‘I’m not a quants person’; key strategies in building competence and confidence in staff who teach quantitative research methods’

Julie Scott Jones & John E. Goldring

To cite this article: Julie Scott Jones & John E. Goldring (2015) ‘I’m not a quants person’; key strategies in building competence and confidence in staff who teach quantitative research methods’, International Journal of Social Research Methodology, 18:5, 479-494, DOI: 10.1080/13645579.2015.1062623

To link to this article: https://doi.org/10.1080/13645579.2015.1062623

‘I’m not a quants person’; key strategies in building competence and confidence in staff who teach quantitative research methods’

Julie Scott Jones* and John E. Goldring

Sociology, Manchester Metropolitan University, Manchester, UK

Initiatives, like the UK ESRC’s RDI/CI programmes and the Q-Step Centres, have a long-term aim of addressing the well-documented decline in the pool of academics able and willing to teach quantitative methods (QM). However, these initiatives will take time to make an impact; therefore, the upskilling of current staff is a vital strategy if we want to maintain QM in curricula. This paper draws on findings from the ESRC RDI project, ‘No More Pointy Clicky, numbers stuff; building staff quantitative skills’. This project focussed on upskilling staff in a large Sociology department. The project was committed to delivering training to develop staff competence in QM; however, it became clear that this alone would not be sufficient to build staff confidence. Therefore, the project rolled-out a more complex strategy that addressed a range of central issues, including, pedagogy, infrastructure, Departmental resourcing and strategy, and staff worldviews, which this article explores.

Keywords: sociology; quantitative methods; teaching; pedagogy

Background – QM on the margins of British social science

The UK has one of the best-funded and largest, but underused, social science data infrastructures in the world. Its underuse is mainly due to the well documented decline in quantitative methods (henceforth QM) within UK Sociology, and a range of allied social sciences. A decline both as a component of university curricula and as empirical data to inform academic research (see British Academy, 2012; Higher Education Funding Council for England [HEFCE], 2005; Lynch et al., 2007; MacInnes, 2010; McVie, Coxon, Hawkins, Palmer, & Rice, 2008; Parker, Dobson, Scott, Wyman, & Landén, 2008; Rendall, 2003; Williams, Collett, & Rice, 2004). This decline has a multitude of reasons, including:

- a ‘cultural shift’ towards qualitative approaches since the 1960s and a privileging of theorising over empirical analysis (Blane, 2003; Parker et al., 2008);
- ongoing student dissatisfaction with what they perceive to be a ‘difficult’ subject (Williams, Payne, Hodgkinson, & Poade, 2008);
- the marketisation of UK universities, since the last 1990s and its incumbent focus on student ‘experience’ (Scott Jones & Goldring, 2014);
- declining levels of numeracy skills and rising ‘maths anxiety’ (Scott Jones & Goldring, 2014; Vorderman, Budd, Dunne, Hart, & Porkess, 2011).

*Corresponding author. Email: j.scott@mmu.ac.uk

This mixture of disciplinary fashion shifts, the emergence of the student as 'consumer' and the long-standing British 'problem' with number, impacts on the educational life course of the typical Sociology student. At A-level, which is the main introduction to the discipline for the majority of British undergraduates,[1] methods work is light on QM and mark schemes are designed in such a way that avoiding the QM questions has little overall impact on final grades (Scott Jones & Goldring, 2014). Thus on entry to university, most Sociology students do not expect to do statistical analysis as part of their degree (Williams et al., 2004, 2008) and perceive it as a marginal subject at best. Most QM is delivered within compulsory research methods modules, often jostling for space alongside qualitative methods (MacInnes, 2010) and low level QM skills predominate (Scott Jones & Goldring, 2014; Williams et al., 2008). Few degree programmes offer specialist options in QM (MacInnes, 2010; Scott Jones & Goldring, 2014; Williams et al., 2008). It is hardly surprising then that so few pursue QM at postgraduate level, with only 21% of ESRC funded projects being solely QM in approach (Economic and Social Research Council, Heads and Professors of Sociology, British Sociological Association, 2010). Consequently, the number of QM-skilled academics is low and there is a dearth of published outputs that have a QM focus; Payne, Williams, and Chamberlain (2004) reviewed the QM element in empirical articles published in the four main Sociology journals between 1999 and 2000; only 14.3% (35 of 244) of articles were quantitative and the majority (40.6%) were qualitative. Additionally, 37.7% were non-empirical and 7.4% were mixed methods. The type of QM approaches within these articles was basic, with most being univariate analysis. The *International Benchmarking Review of Sociology* (Economic and Social Research Council, Heads and Professors of Sociology, British Sociological Association, 2010) also looked at journal articles (specifically the 2008 *British Journal of Sociology*) and found that 47% of articles had a QM focus. However, of the 47% of QM articles in the *British Journal of Sociology*, only half of the first-named authors were British. Much of the reporting of the decline of QM within UK social science has focussed on curricula and research outputs.

However, one group remain the key to the future health (and growth) of QM in the UK: teachers, in both the university and secondary school sectors.[2] Such teachers will train, inspire, enthuse and encourage the next generation of QM specialists working in the UK labour market and/or academia. No amount of curriculum innovation, specialist teaching technology, and bespoke resources will solve the QM problem without effective teachers of QM.

Background – Where have all the QM teachers gone?

