Applying Active Learning in Undergraduate Research Methods

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ABSTRACT This article introduces a bundle of active learning activities for an introductory undergraduate course in research methods. In particular, the activities aim to help students develop core knowledge and skills that provide a foundation for reading and conducting quantitative and qualitative research. Active learning is a pedagogical practice with well-established benefits such as better student attitudes and improved content comprehension and application. I build on this conventional wisdom by applying a student-centred evaluation method, demonstrating that students perceive active learning as an effective complement to traditional lecturing and assignments for learning core methodological topics in political science.

Political science curricula vary across departments, but most programs require that their undergraduate students complete at least one "scope and methods" course (Turner and Thies 2009, 367). Over time, emphasis on "practical" research skills has come at the expense of exposing students to the broad contours of the discipline (Lewis-Beck 2001). This gradual shift has resulted in most political science departments obliging their undergraduate students to take one or more research methods courses centered around interpreting and applying regression analysis. More recently, additional emphasis has been placed on formally training students to read and conduct qualitative research (Elman, Kapiszewski, and Kirilova 2015). Nevertheless, positivist approaches prioritizing statistical analysis continue to dominate the syllabi of required undergraduate methods courses, which is evidenced by the assigned textbooks and assignments across a broad sample of "scope and methods" courses among American political science departments (Turner and Thies 2009, 369–70). This is concerning because a narrow methods curriculum may not prepare students to comprehend the diverse range of epistemological and methodological approaches to research practiced by political scientists, especially outside of the United States.

Another concern with the state of undergraduate political science methods teaching is the paucity of active-learning techniques used in the classroom. Although there are no specific data on introductory methods courses, in a study of 491 political science "gateway courses" (e.g., introduction to international relations and introduction to American politics), fewer than 15% use "one or more" active-learning techniques, and an average of only 12.8% of the grade allocation is contingent on active learning across courses in the sample (Archer and Miller 2011, 431–32). With due respect to the traditional lecture-driven approach, ample research suggests that the incorporation of active and collaborative learning into an undergraduate course provides learning, emotional, and social benefits for students (Aguado 2009; Archer and Miller 2011; Campisi and Finn 2011; Fisher and Justwan 2018; Hendrickson 2021; LaCosse et al. 2017; Wolfe 2012). Moreover, extant research also reports a positive relationship between active learning and both student interest in the material and their motivation for learning (e.g., Hendrickson 2021). This finding is particularly relevant to research methods courses because students, on average, are not enthusiastic about them (Aguado 2009; Earley 2014; Wisecup 2017). Active learning is an umbrella concept for activities such as in-class debate, written reflection, and applied exercises that engage students in the learning process (Prince 2004). Collaborative learning, according to Wolfe (2012, 421), "uses small groups to increase student knowledge and enhance higher-order thinking skills." In practical terms, the execution of collaborative learning inside of the classroom occurs through the conduit of active-learning exercises.

Most instructors would agree with Adams (2001, 3) that teaching research methods to a large undergraduate class is "one of the toughest teaching assignments in academia." Sharing teaching resources with our colleagues is a meaningful way to lessen the burden on those who bravely volunteer to teach methods courses. Accordingly, this article joins the growing collection of published works that detail active-learning exercises ready for adoption by

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methods instructors (Aguado 2009; Bernstein and Allen 2013; Fisher and Justwan 2018; LaCosse et al. 2017). However, the existing body of work mainly offers exercises relevant to regression analysis, making this study distinct because its activities concentrate on foundational principles of epistemology and research design that are essential for understanding and applying quantitative and qualitative research techniques. I draw on my experiences in the classroom and two student surveys across two semesters to assess the impact of the activities from the students' viewpoints, and I offer suggestions for instructors who are seeking to integrate the strategies into their methods course.

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CONTEXT AND DATA COLLECTION

The active-learning activities were prepared for a 200-level course titled "Investigating Politics" (POL 200) that is required for political science majors (see table A.1 in the online appendix for the course outline). The course emphasizes the fundamentals of epistemology, methodology, and research design to help students become critical consumers of political research, thereby providing a solid foundation they can build on to produce original research. In other words, the overarching learning goal is to put students on the path toward becoming "information-literate" citizens (Marfleet and Dille 2005, 176).

I have been the primary faculty instructor for POL 200 since its addition to the departmental curriculum in Fall 2016. I implemented the exercises described herein beginning in the Fall 2018 semester and continue to use and update them. The course syllabus allocates a significant portion of the final course grade to performance in the group-based active-learning exercises. Although objective evaluation of individual performance in collaborative exercises is challenging, it is vital to send a signal to students that the activities are integral to success in the course.

