

**A Bachelor's Degree in Political Science:
Are we training Researchers, Analysts, or Both?**

Josh Franco
jfranco@ucmerced.edu
Political Science
University of California, Merced
5200 North Lake Road
Merced, CA 95343

Prepared for presentation at the Annual Meeting of the Western Political Science Association, San Francisco, California, March 29-31, 2018. I appreciate the pedagogical training provided by Anali Makoui, Adriana Signorini, and James Zimmerman, the geographic information systems training offered by Erin Mutch, and the participation of my students enrolled in my fall 2017 California Politics course. I thank Nathan K. Mitchell for constructive feedback. And I appreciate the feedback from attendees of UC Merced Political Science Program's inaugural Working Paper Seminar Series Workshop.

Abstract

Political scientists, for years, have debated what undergraduate curriculum should include (Craig, 2018; Haines, 1915; Ishiyama, Breuning, & Lopez, 2006; Laves, 1940; Wahlke, 1991). Thus far, the century's long debate has centered on the organization of a baccalaureate, instead of curriculum at the course-level. Given the costs of reorganizing degrees, how can we merge the science of politics and the practice of politics in a single course? In a 16-week, upper division course on California Politics, I address the need to develop students' social scientific skills and practical skills through Journal Article Analysis (JAA) teams and Public Policy Project (PPP) teams. I use a within-subjects, pre-test post-test, research design and survey student's scientific and analyst abilities before and after the course. I find that students demonstrate marked improvement in both skill sets.

Introduction

For those of us years removed from our undergraduate days, a bachelor's degree may feel mere. But, a bachelor's degree, in it of itself, represents a significant accomplishment for students. Whether they started at a 2-year community college and transferred (Piland, 1995), went directly to a 4-year institution after graduating high school, or were enrolled on and off over the years before completing their studies (Taniguchi & Kaufman, 2005), the degree is recognized as a feat worthy of the pomp and circumstance. In addition to serving as a symbol of achievement, a degree constitutes the completion of a purposefully designed curriculum by the faculty at their college or university.

Today, over 1,100 four-year colleges and universities in the United States offer a bachelor's degree in political science¹. In California alone, 72 four-year institutions offer the degree². Since 1950, the number of degrees awarded annually has increased from 6,336 in 1950 to 37,361 in 2014. During this sixty-four-year period, approximately 1.5 million undergraduate political science degrees were awarded³. Furthermore, according to the National Science Foundation, in 2008, approximately 50,000 Bachelor's, 20,000 Master's, and 1,000 Doctorate degrees were awarded in the discipline⁴. This demonstrates that most students who earn an undergraduate degree in Political Science never go on to earn a Doctorate in the field⁵.

¹ I completed a search on College Navigator with the follow criteria: states: no preference; programs/majors: American Government and Politics, Political Science and Government General, and Political Science and Government Other; level of award: Bachelor's; institution type: 4-year. This yielded 500+ results (<https://nces.ed.gov/collegenavigator/?s=all&p=45.1002+45.1001+45.1099&l=93&ic=1>). I added an additional criterion using the "Use Map" feature to search by region. This yielded eight exportable tables. After combining tables, there are 1116 college and universities that meet the original criteria.

² College Navigator: <https://nces.ed.gov/collegenavigator/?s=CA&p=45.1002+45.1001+45.1099&l=93&ic=1>

³ U.S. Department of Education, National Center for Education Statistics: https://nces.ed.gov/programs/digest/d15/tables/dt15_325.92.asp, Bachelor's degrees in "political science and government"

⁴ "Data on the Profession", American Political Science Association, <http://www.apsanet.org/RESOURCES/Data-on-the-Profession>

⁵ Data is not readily available to show the number of non-political science undergraduate majors who pursue an advanced degree in the discipline, or vice versa.

Given this fact, how does political science curriculum prepare students to pursue graduate studies or enter the workforce? Specifically, are students earning a bachelor's degree in political science to train as future researchers, applied analysts, or both? I believe the answer can be "both" because students should be able to use the scientific method to understand politics and apply their theoretical knowledge to practical (Craig, 2010), real-world challenges (Isacoff, 2014). In other words, students should be prepared to confidently pursue an advanced degree or enter the workforce with their political science bachelor's degree in hand.

Political scientists, for years, have debated what undergraduate curriculum should include (Craig, 2018; Haines, 1915; Ishiyama et al., 2006; Laves, 1940; McClellan, 2015; Wahlke, 1991). Ishiyama et al. (2006, p. 664) wrote: "In an era of declining enrollments and heightened competition for students, it is incumbent upon political scientists as educators to provide a rationale for students to take the courses we offer, *to explain how the political science curriculum can help equip them for the challenges of their careers and/or post baccalaureate education* [emphasis added], and to clarify why we organize the curriculum the way we do." Thus far, the century's long debate has centered on the organization of a baccalaureate: What knowledge and skills should students acquire? What courses should students take? What sequence should the courses be taken in? What should be the culminating experience for graduating seniors, if one at all? However, curriculum is more than the organization of courses which constitute the major⁶, but the contents of courses themselves.

Preparing future researchers and future analysts means merging the science of politics and the practice of politics into the training of undergraduate students. As mentioned earlier, there is a robust debate about curriculum at the degree level. The attempt at bridging science and

⁶ I use the terms major, degree, and program interchangeably to represent a four-year undergraduate baccalaureate.

practice is done by having lower-division courses in the various sub-fields such as domestic politics, comparative politics, international relations, and political philosophy, a research methods sequence (Bergbower, 2017), upper-division courses that explore topics in depth, and an internship, service learning, or capstone experience (Hummer, 2014). Therefore, over the course of a four-year program, students may be well trained in the science, but have seemingly less opportunity in the practice, of politics.

