

Getting students engaged with quantitative methods: Inquiry-based learning and group assessment



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I have heard 'I'm just not a methods person' from undergraduates many times. Both students and staff often divide themselves into 'methods people' or 'theory people' (David, 2011), imposing a separation between the two. This can make methods seem less essential to the discipline, even though the connections between theory, methods, and methodology are integral to sociology (Parker, 2011) (and to social sciences more broadly). Therefore, as a first-year methods teacher, one task is to guide students in seeing the value and role of methods in sociology and in developing theory. Moreover, in the class I convene, I need to demonstrate the importance of both qualitative and quantitative approaches and teach how research methods work in practice and how to critically consider the ways data is gathered about social life.

The biggest challenge in this is getting sociology students to be curious about quantitative methods. Overall, there has been a noticeable deficiency of quantitative teaching and learning in UK sociology, impacting students' understanding of the value and function of statistics in its research (Williams *et al.*, 2016). Students are often reluctant to learn these research skills, a trend seen in the social sciences generally (Adeney and Carey, 2011). The stress that comes over students' faces every semester, when it sinks in that the time has come for maths and statistical analysis, is familiar. Throughout the module, students frequently express that they are not a maths person, think numbers are confusing, or that statistics are stressful. Anxiety, especially, seems to creep in with the stress of being assessed on such skills. Dharmi Kapadia (2018), a colleague and one of the educators who previously convened my first-year methods module, wrote about strategies for engaging students. She emphasises that working with quantitative data enhances their data analysis skills and confidence in using it outside the classroom. She goes on to say that this is an increasingly important quality for students to have as our future 'thinkers, scholars, researchers, and data analysts' in a world becoming more and more inundated with large quantities of information. They should learn how to responsibly

interpret different forms of data and understand how it is used in research. In agreement with this, it is not surprising that staff, not just students, become anxious about teaching/learning quantitative methods, especially if it is not their speciality and they want to teach statistics 'right', ensuring it is rigorous while also having the learning be 'fun' and 'painless' (Lewis-Beck, 2001: 8-9; Adeney and Carey, 2011). To address this, my module employs an inquiry-based learning approach, where, with the support of teachers, students design and lead research projects as their final assessment. This approach enables students to conduct research, helping them become excited about methods (Parker, 2011; Archer-Kuhn, 2023). By using secondary survey datasets, students explore a research topic to produce a research report, presenting their findings as their final assessment.

In this piece, I focus on how I developed the quantitative assessment by transitioning from an individual research report to a group project, with the aim of facilitating 'lightbulb moments' for students learning research methods. Although students may be apprehensive about group work, it has several benefits, including the division of workload and encouragement of cooperation (Adeney and Carey, 2011). However, for this assessment, I made this choice primarily to create a supportive learning experience so that it was less overwhelming to learn about quantitative methods than working alone – what Williams (*et al.*, 2016) calls 'a safety in numbers' comfort factor. Collaboratively learning and working towards a common goal can reduce anxiety, providing an opportunity to enhance critical thinking skills and deepen knowledge of the discipline (McKay and Sridharan, 2024).

The assessment aims to enhance both peer and teacher support for students engaging with new and complex material, while also providing more flexibility and creativity in working with quantitative data. To help with students' confidence in learning complex material, the assessment is scaffolded through smaller tasks such as group progress meetings with the course convenor, peer and self-review and a final poster presentation at a class end-of-year conference (Parker, 2011; Archer-Kuhn, 2023). Guidance and a structure for the assessment are provided. For example, students choose from pre-approved datasets to conduct their research, and they are offered readings to guide their projects. Additional support is provided throughout the module, having students conduct statistical analysis in weekly tutorials and they are taught study skill sessions that are embedded into lectures, such as how to design a

research poster. Lastly, they are provided with marking criteria on teamwork and research integrity to gauge the quality of work and the goals they want to meet for this assessment.

As Kapadia (2018) says, for students who think they're 'rubbish at maths', completing this assessment is an achievement. Together, the groups create research questions and hypotheses, explore empirical literature and theory, choose the appropriate data set, process and analyse the data, and design a poster. By the end of the year, students have conducted bivariate analysis on large datasets, which includes generating frequency tables, two-way crosstabulations and chi-square tests. They experience working as a group, what it takes to organise a research project and how they can disseminate their research.

Over the past three years of doing this assessment, I have found that many students shift from being fearful and anxious to feeling more confident and critical about quantitative methods and group work. I have spoken with several students about how they are surprised at how easy they found quantitative data analysis. During group progress meetings groups share that through peer support they have more easily comprehended relevant concepts and analytical techniques than they would have been able to do individually. In these instances, their anxieties about complex material were put to ease through collaborative problem-solving. I, too, have been surprised, mainly around the critical and nuanced questions students bring about their projects, something that was rare when students were completing the individual assessment. They ask about their role in how the data is being interpreted and some are interested in more advanced statistics. Overall, I am finding that this approach to assessment has enabled students to get curious about research methods and areas they would like to explore, while pointing out the value that quantitative analysis has for sociology.

However, this assessment is not foolproof and inquiry-based learning, as well as group assessment, can present challenges. For example, some students seek more structure and guidance to reflect the kind of learning approaches they are more used to (Archer-Kuhn and MacKinnon, 2023). There are also challenges with implementing group work, such as the difficulty in organising students, fairness in assessment, free riders, as well as trying to ensure positive student experiences of collaborative work for a range of diverse learners (El Massah, 2018; Forsell, Forslund Frykedal and Chiriack, 2021; McKay and Sridharan, 2024). I have used a scaffolding learning approach to address common pitfalls of group work. For example, to mitigate the risk of free riders and issues of fairness, the progress meeting and group

presentation are in-person assessments with all students required to participate equally to explain the part they have done in the project. Each student also submits a peer and self-review, in which peers mark one another and their self on teamwork performance, contributing to 15% of each student's mark. Of course, there are challenges, and through this experience, I have found a personal teaching a-ha moment in how to navigate anxious students attempting to avoid doing statistical analysis. There are structural ways this is accomplished, for instance, students are required to complete analytical workbooks in mandatory tutorials for our class. But I have found that putting the onus on our sociology students that their education is their responsibility has also been effective. In my teaching, I instil that their learning and engagement in our module is a prerequisite for the year two mandatory Survey Methods module. Moreover, I explain that the programme is designed so that each year students have methods courses that build on each other and that this knowledge is crucial in doing well in their third-year dissertation. This seems to resonate with (at least some) students, grounding their understanding of why they need to learn methods in the first place. Indeed, this conversation is an attempt to address the issue of students' viewing methods as less essential than theory within sociology, as outlined earlier.

Overall, this change in assessment has helped generate a shift in students from being anxious to becoming more comfortable with using quantitative methods and seeing it as more approachable in my class. Looking ahead, the module will be further developed using a team-teaching approach to integrate both qualitative and quantitative expertise into our teaching to best support our students. Indeed, undergraduate research methods and statistics classes in the social sciences can be taught by non-experts in the discipline. However, making this class team taught is enabling us to use our expertise to think about the wider picture of how students are learning about quantitative (and qualitative) methods over the whole programme, so that our module is a starting point for the rest of the journey at university (Adeney and Carey, 2011; Parker, 2011).

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