharing resources regionally through White Rose Universities and nationally through the Q-Step programme in line with our policy on Open Educational Resources and Massive Online Open Courses.

### Developments by Discipline Area



### Timeline by Provision

	2014-15	2015-16	2016-17	2017-18
Integrated Masters	Design and approval		First students join integrated masters at start of their third year	First students graduate from the integrated masters
Named QM Pathways	Design and approval	Students transfer into Pathway Programmes	First students graduate from Pathway Programmes	
Basic QM provision	Design and approval	Embedded into year 1 of UG degrees where currently little or no provision	Embedded into year 2 of UG degrees where currently little or no provision	Embedded into year 3 of UG degrees where currently little or no provision
Discovery modules	Design and approval	Modules delivered	Modules delivered	Modules delivered

*To ensure that students already in their first year and those joining in 2014/15 will benefit from the Q-Step programme, the first versions of the level 2 and 3 QM*



*pathway and Discovery modules will be designed without pre-requisites. As the Q-Step initiative progresses through subsequent academic cycles, the modules will be redesigned with pre-requisites to ensure vertical integration of QM skills development.*

### **Timeline for Development by Discipline Area**

	Yr 1 2014-15	Yr 2 2015-16	Yr 2016-17	Yr 2017-18
Management HRM International Business	Pathways Integrated Programmes			
Human Geography, Politics, Criminology, Education,	Basic QM Provision Pathways		Integrated Programmes	
Social Policy Sociology	Basic QM Provision		Pathways and Integrated Programmes	



Manchester  
Metropolitan  
University

## MMU Q-Step Centre

Coordinator: **Julie Scott Jones** - J.Scott@mmu.ac.uk

Deputy Coordinator: **John Goldring** - j.goldring@mmu.ac.uk

### Aims and Objectives

The Manchester Metropolitan University Q-Step Centre will build on existing strengths in quantitative pedagogy and innovation, within the Department of Sociology. It will integrate pre-existing staff training and support, which has supported curriculum innovation, with a range of strategies to encourage student engagement in and proficiency with quantitative methods.

The Centre has three central aims:

- To further increase the quantitative skills of all our undergraduates, whereby on graduation they will have a clear set of quantitative competencies, that they can clearly communicate to prospective employers and thus enhance their post-graduation career routes.
- To support student success in quantitative methods via a commitment to pedagogic innovation and research.
- To encourage our undergraduates to pursue more specialised quantitative skills training via a new postgraduate pathway in quantitative methods.

The MMU Q-Step centre has five central objectives:

### 1. **Create Clear QM Routes for undergraduates**

#### Badged Degree

We intend to establish a BSc Sociology or Criminology 'with Quantitative Analysis' (working title), which our students can choose to pursue through the selection of specific 'badged' units at each year stage. Thus all our students will enrol at year one on a generic programme, with the opportunity to 'specialise' through years two and three, via the 'badged' units.

#### Diploma

We intend to develop a standalone diploma, which will recognise those students who have passed specific QM 'badged' units, but have not pursued a full QM route. This will provide the majority of our graduates with a qualification that identifies clearly their QM skills.

## **2. Incentivise QM for students**

### QM in the Community

A suite of units will be 'badged' as belonging to this initiative. Students will conduct QM projects with a variety of organisations within Greater Manchester. This provides 'real world' experience of applying QM skills. All students involved in this will receive 'Professional skills' training, which will be accredited by MMU.

### Encouraging QM Careers

The QM in the Community scheme will encourage students to identify potential career routes, using QM. This will be further encouraged, via specific QM strands within MMU's employability activities. This will be further supported by a new PDP system that we have created with the MMU careers service, which encourages students to identify and track their QM skills.

### Rewarding QM Skills

To reward student QM work, we will hold an annual student QM research showcase and prize-giving. We will also publish the best student work in an online journal.

## **3. Provide a Life course perspective**

Our programme will support students through the academic life course; thus, we will establish an A level teachers' network and QM research days for A level students. This will support transition to undergraduate QM. We will embed QM skills into substantive units (at least 66% of all units by year 5) so that students have an opportunity to practise and develop QM skills throughout their studies. To support transition to potential graduate study we will offer a 'taster' MSc in applied quantitative social research, which will be supported by bursaries. Finally, we will offer (supported by bursaries) a new MSc in applied quantitative social research.