A shift from program-level curriculum to course-level curriculum is needed to move the proverbial debate about teaching and learning political science forward. There are two reasons to shift the conversation. The first reason is that revamping a major's curriculum encounters a collective action problem between faculty of various minds, ranks, and incentives. Barring alignment of celestial objects, reorganizing a major curriculum faces significant obstacles, unless starting from scratch (Hansford & Nicholson, 2008). The second reason is that past recommendations for how undergraduate political science curriculum should be organized have been sparsely adopted (Ishiyama et al., 2006). The lack of adoption may stem from the generalness of the recommendations to the diversity of institutions who find the applicability limited in their institutional setting. Both reasons represent the cost of change, and there appears to be little appetite to absorb such costs.

While the cost of change may be exorbitant at the degree-level, it is less at the course-level. At the course-level, faculty determine what they teach and how they want to teach their courses. This means the cost is incurred at the individual, as opposed to group, level. This shift in scope removes the collective action problem and negates the adoption of degree-level recommendations. Essentially, instead of thinking about the structure of a 4-year undergraduate

program, we focus on what is happening in the courses that serve as the building blocks of the degree itself.

If, as Ishiyama et al. (2006) suggests, we need to do a better job “[explaining] how the political science curriculum can help equip [students] for the challenges of their careers and/or post baccalaureate education”, then we need to think of curriculum at the course-level, instead of the major-level. With this shift complete, the specific question I seek to answer is: would it be too ambitious to try and merge science and practice in a single 16-week, upper division political science course? To answer this question, I use a within-subjects, pre-test post-test, research design (Trochim & Donnelly, 2005). I survey student’s skills and abilities at the beginning and end of the course to measure what growth they experienced in achieving social scientific literacy and applied analyst skill development.⁷

Teaching: What and How?

The point of the preceding discussion was to shift our thinking from how a student goes through a 4-year curriculum sequence of courses, to focusing on what and how individual courses are taught. Thus, the first question to consider is: What do political science professors teach? It is clear that ‘what’ professors teach is a curriculum (Egan, 1978). I define curriculum as the course objectives, content, activities, and assessments that a syllabus typically outlines. The instructor principally crafts the curriculum. However, the assessment of student learning continues to become more prominent (Deardorff & Folger, 2005; Young, Cartwright, & Rudy, 2014). Assessment’s increasing prominence means designated course learning outcomes,

⁷ A drawback of the within-subjects design is that the subject may feel the need to demonstrate an increase in knowledge in the post-test survey, even though that may not be the case. One way I will address this concern is to examine students’ responses to final exam questions. Questions can be categorized as either “researcher” or “analyst” questions. For example, a student who rated themselves 2 in the pre-test and 4 in the post-test on “researcher” questions should be more likely to score higher on “researcher” final exam questions than a student who rated themselves 2 in the pre-test and 3 in the post-test.

department learning outcomes, university learning outcomes, disciplinary norms, and accrediting institutions are further influencing course curriculum. For example, the WASC Senior College and University Commission writes: “The five core competencies – writing, oral communication, quantitative reasoning, critical thinking, and information literacy – are critical higher-order intellectual skills for students to develop in order to be successful at school, at work, and in their private and civic lives.”⁸ Universities, campuses, departments, and their faculties are responsible for translating the “Big Five” into actionable statements which professors translate to students in the classroom.

With course curriculum conceptualized, the second question is how do political science professors teach? ‘How’ professors teach is dependent on their personal strengths and weaknesses, graduate coursework, pedagogical training, and real-world experience (Hartlaub & Lancaster, 2008). Like curriculum, there is no one-size-fits-all approach to teaching. However, some norms have developed over time within the discipline. The most common norm is professors lecturing to students (Edwards, Smith, & Webb, 2012; Hartley & Cameron, 1967). Lecturing can be viewed as a unidirectional approach where the expert disseminates knowledge to pupils. Another norm that has rooted itself in the discipline is professor-led question and answer sessions (Brickhouse & Smith, 2009). This is a bidirectional approach where the expert quizzes pupils about the subject at hand, which is also known as the Socratic method (Szypszak, 2015). This is arguably a more engaging approach to teaching than simply lecturing. Finally, an emerging norm is peer-to-peer learning (Crouch & Mazur, 2001). Peer-to-peer learning is a multidirectional approach where the expert facilitates the dissemination of knowledge among

⁸ “The Big Five: Addressing Core Competencies”, WASC Senior College and University Commission, <https://www.wscuc.org/content/big-five-addressing-core-competencies>

pupils and the pupils teach and learn from each other. Thus, we have three concepts of how professors teach.

Designing a Political Science Course for the First Time at a University

The University of California, Merced opened in 2005 and is the 10th campus in the University of California system. By 2016, the campus ranked as an “R2” in the Carnegie Classification of Institutions of Higher Education⁹. As a Ph.D. candidate at UC Merced, I can teach as an Instructor of Record. I was selected by the political science faculty to offer California Politics for the first time in summer 2017 during a 6-week session. I followed this with a 16-week semester-long version during fall 2017. The course details and data used in this paper are from fall 2017. Next, I outline the five steps I took to design the course.

My first step in crafting course curriculum was to read the university catalog’s entry for the course. The catalog course description is: “Examines issues and challenges confronting the State of California; uses California as a window into state politics in general.” I interpreted this description to mean that I could leverage “issues and challenges” specific to California and contextualized them to other states. For example, an issue facing California are natural disasters, such as earthquakes and fires. While these types of natural disasters may be of little concern in the southeastern United States, other natural disasters, like hurricanes and tornados are. Thus, we can compare how different states respond to different natural disasters. Beside the course catalog entry and sample syllabus¹⁰, I was given complete autonomy to develop the course.

