ARTICLE

Online Student Engagement in Social Science Research Laboratories: Expert Advice on the Opportunities and Challenges

Alissa Ruth, Cindi SturtzSreetharan, Melissa Beresford, Alexandra Brewis, Shauna B. BurnSilver, Christopher R. Caseldine, Caitlin Drummond Otten, Emir Estrada, Daniel J. Hruschka, Elisabeth Ilboudo Nébié, Megan Jehn, Kelly J. Knudson, Matthew V. Kroot, Jonathan N. Maupin, Kostalena Michelaki, Christopher Morehart, Robin G. Nelson, Matthew A. Peeples, Kathryn L. Ranhorn, Michael E. Smith, Christopher M. Stojanowski, Amber Wutich, Abigail M. York, *Arizona State University*
Melissa Beresford, *Arizona State University, San José State University*

Abstract

Undergraduate research experiences (UREs) significantly enhance students' critical thinking, problem-solving, and teamwork skills, and foster pathways to graduate studies. Social science laboratory-based undergraduate research experiences (LUREs) offer similar benefits with more impact on the understanding of the research process and influence career direction. As online undergraduate programs increase, research opportunities must adapt to incorporate otherwise excluded remote students. This study employs an expert panel method that collects insights from 22 experienced lab leaders around meeting the substantial challenges of mentoring online students in social science lab groups. Through thematic analysis, four key challenges and proposed solutions to enable remote undergraduate students to successfully engage in research labs were identified. These solutions offer practical guidance to improve inclusivity and accessibility for online learners.

Keywords: *laboratory-based undergraduate research experiences, mentoring, remote learning, online students, social sciences*

doi: 10.18833/spur/8/4/4

As a high-impact practice, engagement in undergraduate research experiences (UREs) results in improved collaborative, analytical, critical thinking, and problem-solving skills, and fosters increased interest in pursuing graduate studies (Ishiyama 2002; Kilgo et al. 2015; Kuh 2008; Landrum and Nelsen 2002; Lopatto 2004). Importantly, within the natural and physical sciences, a majority of undergraduate research is conducted in labs (e.g., Barker 2010), whereas social science lab-based UREs (LUREs) are less common, but offer unique spaces to increase access for undergraduates to receive hands-on experience in real-world research projects (Becker 2019; Beresford et al. 2022; Dengah et al. 2016; Ruth et al. 2019; 2022; 2023a; 2023b; Stein et al. 2016; Weinschenk 2020). At the same time, more institutions are expanding their online education offerings. Accordingly, there is increasing information about, demand for, and institutional push to provide undergraduate students virtual/remote access to research experiences (Coleman 2022; Coleman and Daffin 2022; Erickson et al. 2022; Faulconer et al. 2024; Fey et al. 2020; Jensen-Ryan et al. 2021; Knox et al. 2024; LeFebvre 2023; Lincoln 2022; Ruth et al. 2022), which produce comparable student learning outcomes to in-person ones (Doctor et al. 2021).

This study complements Ruth et al.'s (2022) study of online social science research experiences, where students noted their appreciation for flexibility, increased access, and community building. It also builds upon Ruth et al.'s (2023a) research demonstrating that students who participate

in *social science* LUREs show a more defined career direction, enhanced comprehension of methodologies, increased proficiency in analyzing results, deeper insights into theoretical and practical applications, and improved ability to work alone and with a team. Incorporating students into the social science research lab has benefits for research mentors as well, such as building relationships with students, seeing students succeed, producing research output (peer-reviewed manuscripts and conference presentations), and increased satisfaction with work (Reilly 2023; Ruth et al. 2023a; 2023b). Given the demonstrated benefits of both LUREs and online research experiences, this study draws on interviews with twenty-two social science faculty research mentors to identify four key challenges to the inclusion of virtual students in LUREs and potential solutions to ensure access to high-quality research experiences.

Making (L)UREs available to online students is essential to improving access to powerful research experiences. Online education is moving from primarily attracting non-traditional students—for example, people older than 21, women, and first-generation—to drawing younger "traditional" college-aged students with over 53 percent of college students enrolling in online classes (Sánchez-Gelabert et al. 2020; NCES 2023). Particularly for online students, access to undergraduate research provides a connection to faculty and students not available otherwise (Ruth et al. 2022). Recent scholarship describes the design, function, and learning outcomes for social science labs (Becker 2019; Beresford et al. 2022; Dengah et al. 2016; Ruth et al. 2019; 2022; 2023a; 2023b; Stein et al. 2016; Weinschenk 2020), but does not focus on how to include online students. This article presents data from research mentors to address this.