Sociology, in line with many other social sciences, has an ageing profile with 42% of staff aged fifty or over (British Sociological Association [BSA], 2013a; Economic and Social Research Council, Heads and Professors of Sociology, British Sociological Association, 2010; Mills et al., 2006). If we consider the decline in QM within UK social science since the 1960s, we can see the consequences of this demographic shift; the majority of QM active researchers in the UK are over fifty and a steady throughput of doctoral students is not replacing them. MacInnes (2010) estimated that around 10% of UK academics are QM specialists, who are most likely to be in senior positions and less likely to teach. According to MacInnes (2010), the UK's teaching base for QM is small and 'fragile' with around one to three QM specialists per

Department, who may or may not do any teaching. Consequently, most staff teaching QM are not specialists and have low levels of QM skills (MacInnes, 2010; Williams et al., 2004, 2008). Typically, staff perceive QM teaching to be 'difficult', partly due to their own low level of skills and partly due to student attitudes to the subject; thus the teaching is often passed on to new or junior staff (McVie et al., 2008; Williams et al., 2004). This creates a 'circle of underachievement' whereby Sociology undergraduates exposed to low levels of QM may not be taught well, often by staff with anti-QM attitudes (Gibbs, 2010). This leads them to shun the subject at postgraduate level, which in turn leads to a further decline in the subject. They may also be poor teachers of QM who communicate negativity about QM leading the students to disengage, further reinforcing poor teaching and on the cycle goes.

Vorderman et al. (2011) describes a similar 'circle of underachievement' in relation to the teaching of maths (another 'difficult' subject, with an image problem) across the educational life course from early years to secondary school. Clearly, a key lever in challenging student attitudes to QM, and encouraging them to pursue the subject post-graduation, is effective teaching by competent (in skills and knowledge) and confident teachers.

Waiting for the culture shift; the importance of upskilling

In response to the issues outlined, the ESRC, in conjunction with the British Academy, funded two programmes in 2011 consisting of twenty projects (each three years long) targeting QM at undergraduate level. One focused on curriculum innovation (ESRC CI stream) and the other on staff training (ESRC RDI stream). These projects are ending and their impact and outputs are only now emerging and being disseminated. Building on this funding is the creation in 2013 of the 15 Q-Step Centres funded by the Nuffield Foundation, the ESRC and HEFCE to address QM decline and encourage a throughput of QM-literate graduates and postgraduates. Other QM initiatives complement these large-scale funding initiatives, such as the Royal Statistical Society's 'Getstats' campaign and the British British Academy's (2012) 'Society Counts' position paper.

However, as ambitious and potentially culture changing these projects may be, they are long-term in scale; we may not see the shift for at least ten years. In addition, predicated on this model is the belief that these initiatives will disseminate good practice across the sector. There remains an immediate need to 'plug' the skills gap of those staff whose job it is to teach the current cohort of students with QM; therefore, the upskilling of staff is a vital interim strategy to deliver effective QM teaching. The upskilling of staff was a strategy adopted by several of the ESRC RDI projects, and this paper focuses on one specific project[3] that centred on the Department of Sociology at Manchester Metropolitan University (henceforth MMU).

Context – the department as a microcosm of QM in the UK

The Department of Sociology at MMU represents a microcosm of all the issues relating to the UK's 'quants problem' as outlined previously. It is one of the largest departments of Sociology in the UK (with almost 800 students across three years of study). In the academic year 2011–2012, prior to the ESRC RDI grant award, the Department taught QM to undergraduates via two compulsory research methods unit ('Understanding Social Research') and 'Practice of Social Enquiry', which later (in 2012)

became ‘Becoming a Social Researcher’. The former was a year one module, the latter, a year two module. Both modules had a split between qualitative and quantitative approaches; the former always in the first term to avoid, ‘scaring the students’ as one staff member put it. The year one module dedicated only a third of curriculum space to QM, specifically basic descriptive statistics, whereas in year two QM comprised fifty percent of the curriculum. In year two students studied secondary data analysis of a large national data-set via SPSS up to simple multivariate analysis using a control variable and the Elaboration Model. The one-hour lecture followed by an SPSS lab session was the mode of delivery for both modules. There were no QM specialists in either teaching team; indeed staff allocated to teach on the methods team self-identified as a coalition of ‘the new, crazy, and unwilling’. They consisted of new staff (‘the new’) given no choice what to teach, graduate teaching assistants in it ‘for the money’ (‘the unwilling’), and a small group of staff who actually wanted to teach QM (‘the crazy’). A focus group of QM teachers, run by the project team, indicated that they felt ‘side-lined’ and ‘unloved’ within the Department. Williams et al. (2004) and MacInnes (2010) found similar attitudes among QM teachers.

The year one module had the lowest attendance (approximately 35–40% attending weekly classes on a regular basis) and highest fail rate (30% in 2011–2012) of any year one module; the year two module had extremely low attendance and the highest fail rate (25% in 2011–2012) of any module run within the Department. The second year module had the lowest average coursework mark (55% in 2011–2012) and both modules had very poor student ratings (3.3 out of 5) in the termly student module surveys. The student survey data for both modules identified ‘poor teaching’ and ‘low levels of support’ as central issues; students described QM particularly as ‘boring’, ‘difficult’ and ‘irrelevant’. Only a handful of students did quantitative dissertations; an advanced QM third year option had not run for many years owing, in part, to a lack of specialist staff. The increasing scrutiny by the university of key indicators of student experience, such as satisfaction survey scores, progression rates, and mark ranges, led to pressure on the module teams. This pressure was evident at a programme review meeting, when it was suggested that QM be removed from the compulsory methods modules and be made optional, condemned to disappear via the discourse of ‘student choice’. Fortunately, key members of the research methods team resisted this move, but clearly the existing QM provision needed reform.