⁹ “Campus Named to Carnegie List of Research Universities”, UC Merced, <http://www.ucmerced.edu/news/2016/campus-named-carnegie-list-research-universities>

¹⁰ “POLI 107: California Politics”, UC Merced CRF Management System, <https://eng.ucmerced.edu/crf/ssha/poli-107-california-politics>

My second step to creating the curriculum was to determine which classroom I would teach in. With course enrollment capped at 45 students, I opted to use our university's Technology Enabled Active Learning¹¹ (TEAL) classroom. The TEAL classroom consists of ten stations each with nine chairs, a dedicated monitor and whiteboard. What makes this space unique is that it physically organizes students into groups, allowing students to work in groups efficiently. For example, the room has four large projector screens where I display my lecture slides. During lecture, I have a set of questions for groups to answer. I can beam my display to the ten stations and give groups time to discuss their answers. Thus, the physical space allowed for a natural ebb and flow between a unidirectional approach of lecturing and a bidirectional approach of me calling on students during lecture, to a multidirectional approach where students interacted and learned from one another. In other words, it allows students to get active during a large lecture (Huerta, 2007).

The third step in developing the curriculum was to review the UC Merced Undergraduate Political Science program learning outcomes (PLOs)¹². There are five PLOs to be achieved by students earning a Bachelor's of Arts in political science. Course learning outcomes (CLOs) are outcomes to be achieved by students enrolled in a specific course. I developed the following CLOs that link to one or more PLOs: 1) analyzing journal articles; 2) teamwork; 3) conducting public policy research; and 4) public speaking. Figure 1 shows the relationship between CLOs and PLOs.

¹¹ UC Merced's Technology Enabled Active Learning Classroom, <https://it.ucmerced.edu/the-teal-room/>

¹² "Undergraduate Learning Outcomes", UC Merced Political Science, <http://polisci.ucmerced.edu/undergraduate-learning-outcomes>. The full text of the five PLOs are: 1) Understand the processes, theories, and empirical regularities of political institutions and political behavior in the student's chosen emphasis area: American politics, comparative politics, or international relations. 2) Employ critical thinking and demonstrate social scientific literacy, including basic quantitative literacy. 3) contemporary social science research methods to conduct rigorous research on political phenomena. 4) Write effectively, particularly to convey complex concepts and information in a concise manner. 5) Apply abstract theory and research methods to understand contemporary political events and public policies.

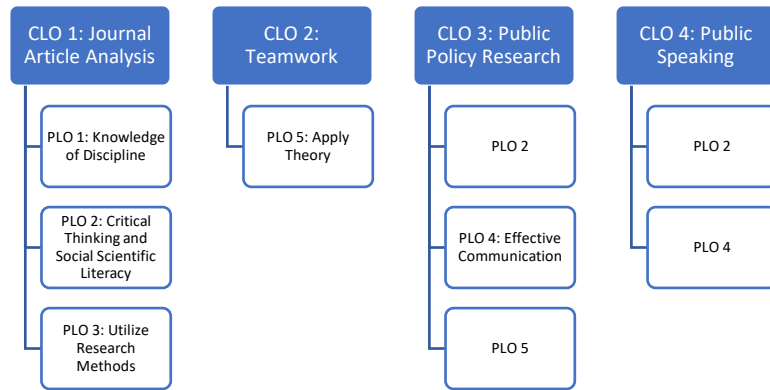


Figure 1: Course Learning Outcomes' relationship with Program Learning Outcomes

The fourth step was to segment the curriculum into learning units (LUs). An LU is a self-contained unit that includes learning objectives, content, and assessments for a specific topic which ranges from 30 minutes to 60 minutes of in-class time. Appendix 1 lists the course's 24 LU titles and learning objectives. "A statement of a learning objective contains a verb (an action) and an object (usually a noun)"¹³ which is based on the revised Bloom's Taxonomy (Anderson et al., 2001; Bloom, 1956; see also Mitchell & Manzo, 2018). Each LU has 2-4 learning objectives associated with it. Learning content includes text, pictures, videos, and sounds. For example, text ranges from bullet pointed statements on slides to peer-reviewed journal articles, while pictures could be maps showing the prevalence of natural disasters, such as earthquakes or hurricanes. Finally, learning assessments for each LU contains a five to ten question quiz that was available during the week lecture was scheduled.

The fifth step was to develop assignments for the course. Assignments fall into four categories which are worth a percentage of the students' overall course grade: class attendance (20%); journal article analysis teams (25%); public policy project teams (25%); and final exam (30%). Assignments are a focal point for students because they are used to evaluate performance

¹³ "Revised Bloom's Taxonomy" <http://www.celt.iastate.edu/teaching/effective-teaching-practices/revised-blooms-taxonomy>

and determine an overall grade for the course. Additionally, assignments can be considered the “learning activities” where students utilize knowledge and skills acquired in LUs to complete the activity at hand.

Class Attendance (Tiruneh, 2007) measures presence in the twenty-four periods: fourteen lecture days and ten group work days. Journal article analysis teams consist of six assignments: four presentations and two oral presentations. Public policy project teams consist of six assignments: four reflections and replies, one oral presentation, and one post-presentation reflection. Both teams were a form of collaborative learning (Wolfe, 2012) and interactive learning (Damron & Mott, 2005) since students worked in small groups in and out of the classroom to discuss and complete assignments together. The final exam consists of three parts: a journal article analysis annotation, a small group seminar with the professor, and a one-hundred question exam proctored in person but completed via the course’s online learning management system¹⁴.