## **4. Support Student Success**

We will support student success through a number of strategies. First, student success requires staff success, so we will ensure that all staff are trained and QM literate. Additionally, via peer coaching, we will support staff development and teaching, so that staff feel confident in their practice. Secondly, we will encourage peer support in student lab work via a 'buddies' system. Thirdly, we will use a variety of teaching styles, technologies and modes of delivery to support all student-learning styles. Fourth, we will use diagnostic testing of numeracy to support students at key transition points. Finally, we will be running vacation 'data boot camps' to support student projects and offer opportunities for further training.

## **5. Pedagogic Innovation & Research**

The Centre is committed to trying out new ways to teach QM to students. We will disseminate good practice, both internally and externally. The Centre will also produce research outputs related to its activities.

## Manchester Q-Step Centre

Joint coordinators:

**Jackie Carter** - Jackie.Carter@manchester.ac.uk

**Mark Brown** - Mark.Brown@Manchester.ac.uk

**Objective 1 of 2: To raise the level of quantitative skills attained by all Social Science undergraduates across the range of social science degree programmes at Manchester.**

Our strategy will involve increasing the QM content of degree programmes across disciplines of Sociology, Politics, Social Anthropology, Philosophy, Criminology and Linguistics. We are committed to embedding quantitative skills across the substantive curriculum (rather than in methods modules only).

### **Curriculum development**

The programme of curriculum development includes new modules and QM embedding into existing modules.

### **New modules**

We will launch 11 new modules in the first two years of the project. All 11 incorporate hands-on learning in data-labs and will be available to students across all the participating disciplines. Level 1 modules are designed to be suitable for ALL students. Students are able to build QM skills progressively by taking more advanced options at level 2 and 3.

#### ***(Level; discipline delivering module; year of launch)***

1. Unequal Societies: Health, wellbeing and happiness (L1 Social Statistics 2013)
2. Understanding Social Media (L1 Social Statistics 2013)
3. The Mozart Effect and statistical inference (L2 Social Statistics 2013)
4. Essentials in Survey Design and Analysis (L2 Social Statistics 2013)
5. Quantitative Methods in Language Studies (L2 Linguistics 2014)
6. Social attitudes and electoral research (L 2/3 Politics 2014)
7. Changing Social Attitudes (L2/3 Sociology 2014 )
8. Modelling Social Inequality(L3 Social Statistics 2013)
9. Advanced Social Network Analysis (L3 Social Statistics 2013)
10. GIS for crime mapping (L3 Criminology 2014)
11. Dissertation (secondary analysis) (L3 Criminology 2014)

### **Embedding QM in existing substantive modules**

This continues an ongoing programme developed and piloted in a related ESRC (CI) project (16 modules are already undergoing QM embedding as part of the former project with an additional 26 modules nominated so far under Q-Step.

### **Supporting activities**

These changes to the formal curriculum will be integrated with activities to support and encourage students to develop and acquire their QM skills.

### **Data support service**

Managed and Staffed by Q-Step appointed lecturers and Graduate TAs, the service will provide QM support and advice to students and staff. A key objective will be to support students (and their supervisors) in completing dissertations using secondary analysis. Key activities of the service include a weekly drop-in clinic; bespoke workshop training, including workshops on QM dissertation design and analysis; and the development of teaching datasets.

### **QM Internships** (up to 50 a year for the duration of the funding period)

Internships are designed to incentivise the new QM modules and enable students to apply, practise and enhance their QM skills in a workplace setting, with supervision from the employer as well as from the new lectureships in Manchester. The internships will be competitive, with eligibility tied to registration on one of the new QM modules. They will be graded and matched to named modules according to the required skill set. We have flexibility in the programme but envisage an internship will typically be for a 4-6 week period in the summer (end of year 2). We have a range of organisations already committed (local, UK and international).

All shortlisted candidates will attend one of a series of 'preparation for internships' workshops as part of the recruitment process (variants of these workshops will be developed to accommodate students applying for basic, intermediary or advanced level internships), and will include refresher training and practice in the required QM skills.

### **Careers in Statistics Seminar Series**

Invited speakers from different occupations and career paths to help showcase the range of applications of QM skills and data in employment.

