Teaching Research Methods: Learning by Doing

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“I hear and I forget. I see and I remember. I do and I understand.”
— Confucius

ABSTRACT
This paper outlines ways to structure a research-methods class so that students gain a practical knowledge of how research is done. Emphasis is placed on data collection, using statistical software, and writing up results. Included in this article are several assignments and exercises that, when combined, work to produce a scholarly empirical report. Students gain an appreciation of the fruits and frustrations involved in the research process, and learn to be more critical consumers of research projects.

INTRODUCTION
In search of a way to teach research methods, I have turned to a practical, hands-on approach that encourages students to partake in the rewards of conducting their own empirical research. This article outlines goals and objectives, and includes a list of assignments that culminate in a presentable work of original research. In this undergraduate, political science, research-methods class, students learned about the research process that is integral to all social sciences. Further, this teaching method can easily be adapted to meet the needs of students at all levels, including graduate students in public administration and public policy. This paper outlines the steps used to accomplish this task, including the disadvantages and possible corrections for those who wish to adopt the method.

GOALS
Each institution, department, and instructor stresses different goals for training in research methods. Some might emphasize the diversity of social sciences, and the types of questions asked in various sub-disciplines. Others might advocate epistemology and the need to understand the role of scientific knowledge. The goals of this course briefly cover these very important issues in the methodology
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literature. But the goal of this particular research-methods course is to communicate the research process by using a very practitioner-oriented method that includes data gathering, analysis via a statistical software package (\textit{SPSS version 13}), and learning the language of social-science research.

Many students at both undergraduate and graduate levels possess very weak foundations for conducting empirical research. Empirical research is different from most of the other “research” that many students have completed. This deficit makes it a challenging undertaking that can lead to frustration for both the instructor and the student. By following the steps and assignments offered here, an instructor can avoid many of the pitfalls associated with producing an original empirical research paper, while simultaneously teaching research-methods principles.

The instructor must find a way of conveying to students the importance of asking an appropriate social-scientific question; learning how past researchers have addressed an issue; collecting data; and learning how to interpret cryptic statistical output. What follows is a brief outline of the steps taken to administer such a course, through a series of assignments, followed by a frank evaluation of each step and some reflections on what should be done differently in order to improve future experiences.

\textbf{ASSIGNMENT 1: GENERATING THE QUESTION}

Managing the work and progress of research is the instructor’s primary concern. For students to learn by doing, I prepared broad topics prior to the beginning of the semester. These general topics in local government were meant to tap into the students’ various interests. They included the Alabama constitution, bureaucrat-lawmaker relations (principal-agent problems), intergovernmental cooperation, and citizen contacts. I provided students with citations and background readings for each topic. Students were assigned homework from a traditional research-methods text, and also completed workbook exercises (Johnson & Reynolds, 2005b; Pollock, 2003) prior to discussions of specific research questions. During a class session, students were divided into teams, and each team came up with a set of very intuitive hypotheses. The hypotheses were then followed with the question of “why?,” which directed students to the next step of writing a literature review. Below are examples of the students’ hypotheses.

\textit{State Constitutional Issues}

Hypothesis 1:
Partisan identification is connected to support for the state constitution.
Why?

Hypothesis 2:
Lawmakers who favor home rule are unhappy with their positions.
Why?
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Intergovernmental Relations
Hypothesis 3:
Lawmakers are increasingly tied to other governments and non-governmental organizations (e.g., Chamber of Commerce). Why?

Hypothesis 4:
The smaller the city, the more it needs intergovernmental cooperation. Why?

Citizen Contacts
Hypothesis 5:
Lawmakers are not concerned about citizens. Why?

Hypothesis 6:
Lawmakers will probably claim that the poor are less likely to contact them. Why?

Bureaucratic Politics
Hypothesis 7:
Lawmakers with longer service records tend to show more trust in government employees. Why?

With guidance from the professor, all of the hypotheses were generated from topics of student interest. Tailoring the research questions in this way facilitated the cumulative method of writing a research paper by encouraging the students’ “buy-in” to the process. Using student-generated hypotheses for the purpose of teaching research and reporting methods also fostered motivation, interest, and — ultimately — a deeper understanding of research results. In addition, the early partnership between professor and student in the hypothesis-generating process allowed for the type of collaboration that continues throughout the semester. The collaborative nature of the exercise also allowed certain aspects of the research to be designed specifically to meet course expectations and requirements. For example, the above-mentioned hypotheses were easily adapted to the bivariate analysis techniques presented in this particular class.