Methods

An expert panel method (Galliers and Huang 2012; Kloser 2014; Lewthwaite and Nind 2016; Nind and Lewthwaite 2018) was used to collect data from 22 expert social science research mentors who direct or co-direct 20 laboratories and train students within the School of Human Evolution and Social Change at Arizona State University (ASU) and have expertise in teaching online (through ASU's Online program developed in 2010). Whereas previous work using the expert panel method has focused on teaching social science methods, this work uses this approach to gather pedagogical insights not captured with prior studies. Research mentors (RMs) were purposively recruited (Bernard 2017; Bernard et al. 2016) based upon four criteria: (1) varying lab mentorship experience (2-20 years), (2) leading labs of varying sizes (averaging 3 to 35 members each semester), (3) having worked with online students, and (4) representing a range of scholarly disciplines including archaeology, biological anthropology, cultural anthropology, environmental social science, epidemiology, medical anthropology, political science, and sociology. Through their lab experiences, they collectively train ~300 students each year, with approximately one-third of these students enrolled in online degrees.

RMs answered an online open-ended survey addressing questions regarding lab management strategies that meet both scientific and student training goals. Responses to two key survey questions are reported here: (1) what challenges RMs have encountered when integrating online students into their laboratories; (2) what has worked to address those challenges most successfully to serve remote students? The responses were recorded and transcribed using PhonicAI software, and the first author carefully reviewed and verified the transcripts for accuracy. The data were then imported into MAXQDA, a qualitative analysis tool. Using an inductive thematic coding approach (Bernard et al., 2016), the first author identified recurring themes within each question's responses. These themes were organized, summarized, and presented to the expert panel for their minor feedback, clarifications, and revisions. All panelists agreed to be coauthors, but their responses were anonymized, and each lab director (i.e., RM) was assigned a distinct identifier (e.g., RM01, RM02).

Challenge 1: Projects and Resources

"It has been difficult to integrate online students into my lab because I'm dealing with physical materials that are physically located in this space" (RM07).

Many of the RMs stated the issue of designing suitable projects (n = 13), with a handful in this study who work with physical materials (n = 9) and stress that "it's hard to integrate [online students] into a very hands-on profession" (RM05). Thus, one of the biggest challenges to incorporating online students is finding tasks that can be done remotely and contribute to ongoing research. These difficulties include accessing essential resources that are readily available in the lab. For example, "If students do not have the software and it's not available free via [the institution], they either cannot do the work or I have to find an alternative solution that might not mesh easily with established protocols" (RM06). Access to specialized software may be costly as well as require specific approvals. One RM mentioned, "we've had to get special permission to install software in someone's computer or get them access to restricted information on servers and that causes some issues" (RM17). Complications can also arise when there are Institutional Review Board (IRB) and ethical guidelines for protecting data. Additionally, labs that promote co-working on tasks in the same place find it difficult to "replicate some of the hands-on experiences" they use in the lab (RM01). Therefore, the types of research activities engaged in each lab strongly dictate the work that remote students can do. While sometimes difficult, certain strategies mitigate these issues and allow for meaningful engagement in lab tasks.

Solution to Project and Resource Challenges

Design Research Projects That Align with Remote Work. While online students may have limited access to resources, RMs (n = 12) have found specific data collection and analytic tasks that can be well-suited for remote work. This includes leveraging digital materials that can be accessed remotely, such as "data gathering from sources online" (RM21) as well as "archival research" (RM16; RM17; RM13) and entering this information into "a digital database" (RM06; RM17; RM18) or a "data entry form" (RM12). Other RMs have had students help with "literature reviews, data entry, coding, creating data visualizations, and assisting with manuscript writing and data analysis" (RM18), as well as "cleaning data that is already digitized" (RM08). Utilizing readily accessible software that is secured through the educational institution—such as Google Drive (including Google Sheets, Google Docs, etc.) or Dropbox—can help with data storage, organization, and collaboration. Digitization is key as once "all of the materials are digital, students have access to them through Dropbox" (RM20). Other potential activities include "building online surveys, [creating] annotated bibliographies, organizing data [including naming systems and alphabetization], and survey development and testing" (RM 08).

> A similar recommendation is to have "two different projects, an in-person project and an online project to make it work" (RM02). For example, "I have an online team and an in-person team for my historical archaeology project" with each team having a separate set of tasks (RM16). In-person students can do the first task of digitizing data. For instance, if working with paper surveys that need to be digitally centralized, in-person students can scan and upload them to a central digital location so everyone has access and can help with data entry. Alternatively, the in-person students can be tasked with the data entry and cleaning, and the online students are brought in to work on the data once digitized. This can also work for physical objects, such as having in-person students make "scans or photographs" that are then available digitally for analysis (RM07).