### **Objective 2 of 2: To increase the number of students graduating with advanced quantitative skills.**

#### **New specialist QM degree pathways (from September 2015)**

Drawing on the Advanced QM research and training expertise in the Social Statistics DA at Manchester, we are introducing the following 5 QM specialist pathways to Manchester's existing interdisciplinary degree programme **BA (Social Sciences) (BASS)**:

- Sociology and Quantitative Methods
- Politics and Quantitative Methods
- Social Anthropology and Quantitative Methods
- Criminology and Quantitative Methods
- Philosophy and Quantitative Methods

We aim to develop these pathways as feeders into our 1+3 postgraduate training programme in Social Research Methods and Statistics. The result will be a 3+1(+3) training pathway designed to train up the QM experts of the future. The pathways will be incentivised with:

- **Internships** – for students on the QM joint pathways (subject to meeting eligibility criteria)
- **Bursaries** – conditional place and bursary (conditional on a 2.1) on the MSc SRMS

### **Recruitment**

To minimise barriers, entry requirements on the new QM pathways will be kept to the standard BASS (AAB with GCSE Maths C). A series of **Pre-sessional workshops** will be run to provide refresher maths and related foundation skills as part of Induction on the QM pathways.

Our programme includes a range of outreach activities to stimulate interest in the new degree pathways among secondary school students from year 9-11. These will include '**Discovery days**' - on-campus workshops designed to showcase aspects of applied quantitative social science through problem-solving, and the use of real data and a range of software. These will include some targeting of students studying STEM subjects at A level to try and increase applications from a group with stronger QM skills who do not normally apply to the Social Sciences.



## Oxford Q-Step Centre

Interim Coordinator: **Andy Eggers** – [andrew.eggers@nuffield.ox.ac.uk](mailto:andrew.eggers@nuffield.ox.ac.uk)

### Welcome to Oxford Q-step Centre

The Department of Politics and International Relations (DPIR), in close cooperation with the Department of Sociology, will establish the Oxford Q-Step Centre. Professor Catherine de Vries serves as the Centre Coordinator and is supported by a Management Committee (consisting of David Rueda, James Tilley, Stephen Fisher and Elias Dinas), an academic (.2 FTE, Andreas Murr from DPIR) as well as an administrative coordinator (.25 FTE, Maria Moreno from DPIR). The official opening of the Oxford Q-Step Centre and the launch of its website are planned for the start of the next academic year. This document briefly outlines the aims and objectives of the Oxford Q-Step Centre for the coming five years. Yet, the teaching provision and other related activities will remain in place well beyond the initial five year lifespan of the Centre.

### Teaching provision: extending quantitative PPE & HPol at Oxford

The teaching provision of Quantitative Methods will be concentrated within our two flagship Undergraduate Programmes Politics, Philosophy and Economics (PPE) and History and Politics (HPol). The step-change in QM teaching will primarily benefit these students, but we envision widening the access of the first year QM course (detailed below) to students beyond these programmes, who are enrolled in degrees where quantitative methods feature in the current curriculum. Over time and with the active help of the Social Science Division, we anticipate that such other departments will develop enhanced advanced options, and course and thesis project opportunities, drawing on the developments being led by the Centre.

The Centre will initiate, develop and provide three core changes to our current curriculum within PPE and HPol.

1. We will introduce a new QM component into the first-year Politics curriculum with both Undergraduate Programmes. It will consist of eight lectures and four data labs per student (approximately 100 data labs in total) for all first year undergraduates studying PPE and HPOL (280 students each year). The lectures and labs will cover issues of research design, comparative method, case selection, sampling, descriptive statistics and an introduction to the basic concepts and methods of statistical estimation and hypothesis testing. This course will be primarily situated within DPIR (with the possibility of buy-in to elements of it by other departments within the social sciences and humanities divisions) as part of its compulsory teaching towards the first-year examination. It will therefore form a core part of the degree and will be recognized as such. We are currently developing the course and expect to run it from 2014 onwards.