Each student was randomly assigned to a “science” team and an “analyst” team. The science team, called Journal Article Analysis team, met to analyze four peer-reviewed journal articles and orally present two articles throughout the semester. The analyst team, called the Public Policy (Wukich & Siciliano, 2014) Project team, chose a public problem and members serve as one of four analyst roles: Data (Andersen & Harsell, 2005), Geographic Information Systems (Ball, 2009), Policy, or Communications. Each team was responsible for analyzing a public problem, its causes and effects, and offering solutions. The PPP team presented its findings at the end of the semester.

¹⁴ The Learning Management System (LMS) used for my course was Instructure’s Canvas platform.

Research Design and Empirical Analysis

To answer the question if it would be too ambitious to try and merge science and practice in a single course, I conducted an IRB-approved study with two objectives. The first objective is to assess students' knowledge, and abilities related to the course curriculum, before and after the course. The second objective is to evaluate the impact of assignments on students' achievement of course learning outcomes.

I employ a within-subjects, pre-test post-test, research design (Trochim & Donnelly, 2005). The pre-test is a ten-question survey that asks students to rate themselves on a five-point scale. Students rated themselves on the following: 1) knowledge of California politics; 2) social scientific understanding of state politics; 3) applied understanding of California politics; 4) ability to analyze political science scholarly journal articles; 5) ability to work in teams; 6) working knowledge of being a data analyst; 7) working knowledge of being a geographic information systems analyst; 8) working knowledge of being a policy analyst; 9) working knowledge of being a communications analyst; and 10) ability to speak in front of an audience. The post-test is a twenty-one-question survey that asks the students the same ten questions from the pre-test survey, three open-ended questions, and eight demographic questions. See Appendix 2 for the complete list of survey questions.

Forty-two students enrolled in the fall 2017 California Politics course. Five students did not complete either the pre-test or post-test surveys. Thirty-one students completed the pre-test survey while thirty-four students completed the post-test survey. Twenty-seven students completed both the pre-test and the post-test surveys. What follows is a detailed explanation of survey response to each question. The explanation includes question's relation to the PLOs and

CLOs, graphs displaying student survey responses before and after completing the course, and the results from paired t-tests and non-parametric Wilcoxon signed-rank tests.

“Researcher” Questions 1 through 4

Questions 1 through 4 focuses on the “Researcher” aspect of political science training. I define researcher as an individual who has knowledge of a specific subject matter, utilizes the scientific method to answer questions about political phenomenon, and can comfortably digest peer-reviewed political science research. As current and former political science doctoral students are aware, these are some of the basic skills needed to successfully earn a Ph.D. in the discipline. For undergraduate students, demonstrated researcher abilities can foster their interest in pursuing an advanced degree after earning the bachelor’s degree.

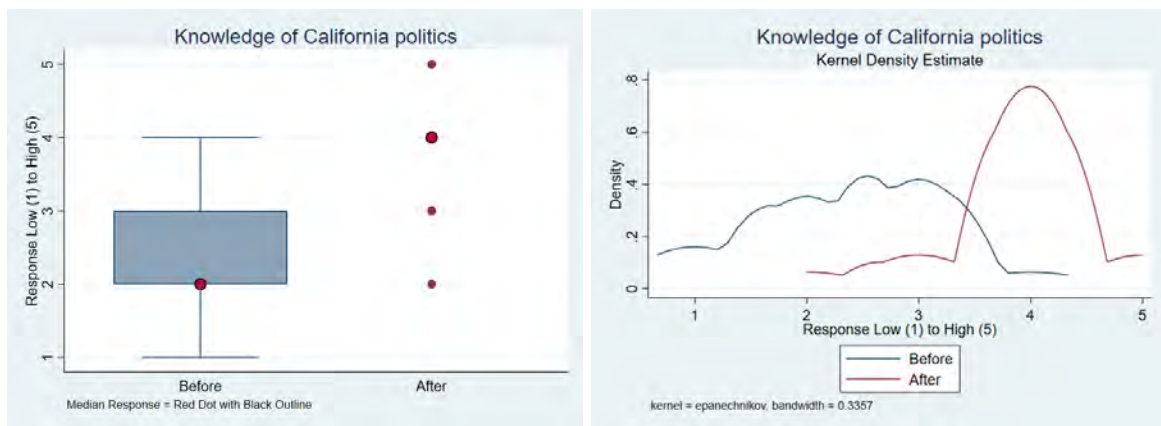
Question 1: Knowledge of California politics

The first question posed to students was: “How would you rate your knowledge of California politics on a scale from 1 (low) to 5 (high)?” This question relates to PLO #1 (knowledge of the discipline), but, due to an oversight on my part, does not have a corresponding CLO. The purpose of this question is to obtain a sense of students’ pre-existing knowledge of the subject matter. Initially, I expect most students to answer “low” since they are taking the course to learn about the subject matter. Given that each lecture and assignment is related to California or state politics, I would expect most students to answer “high” after completing the course.

Thus, my first hypothesis is:

H1: Students’ knowledge of California politics will increase by the completion of the course.

Below are boxplots and kernel density plots showing Before (pre-test, blue) and After (post-test, red) responses to the question. There are three observations to highlight. The first observation is that at the beginning of the course no students rated their knowledge of California politics “high” and the median response before the start of the course was 2 out of 5. Second, after the conclusion of the course, no students rated their knowledge of California politics as “low,” and the median response shifted to 4 out of 5. Third, the kernel density plot shows that nearly all students migrated to the “high” end of the range.