The project team conducted an anonymous web-based survey of all Department teaching staff in May 2011 to review quantitative skills. Only four of 37 staff self-identified as quantitative researchers. The remaining research active staff were overwhelmingly qualitative in focus and several were ‘anti-method’. Ironically, none of the quantitative researchers currently taught on a research methods module, although all had taught research methods (including quantitative) in the past. The survey revealed that 18 staff members had been involved in teaching QM to undergraduates during their careers. The majority of staff who had taught QM had only received introductory level training, usually while doing postgraduate study. Yet, of these 18, around half admitted to not feeling ‘confident’ in teaching QM, including SPSS. Around half the Department’s staff expressed an interest in developing their skills, primarily for teaching purposes, but a third also keen to develop their skills to use in their personal academic research. Those staff who had received staff development in QM from the university’s learning and teaching programme expressed dissatisfaction with a course designed and delivered by and for physical scientists. As one respondent stated, ‘it was all pointy clicky, numbers stuff and I was baffled’. This was the

context to the ESRC RDI bid: how do we upskill non-QM specialists to make them competent and confident teachers and through this, ultimately enhance the student's learning of QM?

Initial plan – no more pointy clicky, numbers stuff

The initial plan was to establish two staff training courses, which all staff teaching QM would have to attend. The first module ('Introduction to Secondary Data Analysis' [ISDA]) would cover all the QM content currently found in the curriculum and a second module ('Advanced Secondary Data Analysis' [ASDA]) that would follow on and enable staff to revive the mothballed third year QM option and perhaps conduct their own QM research. ISDA would run on a termly basis; it would be student-centred and aimed to 'demystify' quantitative analysis for what were overwhelmingly qualitative researchers, starting first with a focus on core numbers-work. The plan was to create a peer-support system to offer help outside of class time, alongside termly 'teaching QM' workshops to share good practice, talk, 'vent' and generally create a collective sensibility.

In January 2012, ISDA was launched and all staff teaching QM were told to attend. It was due to run as a 10-week, two-hour, lab based workshop, with a final assessment. However, attendance at the weekly lab sessions soon dwindled and those that did attend began to sound like their students, failing to see the relevance of what they were doing, struggling with the statistics ('I'm rubbish at maths'), and generally becoming frustrated with 'pointy clicky' SPSS. The peer support system struggled too, as staff disengaged from the course and later revealed (via follow-up focus groups) that they felt 'embarrassed' to reveal their struggles. At the end of the first run of ISDA, the project team reflected on the experience and staff feedback and realised that the initial approach had mirrored all the mistakes and flawed assumptions made when delivering QM to students:

- Making something compulsory does not necessarily guarantee engagement nor does it mean individuals will see its relevance. There has to be a system of incentives in place to encourage engagement.
- Technical proficiency with SPSS, or other software, does not equate to QM competence. Learning to navigate SPSS and producing outputs is low skill and can be done with little competence with statistics.
- Conceptual understanding of material does not bring with it confidence to teach. To teach confidently, teachers need pedagogic frameworks upon which to place their conceptual knowledge.
- Not all learning is linear and progressive. Individuals learn at different paces and in different ways; sometimes repetition and reinforcement occur before learning moves forward.
- We should not presume that academics have strong numeracy skills or confidence with number. Sociologists, for example, are more likely to share the same low level of maths qualifications as their students and are more likely to have studied social science or humanities A-levels, which are typically 'numbers-lite'.
- That a grasp of the 'basics' will lead inexorably on to interest in and progress with more advanced skills. Individuals need to identify the value in advancing skills that they find challenging.

Through reflection, the project team realised that the goal of the project, the acquiring of specific knowledge by the staff, had led to the needs of the 'students' (the non-QM literate staff) being subsumed by the needs of the 'tutors' (the project staff). The project staff designed the module with their needs at the heart of the curriculum and not the staff-learners, that is, with the view of 'this is what we need to cover' rather than 'how do we cover' and that was a fatal mistake. It is also a common mistake in the design of university curricula, which typically follow a linear model built on the presumption of incremental learning; the tutor designs a module where each week builds on the next and presumes that the students are building their knowledge each week in delineated blocks and can see the connections between material. However, this model is tutor driven, not student centred and the project team realised that although linearity and incremental progression were desirable, this was not realistic. The project team conflated competence with confidence, but confidence is key to effective teaching. Even those staff-learners who completed ISDA did not feel any higher levels of confidence, despite agreeing that they had improved their understanding of QM concepts and SPSS. The project team tore up the ISDA programme and a new model was developed.

Technical conceptual pedagogic practical – a soothing holistic approach

Central to the project team's endeavour was the need to create a holistic approach to upskilling that was would be sensitive to staff needs, but that had pedagogy (and the student) at its centre. Influenced by Freire's (1996) theory of conscientisation we sought to decentralise the power dynamic of the learning process by starting at the level of the needs of learners and what would critically empower them to become active consumers and producers of knowledge. The decentring of classroom power allows learners to develop a critical consciousness of not only themselves as learners, i.e. what academic baggage/preconceptions/blockages, they bring to a setting but additionally it challenges the hierarchy of the classroom, i.e. that teacher knows best. This approach is both liberating for teachers but potentially more challenging. This process of decentralisation was the product of the project team's reflection of their own practices (and presumptions) and evaluation of the staff responses to the first run of ISDA. The result was the Technical-Conceptual-Pedagogic-Practical (TCP) approach as shown in Figure 1, whereby the project team identified the four key elements that they needed to embed within the course if they were to succeed in the creation of confident, as well as competent, teachers.