Instead of choosing a substantive research topic to work on throughout the course, all students interact with the same stylized examples in the activities and assignments. The position of Elman, Kapiszewski, and Kirilova (2015, 40) that undergraduate training in research methods should enable students to understand "how social science knowledge is derived, how intellectual consensus forms, and how claims are contested and conventional wisdom overturned" informed this modification to the course structure. Some scholars suggest that having students work with topics that substantively interest them stimulates additional motivation and learning (e.g., Aguado 2009). However, doing so has a potential drawback: many students become overwhelmed by the dual task of pursuing substantive research—probably for the first time—while absorbing vast amounts of methodological information and applying new skills.

The activities are suitable for both large classes (i.e., 50-plus students) with graduate students serving as teaching assistants (TAs) and small- to medium-sized classes (i.e., 20–50 students). When teaching a group of approximately 40 students, I disseminate relevant lecture material in digestible "chunks" (e.g., 20 minutes) and follow that teaching with an activity that reinforces the material. When the class is large and students participate in a 1-hour TA-led "tutorial" with approximately 20 peers following the lecture, the activities occur in these sessions. I describe each activity following the relevant bout of lecture content and provide instructions to the TA to orchestrate the activity in the tutorial session.[1]

I allot 30 minutes for each activity but, in practice, the actual running time varies depending on contextual circumstances (e.g., How well are students grasping the material? What other tasks are scheduled for the class or tutorial?). This leaves sufficient time in a 1-hour tutorial or class session for a whole-group debriefing to ensure that students are meeting the learning objectives of the exercise.

I draw on my experiences in the classroom and two student surveys across two semesters to assess the impact of the activities from students' viewpoints, and I offer suggestions for instructors who are seeking to integrate the strategies into their methods course.

I randomly assemble groups for each specific activity. This contradicts the recommendation from the literature on team-based learning that maintaining stable groups across the semester generates camaraderie and intragroup accountability (e.g., Stein, Colyer, and Manning 2016). Either option is viable, but I chose randomization to widen the students' exposure to different perspectives throughout the semester. Moreover, the course syllabus informs students that an assessment of the quality and quantity of their participation is worth 25% of their final grade.[2] This provides ample motivation for most students to contribute to their group during the activities.

I administered a post–pre-survey after two separate course offerings using the same active-learning activities to evaluate whether students perceived an improvement in their capacity to understand empirical research and to execute essential elements of the research process (e.g., develop a research question). In addition, two-open ended questions were included in the survey to corroborate and contextualize the quantitative data (Jeram 2023).

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EXAMPLES OF ACTIVE-LEARNING ACTIVITIES

This section provides examples of active-learning activities implemented for this study. The remaining activities are described in the online appendix.

Epistemology and the Quantitative–Qualitative Divide

A solid grasp of the epistemologies—that is, what constitutes valid knowledge and how can it be obtained—that underly political science research empowers students to critically evaluate varied research styles and make informed choices when conducting their research. In the lecture, I present this crude distinction between positivism and interpretivism: there is an affinity between one's epistemology and research style (i.e., qualitative or quantitative). This distinction is not perfect but it serves as a practical entry point for students to develop their understanding of how a researcher's epistemological lens shapes their research choices (Marsh and Furlong 2002). I then ask students to form small groups (i.e., 3–4) and to imagine that they constitute a research team examining the question: "Why do younger people vote less on average than adults over 50?" As they brainstorm potential research paths to answer this question, I instruct students to discuss how their research group's epistemological lens has influenced their approach.

In the summary discussions that follow this activity, I have observed students grasp the fact that varied definitions of what constitutes "good knowledge" exist in political science. Students have provided suggestions such as: "It is important to talk to young people, get to know their feelings, concerns, and hopes for the future," which suggests an interpretative approach. Other students have gravitated toward positivism, arguing that the research should focus on "key factors" driving the relationship between age and voter turnout. After the groups present their suggestions, I ask students to reflect on whether a researcher's epistemology is implicit or explicit or—in the words of Marsh and Furlong (2002)—more akin to "skin or a sweater." This leads naturally into a broad discussion of the implications that being bound to an epistemology may have on the progress of different research agendas in political science.

