Research for All: Creating Opportunities for Undergraduate Research Experiences Across the Curriculum

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Abstract: To develop our students' analytical capabilities and prepare them for the demands of the job market of the 21st century, it is imperative that Political Science faculty incorporate research and data literacy skills into a broader array of courses. Previous work on developing these skills has focused on introductory methods courses and capstone experiences, but this article suggests a scaffolded approach to incorporating accessible research experiences across the curriculum. The project provides a blue-print for the creating applied research courses and infusing existing courses with content and assignments that facilitate students' understanding of the research process and the use of analytic tools.

Keywords: pedagogy, undergraduate research, curriculum design

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Introduction

The Wahlke Report (1991) encouraged those in the discipline of Political Science to teach our undergraduates about the research process, helping them acquire the "knowledge and skills necessary to read and comprehend contemporary political analyses and develop their analytic capacity." Some Political Science departments have responded to this call by requiring courses in research design or methodology (see Turner and Thies 2009). Unfortunately, this approach may create an impression among students that once that 'research course' box is checked, they no longer need to engage with questions of "how we know what we know." Other departments of Political Science have made concerted efforts to facilitate greater quantitative data literacy, some going so far as to offer separate majors or concentrations in data analytics. These may well serve a particular population of students that take are willing and/or able to take advantage of them, but what about those that may not wish to have data science as their educational focus or those that are not at research-intensive universities where these types of majors are most likely to be offered?

If we want students from a variety of institutions and backgrounds to take advantage of opportunities for undergraduate research and prepare them for future careers that increasingly require an understanding of research processes, we would serve them better by making research and data literacy a part of a broader array of courses and creating explicit pathways for them to gain additional experience with the scientific method.

The solution offered here is to make research activities a more integral part of Political Science curricula. Undergraduate research experiences are a High-Impact Practice (Kuh 2008), and are associated with a variety of positive student outcomes, including improving retention and

graduation rates, reinforcing skill development, and increasing students' senses of self-efficacy (e.g. Ishiyama 2002). This article provides a blue-print for integrating a scaffolded set of courses and applied research experiences within the Political Science major. Faculty are encouraged to add assignments emphasizing research and data literacy in existing courses, add project-based courses to their course offerings, and create a sequence of courses that prepares students to move from consumers to producers of research over the course of their college career.

Research Experiences Across the Curriculum

The conversation in the Political Science pedagogy literature around research methods and the curriculum has largely focused on the introductory course—when students should take it (Bergbower 2017) or what methods should be taught in what sequence (Bernstein and Allen 2013; Fisher and Justwan 2018). While these conversations are important, this article takes a maximalist view as a starting point: What are all the ways in which methods can be integrated into the curriculum?

Siver, Greenfest, and Haeg (2016) create a heuristic that is useful for this conversation. The authors derive three categories for courses that denote their level of focus on methodological skills: technique-, design-, and content-focused. Content-focused courses are those where the substantive topic is of primary importance and methodology is not a matter of explicit concern. Design-focused courses put emphasis on research design, encouraging students to think about theory, identify and define concepts, and evaluate options for how one might pursue a research project on a particular topic. Technique-focused courses are those that the most applied, where students design a project, and collect and analyze quantitative and/or qualitative data.

While Siver, Greenfast, and Haeg's categorization is mean to be descriptive, we may also use it for prescriptive purposes. If these are the basic approaches to courses that engage with empirical political science, how might we design a curriculum to achieve our program learning outcomes? The answer offered here is threefold: we should try to move away from exclusively content-focused courses; the level of engagement with the research process should increase with the level of the course; all students should take at least three technique-focused courses (introductory, upper-division, capstone).

The Solution in Practice

To begin, it may be useful for departments to categorize their course offerings according to Siver, Greenfast, and Haeg's typology. Doing so serves several purposes:

1) giving an overview of the average student's exposure to methodological topics;
2) generating discussions amongst faculty regarding where they could integrate research literacy topics and activities into their existing courses;
3) creating or revamping curriculum requirements, such as a requiring a 'research-intensive' course.

The following sections focus on 2 and 3, giving ideas of how faculty might move from content- to design- or technique-focused courses and how those courses might be sequenced to facilitate student learning and development of research literacy.

First-Year Seminars

Many universities require that first-year students enroll in a small seminar-style class that is meant to introduce them to their proposed major and acclimate them to college life and a new set of academic expectations. Developing research and information literacy are frequently explicit goals of these types of courses. Because of their small size, first-year seminars are excellent opportunity for guiding students through their first research experience. A technique-focused course that offers a lot of structure—having all students in the course pursue the same pre-selected research question, hands-on activities that provide ample opportunities to practice new research skills—can serve as a foundation for work students will do later in the major.

If that seems overwhelming, there are other smaller ways to move these courses away from being content-focused. Faculty could work with students to develop their basic information literacy skills, giving them the tools to contextualize information and evaluate sources (Harden and Harden 2019). Faculty might also encourage greater research literacy by teaching students how to read an academic article. Teaching students the purpose of academic articles, the commonalities in their structure, and what to prioritize in their readings can help them overcome anxiety associated with reading journal articles, improve their understanding of important topics, and increase the efficiency of their study time. Leanne Powner's (2014) *Empirical Research and Writing in Political Science* is an especially useful resource for demystifying academic research.

