

# NCRM Bitesize Lessons for Teaching Social Science Research Methods



## 5: Teaching Quantitative Social Science Research Methods Online

### What are quantitative social science research methods?

Quantitative social science research methods involve the measurement of social phenomena to produce statistical descriptions of populations of interest. Quantitative methods of data collection include surveys, polls and systematic observations. Data generated from these methods or from existing data are analysed using statistical, mathematical and computational techniques.<sup>1</sup>

### Teaching quantitative research methods online

Online teaching refers to the use by teachers and their students of online, digital technologies to teach and learn quantitative social science research methods courses. The term includes online-only delivery, the use of online resources to supplement place-based, in-person teaching (blended delivery)<sup>2</sup>, and the combination of online and place-based, in person teaching (hybrid delivery)<sup>3</sup>. Online teaching and learning can involve students and teachers being in the same temporal (synchronous) space or occupying different temporal spaces (asynchronous online teaching).

### Challenges of teaching quantitative methods online

The teaching and learning of quantitative social science research methods is challenging due to the complexity of the subject, its technical language and the abstract ideas on which methodological decisions are made<sup>4</sup>; the diversity in students' disciplinary backgrounds; and students' statistics anxiety<sup>5</sup>. These challenges are

exacerbated online, particularly in online, asynchronous environments.

Online quantitative methods teachers face additional challenges. These include how to structure and sequence content in ways that manage students' cognitive load within asynchronous learning environments; how to motivate students to engage with the content and learning; and how to assess students' learning progress and provide feedback that supports their learning.

Teaching quantitative social research methods 'with and through data'<sup>6</sup> is valued by teachers and students in place-based settings as it supports the development of students' understanding of the relationship between theory and practice, but online it presents additional challenges. Online teachers consider how best to manage the risks associated with students collecting their own data within the context of an online course. How to manage the size of data sets so that they do not overwhelm students and how to distribute them. When teaching students how to undertake analysis, online quantitative methods teachers must consider whether students will need to download analysis software and datasets onto their own devices and how they will be supported in doing this.

Place-based quantitative methods teachers may provide practical lab sessions where they can look over the shoulders of their students as they undertake practical exercise, spotting syntax errors and dealing with issues as they arise. The online teaching environment can present challenges in terms of how teachers can quickly spot students' errors and provide support, particularly in asynchronous environments. The appropriateness of datasets for the envisioned students also needs particular attention when teaching online, for example to ensure that the concepts being measured are clearly defined and culturally accessible to students.

## Insights from the pedagogical literature

Reviews of the literature on the teaching and learning of quantitative social research methods in place-based settings have highlighted the active and problem-based learning approaches that teachers value and the central role that teaching with and through data plays within it. This can involve engaging students in data collection and analysis activities.

The literature on the teaching and learning of quantitative methods online is limited and made up almost entirely of 'close-to-practice'<sup>7</sup> teacher reflection. Within this small corpus, active learning approaches and strategies were in evidence. Online, teaching with and through data involved students in the review, critique, and reflection on quantitative measurement approaches and reporting individually and in small groups. Examples of online quantitative methods students being asked to collect their own data<sup>8</sup> or undertake analysis<sup>9</sup> were rare.

The quantitative social research methods online literature also includes an exemplar of pedagogic innovation, involving combining principles from socio-constructivism, Learning as Knowledge Creation<sup>10</sup> and Pedagogy of Desire<sup>11</sup> to design activities that address statistics anxiety among students<sup>12</sup>. These activities include students in creating memes based on popular TV characters that illustrate statistical concepts and the use of Second Life (<https://secondlife.com/>) – a virtual world platform – to teach factor analysis and discriminant function analysis.

## Strategies for teaching quantitative methods online

Online quantitative methods teachers use a range of generic strategies that support students learning online. They make content accessible to students through simplifying technical language and check students' understanding via summative and formative assessment. They manage cognitive load through the sequencing and structuring of course content and the scaffolding of tasks, providing step-by-step instructions. They motivate students by showing the relevance of data to their contexts and providing them with feedback on their learning, and providing opportunities for students to practice in a sandpit environment. These strategies take on particular importance in the online

teaching and learning space, when teacher and students are physically and potentially temporally separated.

In addition, online teachers can adopt active learning strategies that support students in applying theory in practice. These can include providing students with teaching data sets, planning for students to install analytical software on their own devices and providing step by step instructions and access to technical support, summarising data using different statistical techniques, building analytical tools using software functions to answer questions, and developing and implementing an analysis plan to answer specified questions. Strategies adopted to address the physical (and temporal) separation of teachers from students include modelling thought processes, walking students through quantitative data analysis, highlighting the importance and sequencing of analytical steps, thinking aloud/ narrating an analytical process, and in synchronous online teaching, screen-sharing.

Other active learning strategies involve planning activities that involve students collecting their own data, for example designing questionnaires, providing students with access to web survey software and supporting them in carrying out a web survey on a specified topic with family and friends. Strategies can also involve planning tasks that involve students discovering how research design decisions shape the data collected, for example by getting students to find out what data are available on a topic of interest and how concepts are operationalised.

Online quantitative methods teachers may also combine active learning with problem-based learning and student-centred strategies. The latter involves teachers getting to know their students so that they can connect concepts and data with individual learners' contexts and interests, removing barriers to learning, and offering students choices in the data activities they undertake.

Online educational support staff can support online teachers with course creation, with their knowledge of the functionality and affordances of Learning Management Systems and Virtual Learning Environments, video conferencing software and other digital tools that can support teaching and learning.

## Useful links

NCRM Bitesize Lessons for Teaching Social Research Methods. 1. Active Learning.

[https://eprints.ncrm.ac.uk/id/eprint/4934/1/NCRM%20Bitesize\\_Active%20Learning.pdf](https://eprints.ncrm.ac.uk/id/eprint/4934/1/NCRM%20Bitesize_Active%20Learning.pdf)

UK Data Service Recommended Resources for Teaching with Quantitative Data

<https://ukdataservice.ac.uk/learning-hub/teach-with-real-data/teaching-resources-quantitative-data/recommended-resources-teaching/>

Pew Methods 101 series of short videos explaining different quantitative methods, focused primarily of surveys. <https://www.youtube.com/playlist?list=PLZ9z-Af5lSavJpPlvdMU4T-etlDOUmldk>

SAGE Research Methods Teaching contains teaching materials for lectures teaching quantitative methods courses at undergraduate and postgraduate level. <https://teaching-methods.sagepub.com/>

## References

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