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Executive Summary: Teaching undergraduates with quantitative data in the Social Sciences at UCSB

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<https://escholarship.org/uc/item/9mn5c9vh>

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Publication Date

2021-12-01

Data Availability

The data associated with this publication are available at:
<https://doi.org/10.25349/D9402>

Teaching undergraduates with quantitative data in the Social Sciences at UCSB

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Research Goals

- 🎯 Explore pedagogical techniques and support needs in teaching undergraduates with data.
- 🎯 Provide actionable recommendations for stakeholders within and outside the library to inform new services, policies, and practices to advance data instruction in the Social Sciences.

Background

Teaching data skills in the Social Sciences is an evolving praxis in today's data-driven world. Students in higher education who study in the discipline are tasked with using quantitative and computational methods while gaining facility with tools and techniques that aid them in data analysis. Meanwhile, instructors readily adapt curricula, teaching practices, and research techniques to develop the necessary skills to facilitate student learning with data. Designed by Ithaka S+R, this study explores how libraries can better support students and teachers in the Social Sciences as they entertain quantitative and computational approaches to deal with pressing contemporary social issues and dynamics both locally and globally.

Methods

Social Sciences is broadly represented at UCSB by 12 distinct departments. A total of 22 instructors of record who teach quantitative research skills in undergraduate courses within the Social Sciences were recruited via course catalog screening and peer recommendations. Ten faculty participated in the study representing six different departments: Anthropology (3), Communication (2), Sociology (2), Economics (1), Global Studies (1), and Psychology (1). Interviews were conducted over Zoom and included questions related to the course of interest, ways students access and work with data, and existing and desired training and support. Interviews were transcribed and coded in MAXQDA.

Read the full report :

<https://doi.org/10.25436/E2101H>

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Findings

Critical Thinking & Data Literacy

The core learning goal for instructors was to develop students' critical thinking skills with data, including:

1. A conceptual understanding of the research methods employed by Social Scientists,
2. The ability to critically evaluate research methodologies, findings, and data sets, and
3. Develop prowess using quantitative and computational tools and technologies to aid them in this process.

Challenges Teaching with Data

While the core learning goal was to foster critical thinking skills, instructors noted a fundamental shift in the way students encounter data day-to-day. Data is present in almost every transaction or task students command, making data both highly visible and invisible. Instructors are challenged to make data visible, constructing meaning from data in a manner that is accessible to students, and establishing a means for students to question data intelligently with the practices of the discipline. In this process, instructors also encounter students' fear of math and limited digital dexterity to use affiliated software with confidence.

Findings cont.

Community of Practice

Almost everyone interviewed in this study contributes to a community of practice in their discipline. Teachers are open to sharing their course materials with other teachers and seek to adopt them when applicable and appropriate to their teaching goals. As they engage in these communities, they also depend upon one another to facilitate their own learning and serve as partners in research when needed. Time is a significant barrier to these individuals building their professional development toolbox. Their duties as teachers, researchers, and administrators often interfere with more involved learning experiences, such as Carpentry Workshops.

Institutional Support Needs

In some instances, there is only one individual in a program or department who teaches a course that involves quantitative or computational research methods in the Social Sciences. Yet, there is growing interest at the university to support teaching these research techniques. Instructors lack a central means to connect to the professional development opportunities and resources on campus to develop their own skills. Those who have teaching assistants have found that they serve as crucial resources for facilitating class sections and helping the instructor-of-record learn the latest techniques and tools available in the field. Instructors also often rely on labs for students to have access to select technologies. Yet, these labs can often be challenging to schedule, and better and regular maintenance is needed.

Recommendations

Expand curricula & opportunities for immersive and experiential learning

The Library, in partnership with departmental stakeholders and other relevant campus units such as the Center for Innovative Teaching, Research, and Learning (CITRAL), may discuss the scope of course offerings and sequenced course curricula as a means to expand opportunities for students to apply acquired data skills to real-world scenarios through internships, research projects, and capstone projects.

Develop partnerships and strategies for assessing instructional needs and priorities

The Library values partnering with departmental representatives and other groups such as the Quantitative Methods for the Social Sciences (QMSS) committee to continue to evaluate campus resources, including available tools, labs, and pedagogical demands from faculty and students. Partnerships like this could lead to new opportunities to prepare the next generation of TAs who support data instruction. Joint and continuous programs to assess students' entry knowledge may aid in the development of transitional educational programs to reduce students' self-limiting beliefs while advancing data literacy training.

Help instructors adopt more robust and open statistical tools

Most faculty acknowledge the desire to learn and incorporate more robust and open statistical tools (e.g., R) into their instruction; however, they have not been able yet to transfer their extensive statistical knowledge to these more advanced tools, which require programming skills. Carpentry workshops are known for introducing basic functionalities and helping learners to get acquainted with programming. Faculty-only workshops could be offered as a train-the-trainer strategy to help them feel more comfortable participating. The first series of carpentry-style workshops could get them more familiar with the tools. Subsequent workshops developed in partnership with the Data Science Consulting Laboratory (Datalab) in the Department of Statistics and Applied Probability (PSTAT) could help instructors confidently perform the same tests and statistical analysis using more advanced tools.