Research Questions

In the lecture on research questions, I ask students to raise their hand if they have a research question suitable for an empirical inquiry to share with the class. Their answers inevitably reveal that their focus is on the topic rather than the type of inquiry that the question demands. This provides a segue to my lecture slide that presents the prominent styles of research questions in political science: descriptive, theoretical, and explanatory (Minkoff 2016). The critical learning goal of the activity is for students to become familiar with the types of research questions and their attributes. First, this enables them to evaluate research based on an author's goals. For example, critiquing a descriptive article as having "weak explanatory power" does not make sense. Second, it empowers students to confidently select the most relevant articles when they conduct a literature review for their research.

For this exercise, students work in pairs rather than groups. Students first work individually to think of a topic to which they believe political scientists should give more attention. The pair then engages in a brief discussion to share their ideas. Next, each student is responsible for writing a descriptive, theoretical, and explanatory question on the topic that their partner suggested. Finally, they reconvene to discuss and revise their questions to meet the criteria for each type of question. I have observed that students come away from this activity with a better understanding of how the phrasing of a question influences the type of data required to answer it.

A subsequent activity related to research questions reinforces for students the importance of establishing the significance of a project (Howard 2017, 14). When they enroll in their first methods course, most students have yet to consider their research and writing as an opportunity to reach an interested audience rather than an obligation to their instructor. In the lecture, I discuss Howard's (2017, 27–28) three "tricks of the trade" that scholars use to establish the importance of their research: "arguing that their particular project will shed light on a fundamental problem in politics, portraying the research as a solution to some tangible problem, and appealing to widely held values." An instructor can select any article for this exercise. However, in my experience, a qualitative single-case study in a thematic or general—rather than an "area"—journal is preferable because it is more likely that the article will explain why the question is relevant beyond the specific case(s) addressed.

I assign the article's introduction as required reading. I again ask my students to form small groups to answer the following two questions about what they read: (1) How does author X use Howard's tricks of the trade to grab the audience's attention? Do you think the author uses these tricks effectively? (2) Which audience (e.g., academics, policy makers, and specialists) do you think author X is trying to reach? Finally, after the debriefing, I direct students to think about which audiences may be interested in a previous research paper they had written and how they might modify its introduction accordingly.

The Literature Review

Empowering students to understand the architecture and purposes of the formal literature review starts them on the path to confidently writing their own. At this stage, most students conceive of a literature review as a "laundry list" of the arguments presented by the scholars they read on their topic. To advance their understanding, my lecture introduces the heuristic "schools of thought" using the categories of structural, institutional, and ideational explanation (Parsons 2007). Golder's (2016) collection of mini-literature reviews on subtopics within the broader literature on far-right parties is a good choice for this exercise because it provides multiple practice opportunities. Students first read the "Explanations" section of the paper. I then instruct them to work in small groups to reorganize the literature review using the institutional, structural, and ideational categories. I have observed that students begin to home in on the purpose of the literature review—that is, to organize and communicate the extant relevant research while positioning their novel contribution within that "literature"—when they are completing this exercise. Comments during debriefing sessions and student feedback have highlighted other essential lessons that they learn during this exercise. First, there is no universal method to categorize and sort contributions into "schools"; composing a literature review is as much an art as a science. For example, I have noted that students initially quibble over whether an argument is structural or institutional but then overcome such uncertainty, recognizing that not all ideas fit discreetly into one category. Second, their written assignments

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following this exercise show that they become more comfortable narrowing down their work to include only the distinct relevant arguments without fretting about "leaving out most of what [they] I read."[3]

Correlation and Causality

Students enter their first methods course generally knowing that "correlation does not equal causation." Nevertheless, they struggle to understand how a researcher should work toward establishing a causal relationship between two or more concepts. Moreover, many students find the reality of a political world in which "connections between cause and effect are often elusive and complicated" to be challenging because it takes them out of their comfort zone of thinking in superficial cause–effect relationships (Howard 2017, 81). The learning goal for this exercise is to improve their comprehension of a vital technique that political scientists use to move beyond correlation toward causal inference: causal mechanisms. Political scientists interested in explanation generally agree that the "specification of causal chains distinguishes propositions about causes from propositions about correlations" (Gerring 2010; Mayntz 2004, 241). In other words, there is a baseline expectation that empirical research demonstrating a covariational result should be accompanied by an exposition of *how* X causes Y. I use the following active-learning activity to help students open the "black box" of causation. I distribute a table (table 1) in electronic or paper form for the students to work through in small groups. The purpose of the table is not to instigate discussion about the causes of civil war or other phenomena that political scientists want to understand. Rather, it is to help students recognize that difficult-to-"see" causal mechanisms drive the cause–effect relationships that we observe in the social world. For example, stating that wealth—measured by income or another appropriate measure—affects vote choice does not tell us *how* such a causal relationship arises (Imai et al. 2011). Therefore, the task for small groups to discuss and write down, for instance, how the executive structure of the state might affect its party system can help them begin to comprehend causation as a *process*. Moreover, the exercise underscores the requirement of substantial evidence and sound logical inferences to make a convincing causal argument.