Technical – How do I?

The module had to allow the staff to learn to use the SPSS software, with confidence, but not in such a way that they reverted to the 'pointy clicky' approach of instrumental button pushing, without understanding the concepts or theory behind the output tables. The staff-learners had identified SPSS as a barrier to their learning; they found the software user 'unfriendly' and much valuable lab time was taken with explaining how to work SPSS, as opposed to interpreting SPSS outputs. Additionally, staff themselves wanted a user-friendly SPSS manual for their own teaching in the lab. A student workbook was produced which covered each key SPSS skill needed, along with worked examples, review questions, and activities to do on a practice data-set. The workbook activities were incremental, they began with the easiest (opening SPSS) to

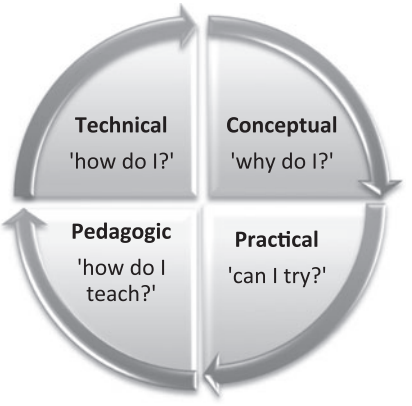

Figure 1. The TCP model.

the hardest (multivariate analysis). The staff-learners could work through the book at their own pace in the labs and return to activities with which they struggled. This was also a resource that they could road test for their own students. The idea was to (following Freire, 1996) empower the student to become an active agent in his or her own learning, using the book as a guide, going at his or her own pace. Thus removing the need for the lab tutor to waste time going over technical issues that are easily learnt and best achieved via self-directed SPSS work.

The lab tutor used the lab's media desk to go through activities together via an 'I do one, we do one, you do one' approach: the tutor demonstrates one task on SPSS, for example, how to interpret a frequency table, using the interactive whiteboard. Then the class do one together, using the interactive whiteboard and review it as a group. Finally, the students do it themselves on their own computers and the tutor monitors their progress by circulating through the lab. This approach created a sense of a collective learning space that helped the group to create a shared identity as learners. This emerging identity helped to make the classroom space 'safe' for staff to learn and crucially make mistakes. Throughout tutors reiterated that learning how to navigate SPSS was the least important of the four elements and that it was important for learners to see it as an instrumental tool for analysis, as opposed to a conceptual framework.

Conceptual – Why do I?

In conjunction with the technical aspects of learning a software package, it was crucial that the staff-learners understood how to apply concepts. The 'pointy clicky' approach often emerges due to a lack of conceptual understanding; individual students struggle with a specific concept and over-focus on generating SPSS outputs without the ability to fully analyse them. Meyer and Land's (2003, 2005) theory of 'threshold concepts' and barriers to learning, informed our approach to the conceptual part of the course. A 'threshold concept' is a concept, or theory, that students must understand in order to move forward in their learning. However, a failure to understand a 'threshold concept' blocks a student's progress and becomes a barrier to learning; Figure 2 illustrates the issue:

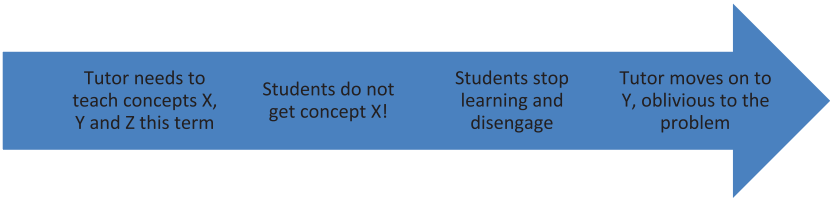

Figure 2. Barriers to learning.

'Threshold concepts' may vary by cohort or class and may emerge at any time on a module; therefore the identification of 'threshold concepts' is crucial both for the design of a course and for its delivery. Quantitative methods have been identified as having a great many challenging concepts (Williams et al., 2008), often ones that are not used commonly outside of the subject due to the marginalisation of QM (MacInnes, 2010). For example, numbers themselves were the first threshold that the majority of our students had to breach; 'maths anxiety' as a barrier to learning has been well documented (e.g. Onwuegbuzie & Wilson, 2003). We addressed this through a numeracy diagnostic at the start of the module to assess the cohort's numeracy levels. The findings from the diagnostic were used to create online numeracy support resources and allowed teaching staff to build-in extra support sessions on specific skills, for example, decimal points and percentages. Additionally, 'maths anxiety' was addressed by stressing that the numbers were 'telling stories', thus we appealed to the students' pre-existing narrative and critical skills. All this was actively facilitated by the constant message that quantitative analysis is 'not maths'. The identification of 'threshold concepts' is an ongoing process that requires teaching staff to gauge constantly student progress, thus concept testing becomes invaluable. A virtual learning environment (specifically Moodle) was used to deliver quizzes and self-tests, so that tutors could see which concepts staff-learners were struggling with and address the gaps in learning, with either extra practice or a review of the concept.