As an instructor, I want to encourage students to explore their interests, but I also need to maintain enough control for course goals to be met. In conducting this class, I sided with control over choice. Admittedly, the questions and topics were closely tied to my own research interests and areas of expertise. Not all students were thrilled by the idea of researching local governance, but I found that they enthusiastically embraced the challenge once we started a literature review and began gathering U.S. Census data for the cities that were in their research projects.
ASSIGNMENT/STEP 2: THE LITERATURE REVIEW

This step offers the instructor an opportunity to expose students to important online archives that typically are not used in other courses, but that are essential to conducting original research. Using the Internet posed new problems and new possibilities. At this point, it was helpful to discuss the benefits and dangers of Internet research. For example, use of Wikipedia — a popular online information source for many students — was discouraged, but other available resources and research methods were discussed and debated in the classroom. Exercises from the Johnson and Reynolds (2005b) workbook were assigned to give students a functional background on what constitutes a legitimate source.

Ultimately, students learned how to conduct literature reviews by using peer-reviewed articles from JSTOR (www.jstor.org) and EbscoHost (www.ebscohost.com). Most university libraries have paid subscriptions to access these databases. Students ideally should have on-campus database access, but, depending on library policy, they might have to access databases from an off-campus computer, via a log-in on the school’s Web site. Instructors should check with their school libraries to obtain off-campus computer access procedures. Instructors also should note that the most recent publications often are not available through these academic databases. There is usually a three- to five-year lag time between the journals’ actual publication dates, and the dates they become available on an academic database, called a “moving wall.”

For this portion of the paper the assignment was straightforward:

This section is the part where you discuss the works of past researchers who have examined similar questions. Be able to cite at least 5-7 sources taken from peer-reviewed works found in the JSTOR or EbscoHost archives. End this section with a paragraph that clearly states the hypotheses you plan to test, and why this relationship is important, based on the literature you just reviewed.

The number of citations and the length of the literature reviews were picked arbitrarily. One of the aims of this assignment was to familiarize students with the vast archives of available peer-reviewed journals. However, conducting the literature review this way often resulted in students overlooking books as sources. Students were advised to talk to me if they wanted to include books in their literature reviews, because I was concerned about them citing books that did not rely on empirical evidence to make their claims. Although this problem did not arise when this teaching strategy was employed, it may be a problem in future classes.

ASSIGNMENT 3: DATA GATHERING

Data gathering poses problems for social science researchers, and new
challenges for students in research-methods courses. The goal of this portion of the course was twofold: to educate students about the very large archives of available raw data and how they are entered into a statistical software package; and to create a survey instrument that in this case could be used to gauge the attitudes of local elected officials. Empirical work was the foremost priority, but I also saw an opportunity for students to become better acquainted with the community. Students explored the United States Census Web site and gathered demographic statistics for 15 cities located in our region.

Based on their original research questions, students then submitted survey questions designed to measure the relationships that they were investigating. As a class exercise, the questions were then vetted, in order to determine whether or not they properly operationalized the intended concepts. This exercise produced a questionnaire that captured the students’ various interests, and also served as an instrument to gather lawmakers’ opinions on various issues. After reviewing the chapter on “elite interviewing” (Johnson & Reynolds, 2005a, pp. 270-301), students were assigned city council members from area municipalities. To conduct interviews, they were expected to either “cold-call” locally elected officials to set up appointments, or attend a public meeting.

The surveys were administered in this manner so that class participants could get to know community leaders. In order to stay on schedule, one week was allotted for interview completion. This aspect of the class was less successful than the first part. About half of the class participants (7 of 13) were able to connect with at least one of their assigned elected officials. Six of seven completed more than two surveys.

Students who were able to establish contact provided colorful stories about their experiences. One student met with the mayor of a small town for more than two hours, because the mayor felt compelled to rationalize and explain each response. One student described how a respondent became aggravated by many of the questions. The involved councilwoman said that most of the information was “none of our business,” but that she “would tell [us] anyway.” A student who called city hall for the mayor’s and the city council’s contact information was subsequently told to reach the elected officials — who all served part-time — at their places of full-time employment. She met with at least two council-members while they worked — one at the local grocery store — and conducted interviews during their breaks. Finally, and most alarmingly, a student who showed up to a biweekly council meeting found that council-members had relocated to a more “private” conference room to conduct the meeting. This practice alarmed many in the class because it violated the spirit of the government’s open-meetings act. The student eventually was able to find the meeting room and was allowed inside, but claimed that she did not feel welcome. She was allowed to distribute the questionnaire to the council-members, and followed up by leaving them voicemail messages asking whether or not they had completed the forms. It was
no surprise that none of this city’s lawmakers participated.