Challenge 2: Asynchronous Expectations

"The time zone incompatibilities can lead to challenges with having discussions with other members of the team" (RM18).

Students elect to take online courses for flexibility, but lab work is inherently a collaborative endeavor and necessitates regular meetings to ensure everyone is progressing forward on their tasks (Ruth et al. 2025a; Becker 2019). RMs (n = 13) noted that working together becomes more challenging when integrating remote students; "the biggest challenge with online and remote students is that many need to work asynchronously to manage their work or other life commitments" (RM18). Moreover, "if students are in places where they can't really be in the same meetings as everybody else because they have work or it's the middle of the night for them" (RM17), the timing poses challenges. Training and troubleshooting are more difficult without all lab members in one physical space. For example, supervising students remotely is challenging, "sometimes when you have students who drop off for two or three weeks, it's a concern, right? To be able to figure out how they are doing, where they are at?" (RM12). Therefore, having the flexibility of remote work limits the direct oversight possible and makes it more difficult to ensure the team is moving forward and overcoming obstacles together to complete the work.

Solutions to Asynchronous Challenges

1. *Provide a strong structure with asynchronous tasks*. In addition to assigning tasks that can be completed remotely, "Having work that can be done any time of the day or night is also really important because in person, we have specific lab hours, but that does not work for online students" (RM02). Thus, RMs stated (n = 5) that they must provide "a strong structure with very clear and explicit instructions" (RM08). This can be accomplished not only through virtual meetings to introduce tasks, share screens, and answer questions but also by recording those meetings and creating other training videos that can be referred to at any time. For example, "One of the grad students has recorded a number of video lessons on the key activities," and there are "written materials that students could go to, to see what we're expecting of them for that activity" (RM09). It is also important to communicate clear deadlines and provide support to students so they can complete tasks. Web-based, free project management tools can also assist with task management including task assignment and deadlines.
2. *Frequent check-ins*. RMs (n = 9) stressed that being accessible to online students and checking in regularly is key to overall lab success, "If I have someone actively working on a project with me, it's not uncommon for me to check in with them daily over text about their progress and have a weekly online meeting" (RM03). By setting up projects in Slack, students have "a constant communication channel to both me [the RM] and to the rest of the team" (RM13). Regular communications, via email or group chat platforms (e.g., WhatsApp, Signal, Discord) to check in on everyone and send out reminders, ensure that the project can keep moving forward if any challenges arise. The expectation of checking in weekly—through meetings, messaging, or emails—also helps keep students connected and prevents them from drifting away from the project. Thus, online UREs can require more personal interactions and active mentoring than typical online classes (Lincoln 2022).

Challenge 3: Building Community

"I think it can be difficult at points to work with online students in the sense that you only see them virtually, and sometimes but not always, it can be more difficult to get to know them and build trust in the same way that you do with the students that are joining you in person" (RM01).

The physical lab space allows lab members to come in and out as they please, dropping by between classes and attending during set hours. Often lab members engage in conversations, listen to music while working, and help each other as needed. RMs (n = 11) mentioned that students who work remotely cannot engage easily with other lab members, and the "challenge is when you're trying to integrate them with the in-person team" (RM16). RMs typically use Zoom meetings to try to have lab members in one space. But some RMs noted that mixed meetings can create "a very awkward discussion" because in-person students can be very engaged and the online students "don't know when to interact and how to really be a part of the conversation" (RM05). Online-only meetings—where everyone meets individually in a virtual space (e.g., Zoom room)—can also be tricky, as "it's harder [for students] to read people's faces and use visual cues to decide when it's okay to talk" (RM09). These difficulties of integrating the two sets of groups can cause "worry about their [online students'] isolation" (RM13).

Thus, there are difficulties in fostering a sense of community, building trust and rapport, and maintaining regular engagement and commitment with remote students, compared to in-person interactions in a research lab setting. While it is difficult to create community from afar, there are steps to create a sense of community and build relationships with online students.