This approach means that the course must be sufficiently flexible that some sessions may be repeated or later ones removed to accommodate areas that were missed. Allowing students to learn at their own pace meant that we needed to provide additional 'pop up labs' where they could catch up with materials missed. However, it is crucial that the tutor goes at the right pace for the class throughout. The project team incorporated this flexible approach and found that the staff-learners progressed quickly through some elements of the curriculum and needed longer for others. This meant much shuffling of sessions and review of material, but the flexibility resulted in less anxiety for the learners and allowed them to feel valued; their learning needs were prioritised over time or curriculum demands.

Pedagogic – How do I teach?

Central to the new approach was to embed pedagogy within each session. The staff-learners frequently voiced the concern that 'I get this … but how the hell do I teach it?' or 'don't ask me to teach this!' Therefore each session combined SPSS tasks, and concept learning, alongside informal discussions on different ways to deliver

material, whether in lecture or in a lab setting. The tutors would lead this with examples from their own practice and then the group would evaluate, critique, and offer additional ideas. One central element of this was reflective practice; staff-learners were encouraged to reflect on their own anxieties, troubles and difficulties with QM as a means to appreciate better how their own students may feel. One example of this was their own lack of confidence with numbers and anxiety towards them; the appreciation that their own students may be feeling as they do was both liberating and empowering. This approach drew on Vygotsky's (1978) idea that learning does not happen in isolation; the classroom is not hermetically sealed off from the outside world, rather learners and learning exists outside of the classroom and learners bring baggage into it. Reflection can be a means to empower the learner and make them an active participant within their learning. As this happened among peers, it allowed the staff-learners group to form an identity as learners, with a shared experience. The project team facilitated these discussions and the group agreed a shared code of 'what is discussed in lab stays in lab'; it was deemed a confidential learning space where issues could be explored without other staff members, external to the group, finding out.

Additionally, the staff-learners were encouraged to reflect on how they and others learn; preconceptions were challenged. For example, typically students are seen as a uniform group who all learn in the same way at the same pace. However, students enter university with at least thirteen years of educational 'baggage', including, bad (and good) study habits, anxieties, and specific learning styles (often laid down early in childhood). The staff-learners were encouraged to reflect on their own learning styles (and 'baggage') as a means to explore their students' perspectives. The importance of a diversity in modes of delivery of material in order to address different learning styles was explored as was the importance of not viewing all learning as linear. Teachers and curricula need to be flexible. This exploration of learning styles led to innovation in practice, including, how to incorporate kinaesthetic and visual learning into lectures. This dialogic element also challenged the staff's earlier identification of the lab sessions as boring, lacking interactivity and being 'sterile' in contrast to their regular teaching spaces, which were designed for dialogue.

Various pedagogic techniques were introduced to the sessions to facilitate learning, but also to demonstrate how the staff-learners might support and deliver material to their students. Various scaffolding techniques (Wood, Bruner, & Ross, 1976; Wood & Wood, 1996) were utilised, such as concept testing, and one popular one was the 'pink cards'; these were (pink) task cards that listed a set number of formative tasks that the tutors could use to map and assess progress and learning. The tasks were completed at the staff-learners' pace enabling them to be agents of their own learning. The 'pink cards' also allowed the tutor to monitor progress amongst the lab group. This technique proved popular with the staff-learners and subsequently with their students. Staff were encouraged to use classroom technology to facilitate interactivity, including Kahoot[4] quizzes, Socrative discussions, and interactive online data. Staff shared information on resources that they found outside of class.

Practical – Can I have a go?

The final element of this model was a 'learn by doing' approach; the weekly lab tasks, quizzes etc. allowed the staff-learners to 'have a go' at the material. The

practical element gave the staff practice time to concretise their learning and to make mistakes; often the most useful insights came from errors. Particularly useful was the assessment exercise, whereby all the staff had to do the assessment that they expected their students to do. This allowed staff to appreciate better their assessment task and mark scheme, leading to much revision of the assessment to make it more user-friendly. This activity made staff much more reflective of how they marked the assessment.

This new model was adopted to coincide with the revamp of the QM curriculum and staff attending the subsequent ISDA modules liked the linkage between actual course content ('this is what I will teach') and the training course. Subsequent sessions (Jan 2013, Sept 2013, and Sept 2014) were better attended and the staff-learners were happier and more comfortable. Staff-learners were encouraged to re-attend sessions on material that they found difficult and this flexible approach was useful as staff-learners used repeat sessions to 'fine tune' on certain topics. This approach led to a greater sense of shared identity and cohesion among the QM team, which greatly facilitated the process of curriculum revision and innovation.

Going further?

The original plan has been to launch an advanced QM training course for staff that would follow on from ISDA. However, it became clear that the timeframe for this was over-ambitious, as it took the staff-learners longer to feel confident with the basics, many retaking specific sessions. A small group of staff-learners were encouraged to attend external advanced training courses, but were disaffected with these due to their lack of consideration for pedagogy either in their delivery or content. By summer 2014, an advanced module was delivered in-house to the original ISDA cohort and this will be repeated in summer 2015.

Valuing QM/valuing staff

Upskilling staff does not just mean putting them on a training course, nor does it mean giving them bespoke materials to teach. Rather it demands the creation of a culture that values both QM and the staff delivering it (MacInnes, 2010; Williams et al., 2004). The project team's realisation that staff would not engage with the training just because 'they have to' was important. Ely and Ely (1995, p. 25) highlights that lecturers 'need to know that time and energy invested in acquiring new skills will be recognised and rewarded by their employer'. The project team then had to confront the question of what would incentivise the staff.