**2.** We will develop a second year QM course for undergraduates within PPE and HPol taking courses in Comparative Government, International Relations, and Political Sociology (approximately 220 a year). This course will have a similar structure of lectures (eight in total) and data lab/workshop programmes (four in total), building on the previous course's foundations and aiming rapidly to advance students' theoretical knowledge and practical skills. In terms of research design, the lectures will outline important issues in the design of social science research such as causal and descriptive inference, measurement, and two different approaches to data collection. In terms of statistics, lectures will familiarize students with probability theory and statistical distributions, confidence intervals, hypothesis testing, analysis of variance, simple and multiple linear regression analysis as well as logistic regression. This course will form a substantial part of the teaching in these elements of the course, taken by approximately half our students, and would be recognized as a core part of final degree classifications. We are currently developing the course and expect to run it from 2015 onwards.

**3.** We will develop a thesis course to encourage students to undertake optional QM-driven research projects by providing structured opportunities to conduct research on selected data. Additionally, we will aim to develop opportunities for students to make connections with other institutions (through our internship program), enabling them to pursue data-driven research projects. This work will then be assessed as submitted dissertations and form a substantial part of the overall degree classification. We will introduce a thesis prize of £200 per annum as an incentive to encourage students to pursue QM-driven research projects, and to recognise the academic worth of such projects.

**Other activities: outreach, internships and e-teaching**

A major outreach activity will be the delivery of fully-funded, residential short course at the beginning of the summer vacation, starting in 2014. This course will be aimed at meeting the needs of external students who might otherwise be beyond the reach of the QM Programme. The second component to our outreach programme will be to work with Year 12 students and their teachers in activities which demonstrate the relevance of QM in undergraduate study and careers. We will work with existing admissions networks and will establish and deliver a short residential event for pupils who are interested in pursuing undergraduate studies or careers in a QM-focussed social science subject.

**Furthermore**, together with the University's Internship Office, we are developing a programme providing internship opportunities, within appropriate organisations both in the UK and abroad, focussing on the development of QM skills in a professional or policy context. These will give students practical experience of applying their QM skills in a workplace setting, exposing them to long-term career options at the stage of their undergraduate studies when many will be forming views about future professions. The internships will allow 8-10 students to take up a 6-12 week internship over the summer vacation.

**Finally**, we will start a QM undergraduate programme online, related to the materials used for our own teaching but designed to be used by a wider undergraduate and perhaps Year12/Year13 audience (thus complementing our school's outreach activities described above). Our expectation is that we would provide an extensive new online programme with a



mixture of podcasts, pre-recorded master classes, online teaching resources, discussion forums, downloadable datasets & problem sets.

**New staff: expanding quantitative teaching expertise**

In order to deliver the teaching outlined above, we are advertising three posts in January 2014: one in Politics; one in IR; and one in Political Sociology to commence in July 2014. We will advertise an additional post in the autumn of 2014 (to commence July 2015).

These three permanent posts will develop and deliver undergraduate teaching in QM and undertake advanced research into QM in political and social science that will provide context and application to their teaching and contribute to the development of the discipline.

In addition, we will advertise to postdoctoral positions for the five-year duration of the programme. The permanent staff and postdocs will work closely with the Centre Coordinator and Management Committee to aid in the day-to-day and long-term decision making of the Centre. These new posts will interact with existing faculty who use QM in their research or teach QM at the graduate or postgraduate level in order to help ensure close links with our graduate program.



## Queen's Q-Step Centre

Coordinator: **Mike Tomlinson** - M.Tomlinson@qub.ac.uk

Deputy Coordinator: **Emma Calvert** - e.calvert@qub.ac.uk

### Aims

The Queen's University Belfast Q-Step Centre will offer a twin-track approach to achieving a step-change in the statistical literacy and QM competency of our social science graduates through embedding QM for all students at all levels within social science undergraduate degrees as well as introducing new Joint Honours provision of QM.

Our aim is to break the traditional quantitative/qualitative divide by placing a critical appreciation of quantitative data at the heart of undergraduate social science. This will be addressed through teaching partnerships bridging quantitative and non-quantitative oriented staff, through staff training and new recruitment. In addition, we aim to change student perceptions of quantitative skills and research.

### Main objectives

#### 1. New Joint Honours in Sociology and Quantitative Research

- Joint Honours in Sociology and Quantitative Research to be introduced in 2015/6.
- Offered as 3+1 (linking with existing Masters in Social Research).
- Develop six new QM modules, providing a common block of courses (potentially optional modules for non-Joint students).
- The intention is to roll-out to other Single Honours degree programmes including Criminology and Politics. The aim is to thoroughly ground QM in the substantive discipline.