Next, are the results of a paired t-test and a non-parametric Wilcoxon signed-rank test¹⁵. A paired t-test was conducted on a sample of 27 students to compare their knowledge of California politics before and after the course. At the 95% confidence level, there was a statistically significant difference in their knowledge before ($M=2.443$, $SD=0.751$) and after ($M=3.814$, $SD=0.735$) course with an increase ($M=1.370$, CI 0.987 to 1.752); $t(26)=7.366$, $p=0.000$. Additionally, the Wilcoxon signed-rank test allows me to reject the null hypothesis that the course does not affect students’ knowledge of California politics ($z=4.510$, $p=0.000$).

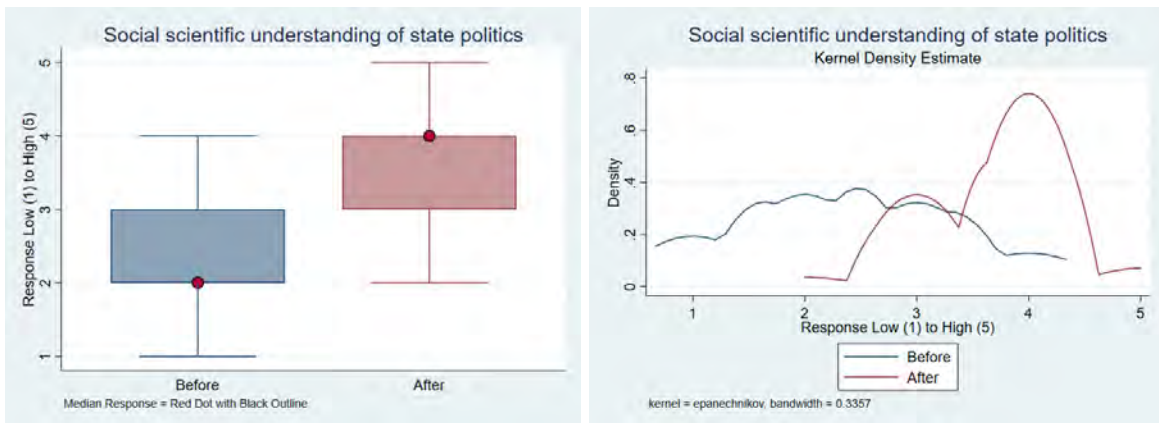
¹⁵ The paired t-test assumes that the distributions are normal, while the Wilcoxon signed-rank test assumes the distributions are symmetrical.

Question 2: Social scientific understanding of state politics

The second question students answered was: “How would you rate your social scientific understanding of state politics on a scale from 1 (low) to 5 (high)?” The question connects to PLO #2 (critical thinking and social scientific literacy) and CLO #1 (journal article analysis). The purpose of this question is to gauge students’ scientific understanding of state politics. Since this is an upper division course, I would expect most students to evaluate themselves “low” before the course and “high” after the course. The Journal Article Analysis team assignments are the primary vehicle for students to develop a social scientific literacy of state politics. A secondary vehicle is the final exam’s journal article analysis annotation and small group seminar with the professor since both focused on the “science.” My second hypothesis is:

H2: Students’ social scientific understanding of state politics will increase by the completion of the course.

Below are boxplots and kernel density plots showing Before and After responses to the question. The graphs show that the median response at the start of the course was 2 out of 5 and at the end of the course it was 4 out of 5. Second, the kernel density plot shows a sizable shift to the right, providing visual evidence that students’ social scientific understanding of state politics improved.



The results of a paired t-test and a non-parametric Wilcoxon signed-rank test follow. A paired t-test was conducted on a sample of 27 students to compare their social scientific understanding of state politics before and after the course. There was a statistically significant difference at the 95% confidence level in their knowledge before ($M=2.333$, $SD=0.960$) and after ($M=3.666$, $SD=0.679$) course with an increase ($M=1.333$, CI 0.922 to 1.743); $t(26)=6.676$, $p=0.000$. Additionally, the Wilcoxon signed-rank test allows me to reject the null hypothesis that the course does not affect students' social scientific understanding of state politics ($z=4.232$, $p=0.000$).

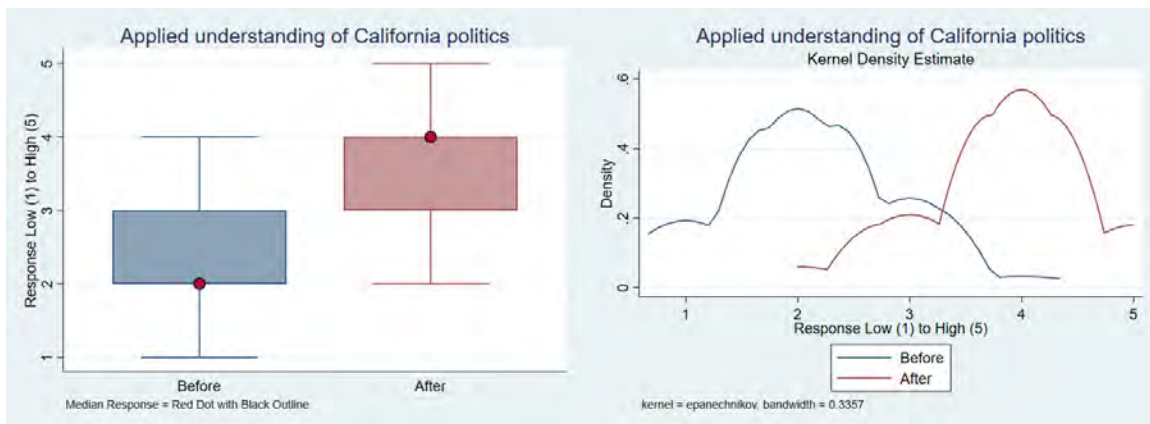
Question 3: Applied understanding of California politics