Qualifications?

In the UK, it is not a statutory requirement that university teachers have a teaching qualification or engage in continuous professional development, although the reports by Dearing (1997) and Browne (2010) recommended both. The foundation of the Higher Education Academy in 2003 and the more recent UK Professional Standards Framework in 2011, have aided the professionalisation (and its accreditation) of university teaching. Nevertheless, the onus remains on the individual university to prioritise training. Yet Guskey (2000) has emphasised the fact that improvements within education rarely occur without a process of professional development. The

project team were committed to getting the two staff QM training courses accredited by the university, so staff could use the course to gain credits towards a PGCAcPrac or MA in Academic Practice. Two problems quickly emerged; the first was the difficult and slow internal accreditation process and the second was the fact that most of the staff had a PGCAcPrac already and had no interest in gaining further credits or qualifications. The pursuit of accreditation was abandoned early on. However, by the final year (2014) of the project the university had streamlined its approach to staff training via a new flexible CPD system whereby diverse forms of training could be rewarded via a points system. Therefore, ISDA and ASDA are now accredited within the university's CPD framework. Additionally, the university is currently rolling-out CPD as a means to prioritise and normalise staff training.

Workload recognition?

The biggest driver of staff engagement was the decision to allocate additional workload recognition to those staff doing the training and teaching on the QM modules. The Department's workload model allowed the project team to do this and fortunately, the Head of Department was willing to divert extra resources. The pre-project complaint of 'not having enough time' to either teach QM or train in QM was addressed. The workload support was important because it showed that the Department valued the QM staff; a group who had once felt marginalised. This workload approach also resulted in other staff wanting to take the training and shift into methods teaching, thus increasing the QM pool of talent.

Valuing QM

It was important for the Departmental culture to value QM. Therefore, the project team worked with the Head of Department to change the Departmental culture. The Departmental strategic plan (2013) identified QM as one of its priorities, both for teaching and research. Teaching technology in labs and lecture theatres was funded to facilitate interactivity. In addition, pressure was exerted on the wider faculty administration to refit all the teaching labs, equipping them with new computers and interactive media desks. As well as staff receiving additional workload, all QM classes were given additional contact teaching hours; three hours per module, per week, in contrast to the two hours per week of a non-QM module. This change in Departmental culture not only valued QM staff, but also signalled to other staff the value of QM and its place within the Department. One outcome of this shift and of the training course has been the embedding of statistical and data literacy within non-methods modules, which started in 2013–2014. As other staff see the value of QM (and its potential value to them too) it has been easier for the QM staff to run an embedding programme. Those staff that participate in embedding also receive workload relief to train in QM and to teach embedded material. This in turn strengthens the Department's QM culture through the normalisation of QM within the wider curriculum and staff.

Without the wider Departmental recognition it would have been difficult for the project to have made the impact that it had; workload was an essential driver, as staff are busy and have many demands on their time. A less sympathetic Head of Department, or the absence of a clear workload model, would have made the training course and teaching QM less attractive. In the Department, as is common in

most Sociology departments, the QM staff are the minority; therefore, the worldview of the majority of staff is often to view QM as marginal to the curriculum. The allocation of new or junior staff to the QM teaching teams can reinforce this view. If the departmental culture changes to value QM, via resourcing, infrastructural change, strategic prioritisation etc. then all staff can see the potential worth in QM. Such a departmental shift in staff worldviews has an important impact on students' attitudes to QM too. Staff are crucial in shaping students' attitudes to QM (Williams et al., 2008); one barrier to learning QM is student attitudes, even if QM teachers are fantastic they may fail to shift student perceptions if all their other tutors and modules are non-QM or even anti-QM. Thus is it important that departmental culture identifies QM as an essential element and that normalises QM via embedding (and training).

Impact – confident staff/confident students

As the project nears its end, the impacts have been overwhelmingly positive for staff and students.

Staff

All staff who now teach QM have been on the basic training course, including graduate teaching assistants. A small number have done the advanced training and more will take this later in this academic year (2014–2015). The QM staff are now a strong team who have expanded, following new appointments that prioritised QM, and who regularly share good practice. One outcome of the training course is a shift towards team teaching, with staff co-delivering lectures and even labs. This provides for a more dynamic delivery but also affords informal peer review and support, which further informs practice. Student free text comments in termly module satisfaction surveys have noted, 'The way the team work together to cover each other, they are very passionate'; 'Lectures this year have become much more active and interesting'; 'The enthusiasm of the tutors and lecturers. It's a really dry subject, made much better by the quality of the staff'. An interesting outcome of our approach was that in the past getting tutors to work on the QM modules was challenging while now we are in a position where we have more colleagues wanting to teach than we have available classes. The strong group identity and culture of shared practice has led to the QM staff taking a lead in Departmental learning and teaching initiatives, including demonstrating how to use technology to enhance interactivity, the role of concept testing, and the importance of addressing the student as an individual learner. Staff have shifted from self-identifying as 'not a quants person' to 'I'm on the quants team'.