#### 2. Embedding QM in the social science curriculum

- Embed QM in substantive courses in Sociology, Criminology, Politics, Social Work and Social Policy degrees (Jan 2014 start).
- Development of two new modules with substantial QM content in Politics.
- Increased use of data labs on new and existing courses, as well as development of specially designed teaching resources including datasets.
- Initial plans include audit of existing modules and assess QM content.
- Develop teaching partnerships to enrich selected modules with QM.

#### 3. Research placements

- Research placements offered on competitive basis for Year 2 students during summer before Year 3.

- Involve employers as research partners in developing the skills of undergraduates through placements, Science Shop projects and 'day-release' dissertation-linked work.
- Will involve existing Employers' Forums from the core Schools.

#### **4. Awards for Year 3 QM dissertations**

- Q-Step Dissertation Award for QM dissertations launched Oct 2013/4 (repeated annually).
- Award of £250 offered to 15 Sociology, Criminology and Politics students undertaking Year 3 QM dissertations.
- Competitive award, based on short application form/research proposal.
- Centre Co-ordinator to work alongside dissertation supervisors to ensure adequate support and deliver student-focused workshops on using secondary sources, data manipulation and analysis etc.

#### **5. Bursaries**

- Bursaries for 3+1 Joint Honours degree and for progression to Masters in Social Research.
- Bursaries offered for research placements.

#### **6. Outreach activities**

- Visit schools and colleges as well as inviting prospective students and their parents to open days/evenings and pre-entry QM 'taster' events at Queen's.
- Integrate the social sciences with the University's on-going work with Mathematics A Level teachers, currently focused on recruitment into STEM subjects.
- Development of an interactive outward-facing website targeted at second-level students and careers teachers. Includes Twitter account @QUBQStep.

#### **Key QUB staff:**

- The Queen's Q-Step Centre is collaboration between the School of Sociology, Social Policy and Social Work, School of Politics, International Studies and Philosophy and School of Mathematics and Physics.
- Centre Co-ordinators are Mike Tomlinson and Emma Calvert (School of Sociology, Social Policy and Social Work).
- Four new FT Lectureships offered: 2 x Sociology, 1 x Politics, 1 x Statistics.
- Recruitment started across all Schools: interviews Jan 2014.



The  
University  
Of  
Sheffield.

## Sheffield Q-Step Centre

Coordinator: **Charles Pattie** - C.Pattie@sheffield.ac.uk

The Sheffield Centre brings together seven Departments within the University's Faculty of Social Sciences (Geography, Town & Regional Planning, Landscape Architecture, Law, Politics, Sociological Studies, and Management).

### Aim 1: Deliver new BA in Quantitative Social Science

We are setting up a new cross-disciplinary undergraduate degree programme (the BA QSS). This will combine substantive training in social science subjects with a rigorous grounding in QM. All students will follow a core methods curriculum, and will also specialise in one of the three substantive pathways through the degree. More specialist methods training will be delivered through the appropriate pathway. The basic model for the degree is set out below:

Year	Core	Pathway 1: Social, political & legal studies	Pathway 2: Spatial analysis, environment & visualisation	Pathway 3: Management
1	30 credits core quant methods (stats, data visualisation, survey design)  10 credits 'Conference module'	40 credits substantive pathway-specific modules  10 credits pathway-specific project module  30 credits unrestricted modules	40 credits substantive pathway-specific modules  10 credits pathway-specific project module  30 credits unrestricted modules	40 credits substantive pathway-specific modules  10 credits pathway-specific project module  30 credits unrestricted modules

Year	Core	Pathway 1: Social, political & legal studies	Pathway 2: Spatial analysis, environment & visualisation	Pathway 3: Management
2	30 credits core QM (multivariate analysis, research design)  10 credits 'Conference module'	20 credits: pathway-specific QM (analysis of panel data, time series data)  40 credits substantive pathway-specific modules  20 credits unrestricted modules	20 credits: pathway-specific QM (Spatial statistics, ML, GIS)  40 credits substantive pathway-specific modules  20 credits unrestricted modules	20 credits: pathway-specific QM (time series and econometric analysis)  40 credits substantive pathway-specific modules  20 credits unrestricted modules
3	40 credit research dissertation  20 credit 'Conference module'	40 credits substantive pathway-specific modules  20 credits unrestricted modules	40 credits substantive pathway-specific modules  20 credits unrestricted modules	40 credits substantive pathway-specific modules  20 credits unrestricted modules