Solutions to Community Building Challenges

1. *Create opportunities for engagement*. RMs (n = 7) ensure online students feel included by creating spaces that allow all lab members to participate in regular lab meetings, social activities, and communication channels. Utilizing technology is key, "Through Slack and Zoom students are able to feel more included as they have a constant communication channel to me and to the rest of the team" (RM13). Slack channels can be project-driven, career development/advice, and conduits for fun non-lab-related topics like "Instapot recipes" (RM13). Virtual meeting spaces, like Gather Town, provide unique online connection opportunities where in-person and online team members can interact in a virtual garden, lab, or library (RM13). During online meetings, it is also important to set aside time for personal interactions, for example, "every session we have about five minutes where we just randomly put people into breakout rooms at the beginning and sometimes we give them icebreakers, sometimes we just let them talk on their own and it's always different people so they have a chance to mingle before the lab meeting" (RM09). Others have "created working sessions" where students join Zoom and "they're all working together, listening to music, so they feel like they're in the same room, even if they're in different places" (RM17). And one RM mentioned arranging for the lab team to meet up at a regional conference.
2. *Dedicated meetings for different groups*. While some RMs have been very successful "always setting up lab meetings as a hybrid option so students can join via Zoom" (RM18), and in-person students can join physically in the lab space, others (n = 5) have found integrating both in-person and online students in one "space" difficult. As such, they prefer to "bracket off the in-person students versus the online students" (RM16) and meet with them separately. Some use a mix of both strategies depending on the number of students, for example, "We've had hybrid meetings where in-person and online students are meeting together. Other times when we had more online students [we] will have a separate online-only group" (RM01). Any online meetings, however, should be recorded and posted for viewing for anyone who missed the meeting or needs to refer to the information covered to complete lab tasks.

Challenge 4: Increased Time and Workload

"[Integrating online students] really does double the amount of work in terms of projects and supervision and mentoring" (RM02).

The common thread woven through the previous challenges and solutions—projects, resources, building community, training, supervision, and meetings—is the extra time needed to be successful. RMs (n = 8) stressed that there is an added workload when incorporating online students into their laboratories. For example, one RM who works with physical materials and has been slower to incorporate online remote work stated, "It's just a matter of putting the time into actually setting up." (RM14). Another RM who works with physical materials and lamented the difficulties of designing projects to incorporate online students commented, "I suppose one response could just be that I have to do more to make it work. But the extensive opportunity costs to expand beyond a very finite body of tasks specifically for remote students is high for me depending on the semester and the students" (RM06). Even if not working with physical materials, as noted above in Challenge 1, some RMs find it best to have separate sets of activities for in-person and online students, which automatically increases workload.

Solutions to Increased Time and Workload Challenges

1. *Hierarchical lab reporting structure*. RMs (n = 13) that include a hierarchical supervision structure for their lab share the mentoring and leadership responsibilities. For

instance, one RM has lab positions set up as "postdocs, graduate students, honor students, senior lab interns, and junior lab interns" and expects that more senior members will take a leadership role and that "each level will communicate to the level above them so that we can keep all of the projects on track" (RM03). Therefore, lab members can help with the day-to-day management and build their mentorship skills by supervising other lab members.

2. *Record training videos*. Similar to recording Zoom meetings and creating videos explaining specific tasks, some RMs (n = 4) have created basic research training that all new members need to complete. For instance, "students go through a structured training program for the first eight weeks. They do a series of online modules that walks them through the entire arc of the social science research process from ethics and research design all the way through to sampling, data collection, data analysis, discerning findings, and reporting results" (RM19). The time upfront is considerable, but once created, it can be re-used in future semesters and repurposed for venues which can free up the RM's time for other tasks.
3. *Institutional support*. While the RMs in this sample work in institutions that support online education, there are still demands beyond the typical workload of running an in-person lab. Given the time and energy that needs to go into the set up and maintenance of online access to lab research, "There needs to be even more university-wide support with as few barriers as possible on software and resources" (RM06). For instance, RMs (n = 17) noted using programs like Slack, Zoom, and Dropbox, which need to be obtained through the institution for cost and security. Because the institution values incorporating students, a few RMs have been awarded internally funded grants to develop their online research lab. It is also important for promotion and evaluation that leadership recognizes and rewards the extra effort that it takes to incorporate online students into working research labs.

Conclusion and Recommendations

Using thematic analysis, four key challenges were identified to incorporating online and remote students into laboratory UREs. These findings underscore the importance of deliberate planning to establish projects for online students, and the necessity of well-designed structures and processes to integrate these students into existing labs. Perhaps unsurprisingly, the analysis also highlights the significant mentor time, effort, and resources needed to set up online activities. One implication is that these strategies are best-suited for RMs who intend ongoing engagement with online students. Many of the strategies for managing online social science research experiences mimic those for in-person laboratory teams, including hierarchical reporting structures, clear procedures, and recording training modules (Ruth et al. 2025a; 2025b). The use of readily available technology tools – Google Drive, Dropbox, Slack—can help align the team who are not synchronous (see also, Fey et al. 2020; Jensen-Ryan et al. 2021). Additionally, this study further bolsters the benefits of integrating students with varying expertise who can help more novice learners (Fey et al. 2020). Importantly, a wider range of students can be engaged in research, also enriching the instructor experience (Ruth et al. 2025a).