Students

The two large compulsory methods modules in years one and two have been revised in the light of this training course. The specific curriculum is similar; indeed the QM is now at a slightly higher level and there is more of it (50% of the curriculum) in the first year. However, the style of delivery in both lab and lecture is radically different, drawing on the pedagogic theories that underpin the training course; what worked for the teachers now works for the students. Concept testing, diagnostic

maths testing, practical examples, formative assessment via the 'pink task cards', an SPSS workbook, interactive technology, and a range of delivery styles (including visual and kinaesthetic) place the onus on the student as an active participant in his or her own learning (following Meyer & Land, 2003; Vygotsky, 1978). The students are more competent and confident; the second year QM module has one of the highest pass rates (95% in 2013–2014), average coursework marks (65% in 2013–2014), and student satisfaction scores (4.3 out of a possible five, in 2013–2014) in the Department. The first year module is not far behind in terms of results, student progression and satisfaction. Final year students even asked for a third year QM option at the end of the last academic year (2013–2014) and 38% (32 out of 85) are doing QM dissertations in the current academic year (2014–2015) compared with only 2% (2 out of 121) doing QM dissertations in 2013–2014. The number taking dissertations is partly due to the creation of placement based QM dissertations, but if the Department had not upskilled their staff then the placement programme would not have worked as there would have been insufficient staff to support it.

Final comments

Since this project started in late 2011, the position of QM and its value within the Department has changed radically. This project enabled the Department to upskill staff, but additionally to revamp curricula, placing the student and pedagogy at its heart. Within the context of the Department of Sociology at MMU, the upskilling of staff is continuing, and is valued and rewarded in a range of ways. Some of those upskilled staff are now using QM within their research and staff who do not teach on the methods modules now want to take the training, as they want to embed QM and are interested in conducting QM research. The project team are now making the QM training available to staff outside the Department both within the university and for external organisations.

Lessons from the experience described in this paper include that universities need to take the training of staff more seriously. Often a 'deficit' model is applied whereby staff attend courses because they are deemed to 'lack' skills rather than because they may wish to develop skills and new competencies. Thus, training is identified with a 'problem' as opposed to an enhancement. Ironically, university teachers perceive themselves as able to teach through their acquisition of specialist research knowledge, with scant reflection on the art or practice of teaching. Until universities reward good teaching as they reward good research, this will not change. On a more positive note, the rise of the student as consumer and the switch towards an emphasis on the student experience and satisfaction is leading to an increased focus on teaching quality and practice. Continuing professional development should be a key component of all university teachers and be rewarded within university pay and progression schemes. One positive outcome of the QM 'problem' in the UK has been the emergence of a strong QM teachers' community who share practice and opinion. The ESRC's CI and RDI projects are producing a range of outputs and resources, which are now coming on stream to support QM teachers. Additionally, the issue of statistical literacy and the strategic importance of QM has resulted in a myriad of resources to support teachers and value QM for teachers and students alike, for example the QM Initiative (Economic & Social Research Council [ESRC], 2013). The creation of the Q-Step Centres will add to this growing body of teaching resources and models. The challenge lies in ensuring that QM teachers

outside of this network are supported via resources and networking opportunities. One final positive reflection would be that those who teach QM have much to teach those staff who are faced with the problems of other 'difficult to teach' subjects, such as social theory. Many of the pedagogic strategies that we have found effective in delivering QM could (and should) be used as exemplars of good practice for all challenging subject areas.

Disclosure statement

No potential conflict of interest were reported by the authors.

Funding

This work was supported by the Economic and Social Research Council [grant number ES/J011703/1].

Notes

1. 80% of British students studying for a degree in Sociology studied the subject at A2 level (British Sociological Association [BSA], 2013b).
2. See a discussion of some of the key factors affecting secondary school teachers' ability to deliver QM within A level curricula in Scott Jones and Goldring (2014).
3. ESRC 'No More Point Clicky, numbers stuff; building staff quantitative skills', ES/J011703/1.
4. Kahoot and Socrative are classroom response systems that utilise game-based blended learning including polls, quizzes, debates and so forth. Both systems allow learners to interact within the classroom via the use of mobile devices. Such technologies are particularly effective in engaging all learners and allowing tutors to receive instant feedback to class material.

Notes on contributors

Julie Scott Jones is the Director of the Q-Step Centre and Associate Head of the Department of Sociology at Manchester Metropolitan University, UK. She is the Principal Investigator on the ESRC RDI project, '*No More Point Clicky, numbers stuff; building staff quantitative skills*' (2011–2014).

John E. Goldring is the Deputy Director of the Q-Step Centre and a Senior Lecturer in the Department of Sociology at Manchester Metropolitan University, UK. He is the co-investigator of the ESRC RDI project, '*No More Point Clicky, numbers stuff; building staff quantitative skills*' (2011–2014).

References

Blane, D. (2003). The use of quantitative medical sociology. *Sociology of Health and Illness, 25*, 115–130.

British Academy. (2012). *Society counts*. London: Author.

British Sociological Association. (2013a). *Mapping sociology project report*. Durham: Author.

British Sociological Association. (2013b). *Discovering sociology*. Durham: British Sociological Association.

Browne, J. (2010). *Securing a sustainable future for higher education*. Report of the independent review of higher education funding and student finance. London: Department for Business, Innovation and Skills.