Pathway-specific substantive modules will draw on modules currently taught on existing undergraduate programmes delivered by the partner departments. Unrestricted modules in each year provide space for students to either pick up on further substantive modules, or to take specialist QM modules from other pathways (e.g. students on the Management pathway taking GIS modules). Projects in years 1 and 2 of the degree, and the dissertation in year 3, will give students hands-on experience of data analysis; each year's 'conference module' will require students to prepare and deliver papers from their projects and dissertations at an annual Student Conference and a dedicated e-journal.

### **Aim 2: Establish 'State of Sheffield' survey**

As part of the BA QSS, students in each year group will be involved in running an annual 'State of Sheffield' omnibus survey. This will provide hands-on experience of survey methodology, questionnaire design and analysis. Each year, students will design question modules for inclusion in the survey, and will bid for space on the questionnaire. They will be involved in the design and delivery of the survey, and the data obtained will form the basis for project work in Years 1 and 2 (and potentially for some students' third year dissertations).

### **Aim 3: Enhance QM provision on existing degree programmes**

Different departments within the Sheffield Centre have differing levels of QM provision on existing undergraduate degrees, both depth and the number of students taking relevant

modules. QM modules for the BA QSS will also be offered to students on existing degree programmes. This will allow better core QM provision for students on degree programmes where the QM provision is currently weak, and will also allow for more specialist training to complement existing teaching in degrees with a stronger current QM element. We will start delivering material through this route a year before the first cohort of BA QSS students are recruited.

As part of this, we will encourage students on existing degrees to attend the annual BA QSS student conference and to read the e-journal. To show-case what is possible using QM (and hopefully to raise both awareness and interest).

#### **Aim 4: Embedding QM more broadly within the social sciences**

As part of Sheffield's institutional commitment to the Q-Step programme, we also aim to establish an Institute for Quantitative Social Science (IQ). This will be housed in the Faculty's new Methods Institute (which will also contain a separate qualitative methods strand). IQ will provide a hub for all social scientists using QM in the University, bringing together undergraduates, taught postgraduates, research students, and academic staff. It will provide advice surgeries, seminars and workshops, will facilitate the BA QSS annual student conference and e-journal, and will operate a 'data lab' facility (hosting, for instance, the 'State of Sheffield' survey). The intention is to provide both a focus for those already engaged on QM-related work (helping overcome potential feelings of isolation for PGRs and academics in subject areas where they may be the only QM researchers, encouraging those who do use QM to keep their method skill sets up to date, etc.), and providing advice and support for those who are not QM users but who need to develop some QM competence. It is also intended as a 'shop window' to the outside world for QM work in Sheffield.

#### **Aim 5: Enhancing employability**

We aim to build links for internships, student placements and work-experience postings within the BA QSS. Some of this will be internal to the University (Sheffield already runs a successful scheme whereby students can apply to work as RAs on staff research projects, and there is scope here for socsci students with QM skills).

#### **Aim 6: incentivising QM at postgraduate level**

We will be offering Masters bursaries to encourage strong students on the BA QSS to consider postgraduate training.



## UCL Q-Step Centre

Coordinator: **Jennifer van Heerde-Hudson** - Jennifer.hudson@ucl.ac.uk

Deputy Coordinator: **George Ploubidis** – g.ploubidis@ioe.ac.uk

Deputy Coordinator: **Slava Mikhaylov** – s.mikhaylov@ucl.ac.uk

We will develop **three new degree programmes**.

- BSc Philosophy, Political Science, and Economics (PPE). First cohort of up to 50 students in 2015 (up to half on QM stream).
- BSc Quantitative Human Geography. Our aim is to take the first cohort of approximately 20 students in September 2016.
- BSc Population Health Science. Our aim is to take the first cohort of up to 50 students in 2015.