Students were asked: "How would you rate your applied understanding of California politics on a scale from 1 (low) to 5 (high)?" The question relates most closely to PLO #5 (apply theory) and CLO #3 (public policy research). Unlike question one, where students rated their knowledge of California politics, question 2 is worded differently by including the phrase "applied understanding." The meaning I had in mind was that political science research findings could be applied by influencing the behavior of elected officials, interest groups, and citizens in the real world. I expect students to answer "low" before the course and "high" after the course. Thus, my third hypothesis is:

H3: Students' applied understanding of California politics will increase by the completion of the course.

Below are boxplots and kernel density plots showing Before and After responses to the question. The boxplots show that the median response at the beginning of the course was 2 out of 5 and after the course, it was 4 out of 5. Second, the "before" kernel density plot shows that the

bulk of responses centered on 2 out of 5. The “before” plot for question three is markedly different from the “before” plot for question one, providing some reassurance that students interpreted question one and question three differently. Furthermore, the “after” kernel density plot shows a two-point shift to the right.



The results of a paired t-test and a non-parametric Wilcoxon signed-rank test follow. A paired t-test was conducted on a sample of 27 students to compare their applied understanding of California politics before and after the course. At the 95% confidence level, there was a statistically significant difference in their understanding before ($M=2.185$, $SD=0.786$) and after ($M=3.851$, $SD=0.818$) course with an increase ($M=1.666$, CI 1.302 to 2.030); $t(26)=9.414$, $p=0.000$. Moreover, the Wilcoxon signed-rank test allows me to reject the null hypothesis that the course does not affect students’ applied understanding of California politics ($z=4.562$, $p=0.000$).

Question 4: Ability to analyze political science scholarly journal articles

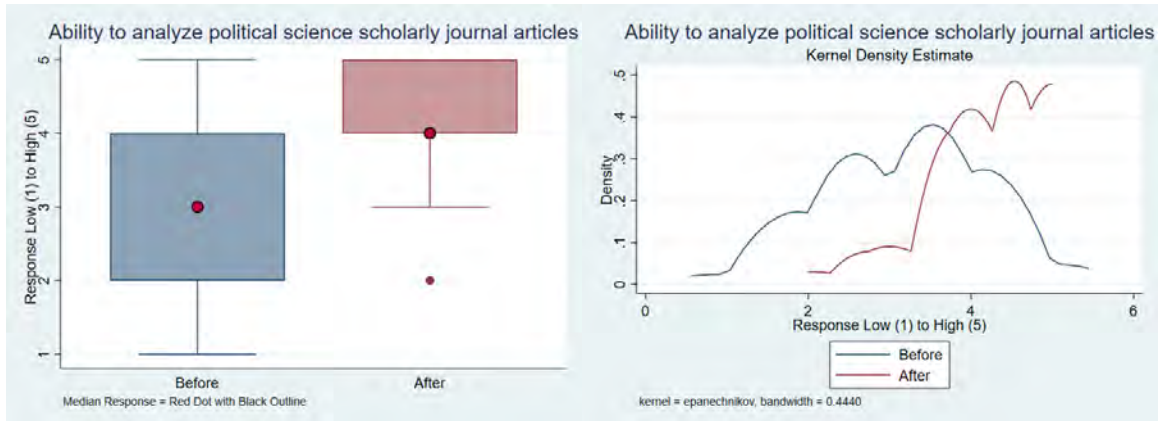
Question 4 is the final question in the “Researcher” portion of the survey. Peer-reviewed journal articles are the primary vehicle for political scientists to share their work with others in the discipline. Students majoring in political science at UC Merced are expected to be able to

analyze peer-reviewed journal articles fluently. Thus, the fourth question I asked students was: “How would you rate your ability to analyze political science scholarly journal articles on a scale from 1 (low) to 5 (high)?” This question links with PLO #1 (knowledge of the discipline), PLO #2 (critical thinking and social scientific literacy), PLO #3 (utilize research methods), and CLO #1 (journal article analysis).

Students were assigned thirty-six journal articles for the course. 8 Journal Article Analysis teams were assigned four articles each, so 32 of the articles were covered during group work, and the remaining four articles were read on their own. I expected students to thoroughly read the four articles assigned to their group, attentively listen to the oral presentations for 14 other articles and review the slides of the other 14 articles which were not orally presented during class. I expect students to answer “low” before the course and “high” after the course. The fourth hypothesis is:

H4: Students’ ability to analyze political science scholarly journal articles will increase by the completion of the course.

The boxplots and kernel density plots showing Before and After responses to the question are below. The boxplots show that the median score increased from 3 to 4. Students did not rate themselves “low” before the course possibly because this is an upper division course, so most students were senior or junior standing. The kernel density plot shows the “before” distribution slightly skewed to the right, meaning more students initially scored themselves higher on this ability than the prior questions. The “after” distribution shows that most students felt strongly enough to score themselves with a 4 or 5.