In a prior study with social science students, in-person students who worked remotely during the pandemic lamented a lack of community and belonging, whereas online students noted an increased sense of community because they were fully online with no other personal interactions with other students and faculty (Ruth et al. 2022). Recent research in the natural and physical sciences found that while some students struggle with the remote aspect of conducting research, others gain valuable skills in remote collaboration (Fey et al. 2020) as well as professional socialization, networking, and learning about graduate programs (Erikson et al. 2022). Balancing the needs of in-person and online students is a significant practical challenge within social science research laboratories. Further research exploring how laboratory structures impact student learning and career aspirations, comparing differences in outcomes between in-person students and online students, should help online RMs further identify best practices and workable solutions.

Data Availability

Data is not available as participants in this study did not provide written consent to share their data.

Institutional Review Board

This study was approved by Arizona State University's IRB (STUDY00019370).

Conflicts of Interest Statement

The authors have no conflicts of interest to declare.

Acknowledgments

This work was supported in part by the U.S. National Science Foundation under grants BCS-1759972, BCS-2051369, BCS-2143766, BCS-2318505, DEB-1832016, EEC-1449500, GCR 2021147, HNDS-I 2121925, HNDS-R 2212898, NNA-192823, NNA-2127348, NNA-2318376, SBE-2017491, SBE/SMA 2105424, SES-1948197, SES-2423785; the Institute for Social Science Research, ASU; the Leakey Foundation; the Maricopa County Department of Public Health C-86-24-096-X-01; Russell Sage Foundation under grants 1905-15844 and 2307-44823. The authors also thank the College of Liberal Arts and Sciences Online Undergraduate Scholars Program at Arizona State University.

References

Barker, Kathy. 2010. *At the Helm*. 2nd ed. Cold Spring Harbor, NY: Cold Spring Harbor Laboratory Press.

Becker, Megan. 2019. "Importing the Laboratory Model to the Social Sciences." *Journal of Political Science Education* 6(2):212–224. doi: 10.1080/15512169.2018.1505523

Beresford, Melissa, Amber Wutich, Margaret V. du Bray, Alissa Ruth, Rhian Stotts, Cindi SturtzSreetharan, and Alexandra Brewis. 2022. "Coding Qualitative Data at Scale." *International Journal of Qualitative Methods* 21: 1–15.

Bernard, H. Russell. 2017. *Research Methods in Anthropology*. Lanham, MD: Rowman & Littlefield.

Bernard, H. Russell, Amber Wutich, and Gery W. Ryan. 2016. *Analyzing Qualitative Data*. London: SAGE.

Coleman, Jennifer C. 2022. "Online Education and the Need for Undergraduate Research." In *Undergraduate Research in Online, Virtual, and Hybrid Courses*, eds. Jennifer C. Coleman, Nancy H. Hensel, and Willam E. Campbell, 23–34. New York: Routledge.

Coleman, Jennifer C. and Lee W. Daffin. 2022. "Online Undergraduate Research in Behavioral Sciences." In *Undergraduate Research in Online, Virtual, and Hybrid Courses*, eds. Jennifer C. Coleman, Nancy H. Hensel, and Willam E. Campbell, 63–74. New York: Routledge.

Dengah II, HJ Francois, Erica Hawvermale, Essa Temple, McKayla Montierth, Talon Dutson, Tyler Young, Elizabeth Thomas, Kirsti Patterson, Abigail Bentley, and David Tauber. 2016. "Using a Research Laboratory Model to Engage Students in Cognitive Anthropological Research." *Annals of Anthropological Practice* 40(2):178–192. doi:10.1111/napa.12100

Doctor, Erika L., Melissa Lehman, and Cassandra Korte. 2021. "Implementing CUREs with Cookbook-Style Laboratory Exercises in In-Person, Online, and Hybrid Formats." *Journal of Microbiology & Biology Education* doi: 10.1128/jmbe.v22i1.2573

Faulconer, Emily, Brent Terwilliger, Robert Deters, and Kelly George. 2024. "Guiding Undergraduate Researchers in the Virtual World: Mentoring Experiences of Globally Distributed Students." *OJDLA* 27 (1):1.