Successful completion of the degree programmes has three components:

1. four core QM modules;
2. required optional modules with QM embedded; and
3. additional training via short courses. Core modules will be delivered by the Centre. We will adopt a 'problem driven' approach to introduce students to QM concepts. Drawing on current policy debates (e.g. participation, migration, security, inequality, health) we will design the curriculum to incorporate 3-4 topics using real data (e.g. British Election Study). Our learning model allows for development of transferrable skills like teamwork, project management/delivery, and leadership—crucial skills in today's job market. Across both core and optional modules we will familiarise students with Stata and R statistical software.

Our model, locating core training in the QMC and not participating departments, offers several advantages: it institutionalizes the Centre and its activities firmly within UCL; it encourages a multi- and inter-disciplinary approach to social science QM; it allows for (eligible) departments not identified at the start of the bid to offer QM training at later stages; and it establishes an identifiable network of QM teachers, researchers and students within UCL-IOE.

### Embedding QM Training and Skills

Experience tells us that students gain confidence in using QM with *repeated* exposure. Hence our strategy is to increase the number of opportunities students have to *practise* QM: optional modules within the programme structure, summer short courses, internship opportunities and a mentoring scheme.

### Short Courses (SC)

Short courses provide students with further opportunities to broaden and deepen QM skills. Q-Step students are required to complete four SC over the course of their degree

programme. Short courses are two days in length and will take place at both UCL and IOE. We will open up IOE-provided two-day courses to other QMCs (and possibly other HEIs without Centres at nominal cost).

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Mathematics for Social Scientists (2015)	Stata for Research
Survey Design	Longitudinal Data & Analysis
Introduction to Big Data Analytics	Insights from Data Analysis
Impact Evaluation: Effects of Policy	

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### Internships

We will offer six-week summer internships on a competitive basis to the best-qualified students as part of a package including the internship placement, two short courses and a field visit with a survey agency. Internship placements will be at UCL, IOE or with external partners where we have excellent contacts (e.g. Cabinet Office; Departments for Education, Energy & Climate Change, International Development, the Education Endowment Fund; Institute for Fiscal Studies; Sutton Trust; UPREACH). Several types of internships will be available:

1. Statistical Consultancy for External Organizations
2. Public Policy 'Think Pieces'
3. Research Assistance on Staff Projects.

### Outreach, Recruitment & Placement

UCL and IoE are well placed for recruitment activity: IoE has outstanding contacts with schools and UCL's own Academy is an obvious starting point. Working with our established outreach and recruitment offices and with learned societies who have established presentations from HEI's in schools on substantive topics (e.g. the Royal Geographical Society and Political Studies Association); we will integrate information about our QM programme into existing outreach activities. This involves developing QMC promotional materials that will be available at UCAS Fairs and similar events.

We have ambitious plans in place to create critical mass of awareness of QM programmes among prospective students. The '**QM Road Show**' will consist of presentations to A/AS-level students in schools across Great Britain followed by a Q&A session. We aim to visit 20-25 schools in years 1-4 of the programme to present examples of interesting and cutting edge QM research in a fun and accessible manner. Together with the UCL Media Relations team we will also develop a Facebook page and Twitter feed that will highlight 'QM Road Show' activities. Our presentations will also be broadcast on the **YouTube** channel created for these purposes, alongside pre-prepared presentations highlighting interdisciplinary quantitative social science.

The Centre aims to motivate and prepare students for entry into the job market and postgraduate study. Part of the Centre's remit and evidence of its success will be facilitating job placements for QM-trained students. There are four means by which we aim to achieve this. First, via formal brand-recognition on the **academic transcript/degree** itself and through **external kite-marking**. Second, our **website** and **LinkedIn profile** will be used to advertise events for the QMC network of staff and students, short courses, internship opportunities, 3+1 opportunities and relevant jobs, and job placements for our students. Third, to facilitate student interaction with the wider UCL QM community, twice annually the



QMC will host a lunchtime event where staff and students are invited to present research in 15-minute segments. These '**Bite-sized**' presentations aim to demonstrate the breadth of QM research within UCL, showcase new and innovative methods and offer an opportunity for informal networking. Finally, we plan a **student research conference** to showcase QM research starting in 2016-17 for Y2-3 students

**3+1 Schemes** Each of the participating departments have established successful Masters programmes and aim to recruit QMC students via a 3+1 bursary scheme advertised starting Y2.