Data gathering is a very important and exciting component of the “learning
by doing” teaching method. By completing workbook exercises in this section,
students learned about the data resources available from the U.S. Census
Web site; how to input raw data into SPSS; how to operationalize abstract
concepts from the social sciences; and how to construct and conduct a survey.
I had reservations about the portion of the survey where students conducted
interviews. My first concern was with the institutional review process. The
institutional review board (IRB) is a committee that seeks to ensure the safety of
all research participants, and the IRB process often varies from school to school.
Some institutions say that elite interviews do not need IRB oversight, while
others might require that the institution’s IRB chair sign off on the project. One
needs to pay special attention to a university’s IRB policies on elite interviewing,
“but the proper course of action is to contact your institution’s research office
for information regarding the review policy on human subjects” (Johnson &

My second concern was that students had limited success in completing the
assignment. Even though half of the students (6) were either unable to gain
access to lawmakers, or were “stood up” by those who made appointments,
the exercise was still very rewarding for those who achieved access. Since the
conclusion of the class, I have debated about whether or not students should
conduct their fieldwork independently, and I am considering using one of many
online survey applications to bypass this problem in the future.

Nonetheless, students found their fieldwork to be the most exciting part of
the semester-long project. They learned about the data-gathering process and
saw that it can be somewhat messy, because researchers are constantly wrestling
with less-than-ideal situations. They also learned about the challenges of
operationalization, and of finding ways to measure the abstract concepts that
interested them. The obstacles they encountered taught them that this was a
difficult step of the process — one where researchers are often forced to make
compromises due to lack of accessibility, time constraints, and limited resources.

Assignment 4: Data Analysis

Data analysis was conducted over the course of two assignments. The first
assignment required students to enter and analyze the Census data they had
obtained earlier in the semester. Analyzing the data gave students the ability
to apply many of the skills that they learned from the workbook (Johnson
& Reynolds, 2005b; Pollock, 2003). For example, they generated measures
of central tendency and variance for cities in the sample by using SPSS. The
assignment also required students to prove their proficiency in performing
some fundamental tasks within SPSS. They demonstrated that they knew
how to read the SPSS output, and how to convert new information into a
narrative that could become part of their required, end-of-semester paper. The assignment read as follows:

Provide a narrative of the univariate analysis of the cities we have selected. You should use the “cities” dataset we compiled to generate some of the descriptive statistics that will be needed in your narrative. Here are some of the questions your narrative should address:

1. Where are your cities located?
2. Why were those cities chosen?
3. What [are] the cities’ average population[s] (be sure to report the mean, standard deviation, and the median). If there is a large difference between the mean and the median be sure and explain that difference.
4. What other variables matter (e.g., income, race, education, per-capita income, etc.)? Why are those variables significant to your study?
5. Report mean, standard deviation, and/or the median for the variables you discussed.

The second step analyzed the bivariate relationship of interests and required that students write a narrative to describe the SPSS output and its implications. By this time in the semester, students were able to manipulate variables, and they were making new variables by either computing or recoding original variables in the data set. They were required to report measures of central tendency and variance in the dependent and independent variables that were applicable to their research. The assignment read as follows:

Start this section by discussing the variables independently from each other. What is their distribution (mean, median, mode) and standard deviation (if applicable)? Next, discuss the type of statistical analysis you are conducting. Is it a measure of central tendency and variance (standard deviation)? Does it use cross-tabs? Discuss each procedure and your results (percentages, differences, and whether or not your hypotheses are confirmed). Be sure to convert the cryptic SPSS output to a more presentable WORD file that is embedded into your document.

This proved to be an exciting step, as students started calculating new variables and finding support for their hypotheses or, in most cases, failing to reject a null hypothesis. Much discussion arose over the value of “confirming” the null hypothesis, as students questioned whether or not value was derived from the “non-finding.” After all, it is not easy to get excited about a null hypothesis. As the instructor, I stressed that understanding how the world operates is part of the scientific discovery process, and that even finding support for a null hypothesis is an important step in that direction.
In addition to familiarizing students with measures of central tendency and variance (standard deviation), the second data-analysis assignment aimed to have students demonstrate that they understood measures of association (e.g., Chi-square) and measurements of strength and direction (e.g., Lambda, Cramer’s V, and Gamma). To do more than simply report the output, students were urged to view this exercise as a “telling of the story” that the SPSS output represented (Majone, 1989; Stone, 2002). Students also were encouraged to convert the SPSS output into a more presentable written format that could be inserted into the document.