Erickson, Olivia A., Rebecca B. Cole, Jared M. Isaacs, Silvia Alvarez-Clare, Jonathan Arnold, Allison Augustus-Wallace, Joseph C. Ayoob Alan Berkowitz, Janet Brancha, Kevin R. Burgio, et al. 2022. "'How Do We Do This at a Distance?!' A Descriptive Study of Remote Undergraduate Research Programs During COVID-19." *CBE—Life Sciences Education* 21(1): 1–16. doi: 10.1187/cbe.21-05-0125

Fey, Samuel B., Meredith E. Theus, and Aaron R. Ramirez. 2020. "Course-based Undergraduate Research Experiences in a Remote Setting: Two Case Studies Documenting Implementation and Student Perceptions." *Ecology and Evolution* 10(22):12528–12541. doi: 10.1002/ece3.6916

Galliers, Robert D., and Jimmy C. Huang. 2012. "The Teaching of Qualitative Research Methods in Information Systems." *European Journal of Information Systems* 21(2):119–134. doi: 10.1057/ejis.2011.44

Kilgo, Cindy, Jessica Sheets, and Ernest Pascarella. 2015. "The Link between High-Impact Practices and Student Learning." *Higher Education* 69(4):509–525. doi: 10.1007/s10734-014-9788-z

Kloser, Matthew. 2014. "Identifying a Core Set of Science Teaching Practices." *Journal of Research in Science Teaching* 51(9):1185–1217. doi: 10.1002/tea.21171

Knox, Corey J., Faqryza M. Ab Latif, Natasha R. Cornejo, and Michael D. Johnson. 2024. Mentoring Across Difference and Distance: Building Effective Virtual Research Opportunities for Underrepresented Minority Undergraduate Students in Biological Sciences. *Mbio* 15(1):e0145223. Doi: Knox, Corey J., Faqryza M. Ab Latif, Natasha R. Cornejo, and Michael D. Johnson. 2024. Mentoring Across Difference and Distance: Building Effective Virtual Research Opportunities for Underrepresented Minority Undergraduate Students in Biological Sciences. *Mbio* 15(1):e01452–23. doi: 10.1128/mbio.01452-23

Kuh, George D. 2008. "Excerpt from 'High-impact Educational Practices: What they Are, Who Has Access to Them and Why they Matter'." *Association of American Colleges and Universities* 14(3):28–29.

Ishiyama, John. 2002. "Does Early Participation in Undergraduate Research Benefit Social Science and Humanities Students?" *College Student Journal* 36(3):381–387.

Jensen-Ryan, Danielle, Courtney J. Murren, April Bisner, Matt T. Rutter, and Allan Strand. 2021. "Engaging Undergraduates in Research Experiences at a Distance: Insights and Recommendations for Remote UREs" *Journal of Microbiology & Biology Education* 22(1):10–1128. doi: 10.1128/jmbe.v22i1.2375

Landrum, R. Eric and Lisa R. Nelsen. 2002. "The Undergraduate Research Assistantship." *Teaching of Psychology* 29(1):15–19. doi:10.1207/S15328023TOP2901_04

LeFebvre, Rebecca. 2023. "Implementing Undergraduate Research in an Online Gateway Political Science Course." *Scholarship and Practice of Undergraduate Research* 6 (3): 9–16. doi: 10.18833/spur/6/3/4

Lewthwaite, Sarah and Melanie Nind. 2016. "Teaching Research Methods in the Social Sciences." *British Journal of Educational Studies* 64(4):413–430. doi: 10.1080/00071005.2016.1197882

Lincoln, Tami. 2022. "From Observers to Active Participants." In *Undergraduate Research in Online, Virtual, and Hybrid Courses*, eds. Jennifer C. Coleman, Nancy H. Hensel, and Willam E. Campbell, 139-150. New York: Routledge.

Lopatto, David. 2004. "Survey of Undergraduate Research Experiences (SURE)." *Cell Biology Education* 3(4):270–277. doi: 10.1187/cbe.04-07-0045

National Center for Education Statistics (NCES). 2023. Department of Education, Integrated Postsecondary Education Data System (IPEDS), Fall Enrollment component final data (2012 - 2022) and provisional data (2023). Accessed January 17, 2025. https://nces.ed.gov/ipeds/TrendGenerator/app/answer/2/42

Nind, Melanie and Sarah Lewthwaite. 2018. "Hard to Teach: Inclusive Pedagogy in Social Science Research Methods Education." *International Journal of Inclusive Education* 22(1):74–88. doi:10.1080/13603116.2017.1355413

Reilly, Shauna. 2023. "Working Smarter by Engaging Students in Political Science Research." In *The Palgrave Handbook of Teaching and Research in Political Science. Political Pedagogies*, Eds. Charity Butcher, Tavishi Bhasin, Elizabeth Gordon, Maia Carter Hallward, 127–135. London: Palgrave Macmillan, Cham.