The results of a paired t-test and a non-parametric Wilcoxon signed-rank test follow. A paired t-test was conducted on a sample of 27 students to compare their ability to analyze political science scholarly journal articles before and after the course. There was a statistically significant difference at the 95% confidence level in students' understanding before ($M=3.333$, $SD=0.877$) and after ($M=4.222$, $SD=0.800$) course with an increase ($M=0.888$, CI 0.519 to 1.258); $t(26)=4.946$, $p=0.000$. Moreover, the Wilcoxon signed-rank test allows me to reject the null hypothesis that the course does not affect students' ability to analyze political science scholarly journal articles ($z=3.859$, $p=0.000$).

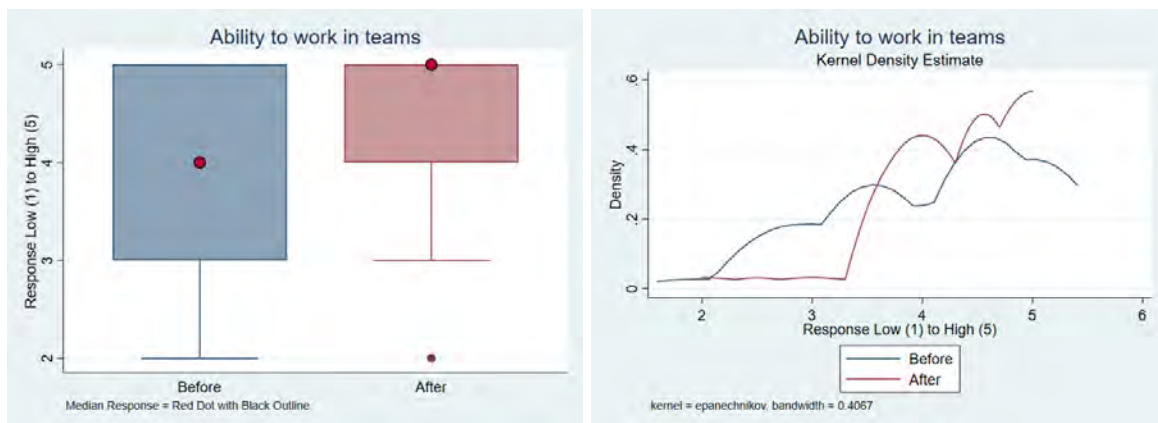
Question 5: Ability to work in teams

The ability to work in teams is an increasingly important skill for students to utilize during their time at the university and the workforce. Question five asked: "How would you rate your ability to work in teams on a scale from 1 (low) to 5 (high)?" This question directly ties to PLO #2 (apply theory) and CLO #2 (teamwork). Both the Journal Article Analysis and Public Policy Project assignments were team efforts. Students had to coordinate analyzing an article, preparing slides, and, when scheduled, orally presenting their analysis to their peers during class. Additionally, teams had to discuss, deliberate and decide on a public problem, provide bi-weekly

updates to one another, coordinate the creation of their presentation, and orally present to the class. All this is to say that students had to work in teams for the duration of the course. Thus, I expect students to answer “low” before the course and “high” after the course. The fifth hypothesis is:

H5: Students’ ability to work in teams will increase by the completion of the course.

Below are boxplots and kernel density plots showing Before and After responses to the question. There are three observations to highlight. First, many students rated their teamwork skill at 3 or higher before the course. After the conclusion of the course, almost all student rated their skill level at 4 or higher. Second, the median score was four before and five after the course. Third, unlike the prior four questions, students were more generous in their evaluations before and after the course when it came to teamwork. Students’ generosity may be because “teamwork” is a common occurrence in the university.



The results of a paired t-test and a non-parametric Wilcoxon signed-rank test follow. A paired t-test was conducted on a sample of 27 students to compare their ability to work in teams before and after the course. At the 95% confidence level, there is no statistically significant difference in their ability before ($M=4.222$, $SD=0.891$) and after ($M=4.481$, $SD=0.579$) course; $t(26)=1.657$, $p=0.054$. Moreover, the Wilcoxon signed-rank test fails to reject the null hypothesis

that the course does not affect students' ability to work in teams ($z=1.482$, $p=0.138$). Therefore, I have no statistical evidence to support hypothesis 5.

“Analyst” Questions 6 through 9

Questions 6 through 9 focuses on the “Analyst” portion of political science training. Unlike Question 3, which asked about “applied” California politics, these questions focus on specific analyst roles and their associated technical skills. Appendix 3 contains a list of specific Analyst duties and responsibilities. Moreover, a total of eight and twelve students served as one of four analysts: Data, Geographic Information Systems (GIS), Policy, and Communications.

Relatedly, students engaged in online discussions (Williams & Lahman, 2011; Wilson, Pollock, & Hamann, 2007) about their Public Policy Project teams using the course's online learning management system. During weeks 5, 7, 9, and 11, students were assigned to write a reflection about their public policy project experience and write a reply to another students' reflection. The expectation was that students would write at least four sentences for each reply and reflection. Furthermore, students were assigned to write a post-presentation reflection in week 14. This reflection had five questions¹⁶ that needed to be answered with two or more sentences.