After the groups complete the table, I ask whether there is a clear distinction between independent variables and causal mechanisms. This prompt always leaves students puzzled, but for a good reason: political scientists disagree about whether causal mechanisms are simply a "chain of observable intervening variables that connect the original posited cause and the ultimate effect" or difficult-to-observe—often contingent—pathways by which an effect is produced (Falleti and Lynch 2009, 1146; King, Keohane, and Verba 1994, 85–87). During the debriefing session, I return the discussion to epistemology, encouraging students to recognize that researchers' epistemology affects their stance on what defines a causal mechanism and, thus, the evidentiary burden of establishing causal inference. This has always been one of the most challenging exercises for students. Nevertheless, it helps them become more comfortable with the uncertainty of causality in the political world. As one student remarked after completing the exercise: "I wish understanding politics was straightforward like gravity, but I guess it isn't."

Table 1

Causation Activity

Unit of Analysis	Independent Variable	Causal Mechanism	Dependent Variable
Individual	Wealth	Belief That the Outcome Affects "Me"	Voter Turnout
Individual	Education	Knowledge of Historical Examples of Alternative Political Systems	Support for Democracy
State	Natural Resource Wealth		Level of Civil Conflict
State	Executive Structure		Party System

ASSESSMENT

This study relied on a post–pre-survey as its principal tool to assess how students perceived the impact of the active-learning activities on their knowledge and skills. The survey asked students to "rate themselves twice on intended [learning] outcomes: first, the level [of skill or knowledge] they had before the course and, second, after completing it. They do so on one form *after* the learning experience has concluded" (Kanevsky 2016, 1, emphasis added). The difference between the average pre- and post-retrospective self-assessment scores reflects the subjects' perceived impact of the intervention on their learning. The post–pre-design mitigates a significant drawback of the traditional before-and-after survey: by the end of instruction, "students' measuring stick can change as they have developed greater knowledge…thus, the post-test scores often end up being lower than the pre-test scores, even though positive change has occurred" (Hiebert et al. 2011, 9). In other words, students are more aware of what they *do not* know after the course and report that their knowledge has declined since their pre-course self-assessment. The post–pre-method addresses this problem by asking students to use their current skill level or depth of knowledge as a reference point to assess where they were *before* the instructional intervention.

A single survey was administered after the completion of the semester in two iterations of the course, asking students to reflect on 10 learning objectives.[4] I chose not to collect data after each class because an activity later in the course helps students to build on and refine the competence introduced in a previous activity. For example, the exercise on concepts and measures (see the online appendix) helps students to evaluate whether an argument positing a causal relationship between two (or more) concepts is based on sound logic and evidence. In short, I designed the activities to be complementary. Therefore, evaluating student perceptions of their gains on all active-learning objectives after the conclusion of the course makes more sense. On a 5-point scale ranging from "strongly disagree" to "strongly agree," survey responses to 10 questions were rescaled to values between -1 and 1, with 1 corresponding with "strongly agree" (see the online appendix). Table 2 shows the means and t-statistics for paired sample t-tests for each survey question.

The results suggest that, on average, student perceptions of their research capabilities increased during the semester. The

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Table 2

Student Confidence Levels—Pre-Test and Post-Test (N=79)

Item	Pre-Test Mean	Post-Test Mean	Difference of Means	T-Test for Difference of Means
I can identify the core research question in a political science paper and understand its broader relevance.	0.20	0.53	0.33	t=5.73*
I understand what makes a good research question in political science.	0.07	0.54	0.47	t=7.88*
I can produce my own empirical research question on a topic of interest.	–0.05	0.42	0.47	t=8.28*
I can easily identify the main concepts in a political science research paper I have read.	0.16	0.51	0.35	t=6.79*
I can define a concept and suitable measures for my research papers in the future.	–0.31	0.34	0.65	t=10.99*
I can evaluate whether a scholar has presented a causal argument or one based only on correlation.	–0.26	0.31	0.57	t=8.45*
I can explain the causal argument of a paper verbally.	–0.24	0.38	0.62	t=9.95*
I can explain the causal argument of a paper in writing.	–0.24	0.30	0.55	t=8.76*
I can identify the basic menu of research-design options (e.g., large-N statistical versus small-N case study) and explain the benefits and tradeoffs of each.	–0.39	0.5	0.89	t=11.54*
I understand why using an appropriate case-selection strategy for a research question can improve internal and/or external validity.	–0.31	0.58	0.88	t=11.59*

Note: *p<0.01.

mean pre-score on most questions was less than zero, which indicates that students generally disagreed that they possessed various skills (e.g., "I can come up with a research question") *before* taking the course. In contrast, the mean post-score on many questions approached 1, indicating that students agreed or strongly agreed that they gained competence during the semester. The difference of means was positive and significant at the p<0.01 level for all questions.