**Three new posts will be recruited** to support the new Centre. The new lecturers will be responsible for delivering the four new core training modules and will offer an additional optional module with QM embedded.

- Lecturer in Quantitative Political Science
- Lecturer in Quantitative Human Geography
- Lecturer in Population Health Science

#### **Student recruitment**

- *Website* - we are currently building a new website which will be the main portal for publicity for our Centre and the new degree programmes. Our aim is to have the basic site for February 2014, building on monthly thereafter. The website will host all of our presentations given on 'Road Shows' so that students can access these.
- *Publicity* - we will be drafting copy for leaflets to leave with schools as part of Road Show activities (April 2014). Publicity documents will promote all Centres.

#### **Short course development**

- We will be planning the content of our short courses, open to all students in summer 2014. Short courses will be provided primarily by staff at IOE.
- Maths for Social Scientists (starting 2015); Stata Training for Research; Survey Design; Longitudinal Data & Analysis; Impact Evaluation: Measuring the Effect of Policy; Introduction to Big Data Analytics.

#### **Internship partners (external)**

- We will be working to identify and secure internship opportunities for students starting September 2015.

## Warwick Q-Step Centre

Joint coordinators:

**Emma Uprichard** - E.Uprichard@warwick.ac.uk

**Tak Wing Chan** – Tak-Wing.Chan@warwick.ac.uk

The **Warwick Q-Step Centre** brings together the following units and department leads:

- Department of Sociology (Dr Richard Lampard)
- Politics and International Studies (PAIS) (Dr Renske Doorenspleet)
- Centre for Interdisciplinary Methodologies (Dr Emma Uprichard, Coordinator)

### Overall mission

- To position Warwick globally as one of the leading universities of the digital age.

### Key strengths

- Five new quantitative degrees.
- Eight new permanent staff with quantitative expertise to ensure sustainability of quantitative pedagogy across Warwick social sciences over time.
- A pedagogic approach driven by problem-based learning that will enthuse students and give them confidence in their ability in quantitative methods.
- Strategic recruitment and widening participation strategy.
- A carefully staged programme of activities offering students the chance to experience 'live' research and interaction with the wider University research community.
- A strong employability strategy, including placements, building statistical literacy for the workplace and modern participatory citizenry.
- Specially designed online open source courses (Massive Open Online Courses - MOOCs) to help link undergraduate and postgraduate study.
- The opportunity for students to work on global social problems in disciplinary and interdisciplinary teams with researchers across the University.
- One-week intensive Spring Quantitative Methods Camps for UG and PG students.
- A three-week industry-based paid placement programme.
- A recruitment and widening participation strategy, focusing on narrowing the mathematics schools and colleges gap; building strong links with local and regional schools and colleges; and recruiting more mathematically able students into sociology and politics and international studies.
- Strong links to Warwick's large ESRC Doctoral Training Centre to enhance the development of training and pathways to research careers.
- Links with Warwick's existing strengths in quantitative methods in science, computing, and medicine, and links to industry to develop teaching and research at the forefront of both disciplinary and interdisciplinary quantitative methods.

- Investment in bursary support at undergraduate and postgraduate levels.

### **Key new activities to make this happen include**

#### **1) *New degrees:***

- BA Politics, International Studies and Quantitative Methods (PAIS)
- BA Sociology and Quantitative Methods (Sociology)
- MA Quantitative Research in Politics and International Studies (PAIS)
- MA Quantitative Sociological Research (Sociology)
- MSc Social Analytics (CIM)

#### **2) *Embedded quantitative methods across the curriculum***

All core and option modules on the new degrees will involve embedded quantitative methods. These modules will be available for all students in the participating departments. In addition, all undergraduate modules in both departments will be revised to include use of quantitative methods and materials to provide significant additionality.

#### **3) *Access to data***

Warwick is the only European partner in CUSP – the New York University Centre for Urban Science and Progress – a public-private partnership that uses New York City as its laboratory and classroom. CUSP's large, multi-modal data sets provide an exceptional platform for teaching and learning. Warwick is also well positioned to train students in relation to the upcoming Government data developments.

#### **4) *Advisory Board***

The Centre will have an Advisory Board comprising experts in quantitative methods from inside and outside the social sciences at Warwick, top national and international scholars, employers, and representatives of schools.