**ASSIGNMENT 5: PUTTING IT ALL TOGETHER**

Up to this point, students were turning in independent assignments that all seemed to be related, i.e., the literature review was related to the data analysis, but had not been compiled as a cohesive research document. The goal was that each assignment would serve as a component of the final research paper. As a class, we reviewed *Structuring Your Papers*, by Barry Weingast (1995), and discussed how to properly write an introduction to the work. This assignment read as follows:

**Introduction**

*Why is this topic relevant?* To make results that are more than just “interesting,” your specific subject also needs to be relevant to the broader discussion of political science. Explain why this topic deserves investigation. End this section with a separate paragraph, called the “road map” paragraph, to “guide” the reader. For example: “This paper proceeds as follows. In section one …” (For further details, see http://www.stanford.edu/~weingast/caltech_rules.html).

At this point, we also discussed how to end the papers by writing conclusions:

**Conclusion**

*What would you have done differently if you had the resources to gather your own data?* Discuss the limitations of your research. Reflect on what your findings mean with respect to the broader literature on that topic.

I asked students to speculate on other factors that were not included in their models. I also encouraged them to go ahead and provide social commentary in this portion of the paper, so that they could reflect on what their work is telling us about how the world operates.

**CONCLUSION**

The format of “learning by doing” was very rewarding for the students. This process used a hands-on approach to learning empirical research methods.
Students got their hands dirty, both students and the instructor became frustrated, and students learned about the constraints that bind the research process. Understanding empiricism and the systematic analysis of data was an important lesson conveyed to the students in this class, because they saw how this step creates the basis of good social-science research. Students found that the research process allows for some creativity by the researcher, and that there is a clear line between being creative and being dishonest. They learned that the research process puts a premium on transparency and transmissibility, meaning that readers of research reports should be able to duplicate the findings.

The assigned steps that students followed required them to develop original research questions; to collect and analyze data; and to draw some sort of conclusion from the empirical evidence. The approach offered in this article is one classroom-based option, with many possible variations. For example, in a qualitative-methods course, one might consider doing case studies with a shared theme. In this case, the instructor might suggest that the class concentrate on unfunded mandates, with each student focusing on a different mandate (e.g., Americans with Disabilities, county inmate healthcare) and its effect on local governance.5

A course that stresses the “hands-on” approach should teach students how research is conducted, but it also should require them to do the research, as a way of communicating the importance of empiricism in the social sciences. Both instructors and students can benefit from this teaching strategy. It gives the instructor an opportunity to integrate research with teaching, and to inject students directly into an active research agenda. Professors are able to share with students their experiences of trying to research a particular area. In this case, students appreciated the frank discussions regarding the difficulties, rewards, and opportunities that they discovered while researching local government.

Finally, the practitioner-oriented aspect is particularly well-suited to graduate students in either public administration or public policy. Their newfound skills can immediately be put to use in various public-sector careers, where data analysis is an important element of assessment. While the class was offered to a general audience, most of the participating students had political science majors or minors, and the topics were broad enough to get other students interested in the content. The most important goal of the class was for students to learn about the empirical research process in a pragmatic, “hands-on” environment.

This approach was rewarding for both instructor and students, because the learning method was based on a combination of active “hands-on” participation and text-based examples. Integrating mundane scientific processes into an action-oriented course application offered students an interesting alternative that enhanced their desire and abilities to learn the material.
REFERENCES


FOOTNOTES

1 I put works by Bledsoe (1993), Fenno (1997), and Stone (1989) on reserve at the library. These pieces served as background material that enabled students to get acquainted with research projects.

2 See http://www.jstor.org/page/info/about/archives/journals/movingWall.jsp for JSTOR’s “moving wall” policy.

3 The Web site http://factfinder.census.gov/ was used as a source of primary data.

4 A copy of the survey is available at http://www2.una.edu/naaguado/survey.htm.

5 Professor Suzanne Leland suggested this variation, which she used successfully in an intergovernmental relations class.

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