The post–pre-surveys suggest that students perceive that their knowledge and skills improved during the semester but they cannot offer any perspective on *why* they perceived active-learning gains. Student responses to the two open-ended questions provide tentative answers to this question.[5]

Responding to the first open-ended question, students identified that the activities provided an opportunity to apply newly learned methodological concepts. Most students remarked that the activities deepened their understanding of the course topics by obliging them to apply newly learned knowledge to a research problem. For example, one student stated, "The activities gave me a better understanding of the course because they allowed me to review the material, apply my knowledge, and revise if I was off base or incorrect." Students also noted that the activities provide the context for peer discussion on the topics, which promotes learning from one another. Learning a methodological concept and building confidence in their ability to apply that knowledge takes additional engagement beyond the lecture and associated reading. One student stated it this way: "The activities allowed us to work with our peers and share our ideas and give feedback to each other." In addition, students noted that the activities gave real-world meaning to abstract methodological concepts. Because there is a wealth of content that instructors want to cover in their courses, too little time is spent discussing how the material relates to substantive questions that students can relate to their values and lives. Several comments were similar to this one: "The activities helped me apply the skills learned in the lecture to real-world examples."

Responses to the second open-ended question highlighted that students believe the lectures, assignments, and active-learning activities worked synergistically to enhance their learning. A potential implication of these comments is that pedagogical tools such as active learning are not necessarily cure-all solutions for learning deficits. Instructors should consider the course content, course level (e.g., first versus fourth year), and institutional culture—among other factors—when searching for the right combination of teaching strategies. For example, one student noted that "the activities and lectures were all beneficial in making the topics accessible and relevant…by the end of the course, I felt much better about reading political science articles." Another student stated, "The lecture provided examples and explanations for the methods, whereas the activities provided an opportunity to apply those skills." In other words, according to the students, active learning is a complement—not a substitute—for traditional teaching methods.

Many instructors know that active learning is a proven method to enhance student learning, enthusiasm, and satisfaction—a conventional wisdom supported by the evidence in this study—but they face professional obstacles (e.g., time constraints) that prevent them from implementing it in their classroom.

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CONCLUSIONS

Since implementing active-learning exercises, I have observed a marked improvement in the quality of student work and the enthusiasm they express for POL 200. Moreover, anecdotal reporting from colleagues who teach upper-division courses and the honors-thesis seminar suggests that political science majors are arriving in these courses better prepared to read and conduct original research. Many instructors know that active learning is a proven method to enhance student learning, enthusiasm, and satisfaction—a conventional wisdom supported by the evidence in this study—but they face professional obstacles (e.g., time constraints) that prevent them from implementing it in their classroom. The resources in this article will help instructors to overcome these barriers and apply active learning to their methods course.[6]

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SUPPLEMENTARY MATERIAL

To view supplementary material for this article, please visit http://doi.org/10.1017/S1049096523000574.

DATA AVAILABILITY STATEMENT

Research documentation and data that support the findings of this study are openly available at the *PS: Political Science & Politics* Harvard Dataverse at https://doi.org/10.7910/DVN/JVAWMo.

CONFLICTS OF INTEREST

The author declares that there are no ethical issues or conflicts of interest in this research. ■

NOTES

1. The TAs led the activities for both semesters examined in this study.
2. See the online appendix, table A.2, for the active-learning evaluation rubric.
3. This was a comment from a student following a brief conversation about this exercise.
4. Data were collected for the Fall 2018 (September–December) and Fall 2019 (September–December) offerings of POL 200.
5. "Did the activities help you understand the material's relevance to political science research? If so, how?" and "Which component of the course (e.g., lectures, assignments, and activities) do you think was most useful for making the material applicable to your future courses? Why?"
6. Although the specific exercises are likely to be less applicable for instructors who bring critical and postmodern approaches to their research methods course, the pedagogical strategy of connecting collaborative active-learning practices to lecture topics may be helpful.

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