Ruth Alissa, Alexandra Brewis, Melissa Beresford, Micheal E. Smith, Christopher Stojanowski, Cindi SturtzSreetharan, and Amber Wutich. 2023a. "Lab-based Undergraduate Research Experiences (LUREs)." *Scholarship and Practice of Undergraduate Research* 7(1):43–53. doi: 10.18833/spur/7/1/3

Ruth, Alissa, Alexandra Brewis, Melissa Beresford, and Christopher M. Stojanowski. 2023b. Research Supervisors and Undergraduate Students' Perceived Gains from Undergraduate Research Experiences in the Social Sciences. *International Journal of Inclusive Education*. doi: 10.1080/13603116.2023.2288642

Ruth, Alissa, Alexandra Brewis, Cindi SturtzSreetharan, Amber Wutich, and Christopher Stojanowski. 2022. "Effectiveness of Online Social Science Undergraduate Research Experiences." *Frontiers in Education*. doi: 10.3389/feduc.2022.849908

Ruth, Alissa, Kelly J. Knudson, Christopher M. Stojanowski, Christopher R. Caseldine, Matthew V. Kroot, Kostalena Michelaki, Christopher Morehart, Matthew A. Peeples, Kathryn L. Ranhorn, Michael E. Smith, and Davina R. Two Bears. 2025a. The Archaeology Research Laboratory: A Site for Increased Access to Student Training. *[Manuscript submitted for publication]*

Ruth Alissa, Cindi SturtzSreetharan, Melissa Beresford, Alexandra Brewis, Shauna BurnSilver, Caitlin Drummond Otten, Emire Estrada, Daniel J. Hruschka, Elisabeth Ilboudo Nébié, Megan Jehn, Jonathan N. Maupin, Robin G. Nelson, Amber Wutich, and Abigail York. 2025b. How to Organize Undergraduate Lab Training: Evidence from 10 Working Social Science Research Labs. *[Manuscript submitted for publication]*

Ruth, Alissa, Amber Wutich, and Alexandra Brewis. 2019. "A Model for Scaling Undergraduate Research Experiences." *International Journal of Mass Emergencies and Disasters* 37(1):25–34. doi: 10.1177/028072701903700103

Sánchez-Gelabert, Albert, Riccardo Valente, and Josep M. Duart. 2020. "Profiles of online students and the impact of their university experience." *International Review of Research in Open and Distributed Learning* 21(3): 230–249. doi: 10.19173/irrodl.v21i3.4784

Stein, Maz J., Ashley Daugherty, Isabella Rivera, Jessica Muzzo, and Christopher D. Lynn. 2016. "Thinking Outside Anthropology's Box." *Annals of Anthropological Practice* 40(2):164–177. doi: 10.1111/napa.12099

Weinschenk, Aaron C. 2020. "Creating and Implementing an Undergraduate Research Lab in Political Science." *Journal of Political Science Education* 17(sup1):284–296. doi: 10.1080/15512169.2020.1795873

Alissa Ruth
Arizona State University, alissa.ruth@asu.edu

Alissa Ruth is an educational anthropologist in the School of Human Evolution and Social Change at Arizona State University in Tempe. Her research focuses on delivering and assessing undergraduate research experiences and how to best train students on research methods.

Cindi SturtzSreetharan is a linguistic anthropologist in the School of Human Evolution and Social Change at Arizona State University. Her research focuses on language as social action with a particular focus on language in contexts of identity work.

Melissa Beresford is an associate professor of anthropology at San José State University and a faculty affiliate in the Center for Global Health at Arizona State University. Her research leverages mixed-methods community-based research and global collaborative partnerships to investigate how people adapt to water insecurity. She is the director of the Community of Practice for the National Science Foundation Cultural Anthropology Methods Program and the vice chair of the Water Insecurity Research Community of Practice.

Alexandra Brewis is a Regents and President's professor of anthropology in the School of Human Evolution and Social Change at Arizona State University in Tempe, where she also founded the Center for Global Health. Her collaborative program of research focuses on identifying and testing biocultural mechanisms that connect culture, environment, and health with the goal of designing better solutions to complex global health and environmental challenges.

Shauna B. BurnSilver is an associate professor of environmental social science in the School of Human Evolution and Social Change at Arizona State University. She examines social processes and networks in the Arctic, which shape communities and diverse rights- and stake-holder decisions in response to change. Her work is transdisciplinary and collaborative, grounded in processes of knowledge co-generation to engage with driving questions around climate change, equitable governance, power and justice.

Chris Stojanowski is a bioarchaeologist in the School of Human Evolution and Social Change at Arizona State University. His research focuses on dental anthropology and evolutionary processes in archaeological populations.