Introductory Courses

As mentioned previously, it is increasingly common that students in Political Science majors take at least one research methods course, usually at the introductory level. The introductory methods course is a natural opportunity to provide technique-based instruction. However, I

would argue that discussions of methodology should be a part of *all* introductory classes, not just the one that is explicitly titled “Research Methods." Introductory courses are more likely to be content-focused, but creating a structure wherein faculty teaching these courses are expected to include lectures and assignments that engage with research design and methodology may help students learn material more effectively, while also giving them the tools that they need for future courses that are more design- or technique-focused.

There are few examples in the current Political Science literature of how one might go about adding research design and methods to introductory courses; Dickovick (2009) gives examples from a Comparative Politics course. In my own introductory course in International Relations, I have integrated applied exercises related to topics of substantive interest. The primary focus of the exercises is to help students become informed consumers of both qualitative and quantitative data, but students are also expected to do some applied work as well.

For example, students are given an example of a government report on human rights and are asked to identify the evidence underlying the report and where that evidence came from. They are also asked to consider sources of potential bias. Another assignment asks students to work with a cleaned quantitative dataset of international trade flows, make a scatterplot, and interpret the results. The format of the assignment does not require previous experience manipulating data or knowledge of a statistical programming language. These low-stakes exercises facilitate research and data literacy through hands-on experience. Doing so in a substantive course reinforces the idea that research is an integral part of our field and that developing scientific knowledge is a process.

Upper-division Research Skills and Applied Data Science Courses

In addition to introductory courses, research skills can also be taught as technique-focused upper-division courses with a more in-depth approach. In my own department, that has meant adding full-year courses in Applied Research and Applied Data Science (these courses are two credits per semester, while a standard course is four credits). The Applied Research course focuses on research design and the practical process of research in the first semester and academic communication in the second. In the Applied Data Science course, students learn to use the R programming language to clean and merge data, perform basic regression analysis and visualize their results.

Adding these types of courses is likely to be facilitated by conditions at a large research-intensive institution. For many departments, they may not have the same flexibility in adding courses and may face staffing issues. Thankfully, there are other ways of giving students applied research experience.

Applied Research Experiences

One way of making research accessible to all is to integrate course-based undergraduate research experiences (CUREs) into existing upper-division courses. CUREs are generally technique-focused, designed to walk students through an entire research project over the course of a term (Hensel 2018). Students are guided through a series of scaffolded assignments ranging from exploring the literature on a topic to devising a research question to designing, completing and reporting the results of a study. Requiring all students in a major to complete at least one CURE-based upper-division course will facilitate advancement of their research skills and prepare students for a capstone experience.

Faculty that already integrate a research paper into their upper-division courses might add some

course sessions on information literacy, research design, or other topics that would facilitate completion of the paper (i.e. source credibility, reviewing the literature on a topic, making an annotated bibliography). They might also add a required quantitative component to the project, asking students to use publicly-accessible information to make figures and visualizations or perform some basic statistical analysis. For an example of a CURE in an American Politics course, see Knoll (2016); in International Relations, see Morehouse et al. (2017).

Another way to integrate applied research experiences is to create opportunities for students to serve as research assistants to department faculty, either for credit or as a co-curricular activity. Working on real research projects can be rewarding for students, empowering them to do their own research or pursue graduate education in the future. However, working with undergraduate RAs can be time-consuming for faculty. Giving faculty credit toward their teaching-load or other types of perks, such as small amounts of research funds, for this type of supervision may facilitate greater participation. With the rise in popularity of UREs in higher education, many institutions across the spectrum have some funding to support undergraduate research(ers). For ideas on how to scale these types of research experiences, see Becker (2019).

Capstone Project

Wahlke (1991) recommended that students undertake a capstone project and many universities now require some sort of senior paper or project. However, for these projects to truly be a 'capstone,' they need to be a culmination of a student's previous experiences. A recent study by Hinckley, McGuire, and Danforth (2019) suggests that students that have previously taken a research-intensive course are more successful in capstone experiences.

It is imperative that members of the faculty and department leaders pay close attention to the way

in which students are prepared for the capstone (Houck 2019). Following the curricular scaffolding suggested here will increase the likelihood that students gain the skills necessary to complete a capstone project, decrease their anxiety around independent research and improve the quality of their work.

Conclusion

Facilitating research and data literacy in higher education has become increasingly important, as we, as faculty, try to create curricula that serve the needs of our students both during their college experience and in the job market of the 21st century. In order to have the greatest impact, we need to make sure that students are exposed to research and data early and often. In this paper, faculty are encouraged to adopt practices in their courses that facilitate their students' understanding of the research process and create course sequences that allow students to develop analytic skills over time, moving them from consumers of research to producers of research. The potential additions and/or changes to curricula discussed in this paper are made with the hope that research experiences can be made accessible to all.

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