Dearing, R. (1997). *Higher education in the learning society*. Report of the national committee of enquiry into higher education. London: HMSO.
Economic and Social Research Council (2013). *ESRC/HEA QM initiative website* [online]. Retrieved October 8, 2013, from http://www.quantitativemethods.ac.uk/
Economic and Social Research Council, Heads and Professors of Sociology, British Sociological Association. (2010) *International benchmarking review of sociology* [online]. Retrieved October 10, 2012, from http://www.esrc.ac.uk/_images/Int_benchmarking_sociology_tcm8-4556.pdf
Ely, P., & Ely, A. (1995). IT training and staff development in universities. *Education and Training, 37*, 18–30.
Freire, P. (1996). *Pedagogy of the oppressed*. London: Penguin.
Gibbs, G. R. (2010). Mathematics and statistics in the social sciences. In C. M. Marr & M. J. Grove (Eds.), *Responding to the Mathematics problem: The implementation of institutional support mechanisms* (pp. 44–50). St Andrews: The Maths, Stats and OR Network.
Guskey, T. R. (2000). *Evaluating professional development*. London: Sage.
Higher Education Funding Council for England. (2005). *Strategically important and vulnerable subjects; final report of the advisory group* [online]. London: Author. Retrieved December 21, 2012, from http://www.hefce.ac.uk/pubs/hefce/2005/05_24/05_24.pdf
Lynch, R., Maio, G., Moore, G., Moore, L., Orford, S., Robinson, A., … Whitfield, K. (2007). *ESRC/HEFCW scoping study into quantitative methods capacity building in Wales*. Final report to the ESRC and HEFCW [online]. Swindon: ESRC. Retrieved February 25, 2014, from http://www.esrc.ac.uk/_images/Scoping_Study_into_Quantitative_Capacity_Building_in_Wales_tcm8-2724.pdf
MacInnes, J. (2010). *Proposals to support and improve the teaching of quantitative research methods at undergraduate level in the UK* [online]. Swindon: ESRC. Retrieved December 21, 2012, from http://www.esrc.ac.uk/_images/Undergraduate_quantitative_research_methods_tcm8-2722.pdf
McVie, S., Coxon, A., Hawkins, P., Palmer, J., & Rice, R. (2008). *ESRC/SFC scoping study into quantitative methods capacity building in Scotland*. Final Report [online]. Retrieved November 9, 2012, from http://www.esrc.ac.uk/_images/Scoping_Study_into_Quantitative_Capacity_Building_in_Scotland_tcm8-2683.pdf
Meyer, J. H. F., & Land, R. (2003). Threshold concepts and troublesome knowledge: Linkages to ways of thinking and practising within the disciplines. In C. Rust (Ed.), *Improving student learning: Improving student learning theory and practice-ten years on* (pp. 412–424). Oxford: Oxford Centre for Staff and Learning Development.
Meyer, J. H. F., & Land, R. (2005). Threshold concepts and troublesome knowledge (2): Epistemological considerations and a conceptual framework for teaching and learning. *Higher Education, 49*, 373–388.
Mills, D., Jepson, A., Coxon, T., Easterby-Smith, M. P. V., Hawkins, P., & Spencer, J. (2006). *Demographic review of the UK social sciences* [online]. Swindon: ESRC. Retrieved February 25, 2014, from http://www.esrc.ac.uk/_images/demographic_review_tcm8-13533.pdf
Nuffield Foundation. (2013). *Q-step programme website* [online]. Retrieved November 10, 2013, from http://www.nuffieldfoundation.org/q-step
Onwuegbuzie, A. J., & Wilson, V. A. (2003). Statistics anxiety: Nature, etiology, antecedents, effects, and treatments – A comprehensive review of the literature. *Teaching in Higher Education, 8*, 195–209.
Parker, J., Dobson, A., Scott, S., Wyman, M., & Landén, A. S. (2008). *International benchmarking review of best practice in the provision of undergraduate teaching in quantitative methods in the social sciences* [online]. Retrieved October 10, 2012, from http://www.esrc.ac.uk/_images/International_benchmarking_undergraduate_quantitative_methods_tcm8-2725.pdf
Payne, G., Williams, M., & Chamberlain, S. (2004). Methodological pluralism in British sociology. *Sociology, 38*, 153–163.
Rendall, M. (2003). *Quantitative research: A scoping study for the learning and skills research centre* [online]. Retrieved December 21, 2012, from http://www.tlrp.org/rcbn/capacity/Activities/Themes/Secondary/lsda_quant_research.pdf

Scott Jones, J., & Goldring, J. E. (2014). *Skills in mathematics and statistics in sociology and tackling transition. Higher education academy STEM project: Skills in mathematics and statistics in the disciplines and tackling transition*. York: HEA.

Vorderman, C., Budd, C., Dunne, R., Hart, M. & Porkess, R. (2011). *A world class mathematics education for all our young people* [online]. Retrieved November 11, 2012, from http://www.tsm-resources.com/pdf/VordermanMathsReport.pdf

Vygotsky, L. S. (1978). *Mind in society: Development of higher psychological processes*. Boston, MA: Harvard University Press.

Williams, M., Collett, C., & Rice, R. (2004). *Baseline study of quantitative methods in British sociology*. Birmingham/Durham: C-SAP/BSA.

Williams, M., Payne, G., Hodgkinson, L., & Poade, D. (2008). Does British sociology count? Sociology students' attitudes toward quantitative methods. *Sociology, 42*, 1003–1021.

Wood, D. J., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry, 17*, 89–100.

Wood, D., & Wood, H. (1996). Vygotsky, tutoring and learning. *Oxford Review of Education, 22*, 5–16.