Christopher R. Caseldine is an assistant research professor in the School of Human Evolution and Social Change at Arizona State University, and the curator of collections for the Center for Archaeology and Society Repository at Arizona State University.

Caitlin Drummond Otten is an assistant professor of decision science in the School of Human Evolution and Social Change at Arizona State University. She studies how individuals understand and use scientific evidence when making decisions, with a focus on decisions related to the environment and sustainability.

Emir Estrada is a sociologist in the School of Human Evolution and Social Change at Arizona State University.

Her award-winning book, Kids at Work: Latinx Families Selling Food on the Streets of Los Angeles, documents how the children of undocumented street vendors in LA become economic co-contributors. Her new book project focuses on the return migration of Mexican retirees.

Daniel J. Hruschka is a medical anthropologist and epidemiologist in the School of Human Evolution and Social Change at Arizona State University. His work examines the social determinants of health, with a focus on wealth and ethnic-based discrimination and privilege. His work brings together in-depth fieldwork in rural Bangladesh with analysis of large-scale international datasets.

Elisabeth Ilboudo Nébié is an assistant professor at Arizona State University where her research centers on the human dimensions of environmental change in the Sahel region of West Africa. She is trained as an applied anthropologist and international development practitioner. She is the director of Global Initiatives for the National Science Foundation Cultural Anthropology Methods Program.

Megan Jehn is a professor in the School of Human Evolution and Social Change at Arizona State University. Her community-based public health work explores the resilience of social-ecological systems to disasters.

Kelly J. Knudson is a professor in the School of Human Evolution and Social Change, where she also directs the Center for Bioarchaeological Research and the Archaeological Chemistry Laboratory. Her research focuses on human responses to climate change and mobility and migration in the past through biogeochemistry.

Matthew V. Kroot is an assistant professor in the School of Human Evolution and Social Change at Arizona State University. He specializes in the analysis of knapped stone materials and is interested in a range of topics related to political economy and agency. He also focuses on community-based collaboration and teaching in his research programs.

Jonathan Maupin is an associate professor of anthropology in the School of Human Evolution and Social Change at Arizona State University. His work focuses on health and development in Guatemala and addresses issues of community participation in health programs, cultural models of health, and social norms.

Kostalena Michelaki is an associate professor in the School of Human Evolution and Social Change at Arizona State University. Her research focuses on prehistoric ceramic technologies and the use of various archaeological science methods to answer questions about prehistoric ways of daily life.

Christopher Morehart is an associate professor in the School of Human Evolution and Social Change at Arizona State University. His research focuses on the historical political ecology and ethnobotany of complex societies.

Robin G. Nelson is an associate professor of anthropology in the School of Human Evolution and Social Change at Arizona State University. Her research applies evolutionary theory to community-engaged biocultural studies of social support, psychosocial stress, and health across the lifespan in contemporary Caribbean and US-based populations. She is also the Director of Strategic Engagement for the NSF Cultural Anthropology Methods Program.

Matthew A. Peeples is an associate professor and archaeologist in the School of Human Evolution and Social Change. He conducts research in the US Southwest and Mexican Northwest focused on interaction and formal social networks. Much of his work involves computational models and large-scale archaeological data compilations.

Kathryn L. Ranhorn is a research scientist at the Institute of Human Origins and Assistant Professor in the School of Human Evolution and Social Change. Her research focuses on the evolution of human social behavior through community collaborative paleoanthropology and material culture.

Michael E. Smith is a professor of archaeology in the School of Human Evolution and Social Change at Arizona State University. He has conducted archaeological fieldwork at Aztec sites in Mexico and directs comparative transdisciplinary urban projects. Smith involves many undergraduate students (online and in-person) in his projects. His book, At Home with the Aztecs: An Archaeologist Uncovers Their Daily Life *(2016) won the best popular book award from the Society for American Archaeology.*

Christopher M. Stojanowski is a professor in the School of Human Evolution and Social Change at Arizona State University. His research focuses on phenotypic variation and its application toward historical questions in the past.

Amber Wutich is a MacArthur Fellow, Regents and President's Professor of anthropology, and director of Arizona State University's Center for Global Health. Her cross-cultural and community-based fieldwork examines the relationship between water insecurity and human well-being. She directs the NSF Cultural Anthropology Methods Program and NSF Action for Water Equity Consortium.

Abigail York is a professor of governance and public policy in the School of Human Evolution and Social Change at Arizona State University. York's work focuses on collective action to adapt to environmental change. She has led several graduate training initiatives including co-founding Earth Systems Science for the Anthropocene.