Question 6: Working knowledge of being a data analyst

A Data Analyst is thinking about “quantitative data, spreadsheets, statistics, and causal models.” Students who assumed this role had a twenty-hour “work path” distributed across the

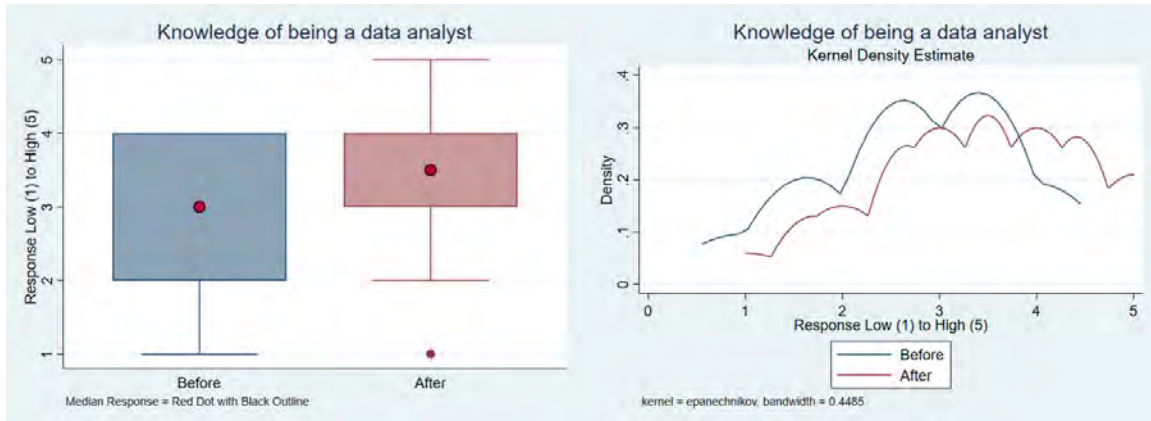
¹⁶ The five post-presentation reflection questions are: 1) How is the Public Policy Project similar to other group assignments in other courses? 2) How is the Public Policy Project different from other group assignments in other courses? 3) What did you find most interesting about the presentations? 4) What was your greatest challenge with the Public Policy Project? 5) Why is public policy important?

first 12 weeks of the semester. This work included reading a chapter on data analysis, watching “how to” STATA videos, finding data related to their public problem, creating a spreadsheet, reading a chapter on causal models, creating visual causal models, and using STATA to generate summary statistics, tabulate data, create graphs, and explain correlation and regression results.

Question 6 asks: “How would you rate your working knowledge of being a data analyst on a scale from 1 (low) to 5 (high)?” This question links to PLO #2 (critical thinking), PLO #4 (effective communications), PLO #5 (apply theory), and CLO #3 (public policy research). I expect students to answer “low” before the course and “high” after the course. Thus, my sixth hypothesis is:

H6: Students’ working knowledge of being a data analyst will increase by the completion of the course.

Below are boxplots and kernel density plots graphing students’ responses. The boxplots show a limited increase in the number of students who know about being a data analyst, with the median increasing from 3 to 3.5. Thus, unlike prior questions, this is the smallest observed shift for a question. This minimal shift may be because only 8-12 students served as a Data Analyst for the Public Policy Project team, as opposed to all students analyzing journal articles or working in teams. The kernel density plot appears to demonstrate a noticeable shift to the right, meaning students rated themselves more knowledgeable after completion of the course.



The results of a paired t-test and a non-parametric Wilcoxon signed-rank test follow. A paired t-test was conducted on a sample of 27 students to compare their knowledge of being a data analyst before and after the course. At the 95% confidence level, there is a statistically significant difference in their knowledge of being a data analyst before ($M=2.851$, $SD=0.988$) and after ($M=3.333$, $SD=1.208$) course with a positive increase ($M=0.481$, CI 0.051 to 0.911); $t(26)=2.300$, $p=0.014$. Additionally, the Wilcoxon signed-rank test allows me to reject the null hypothesis that the course does not affect students' knowledge of being a data analyst ($z=2.141$, $p=0.032$).

Question 7: Working knowledge of being a geographic information systems analyst

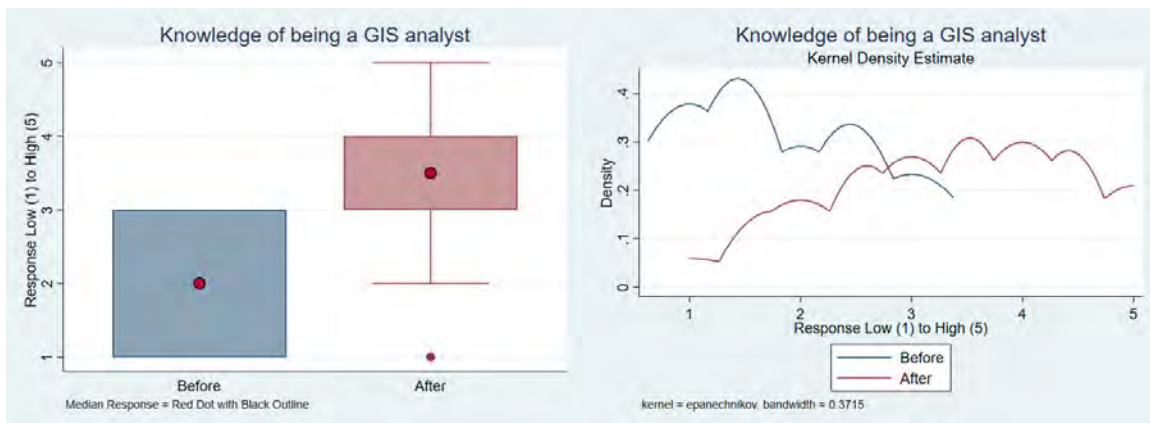
GIS has matured over the last decade. Technical advances in computer hardware, improvements in software, and higher availability of GIS data have contributed to the growing demand for GIS analysts. A GIS Analyst is thinking about “maps, physical connections, and space.” These analysts' work path included watching “how to” ArcGIS Online videos, reading a chapter about GIS, completing an online training module on ArcGIS Online, and creating at least

three maps with layers, labels, and a legend. Additionally, several students sought training from the staff at UC Merced’s Spatial Analysis Research Center¹⁷.

The seventh question of the surveys asks: “How would you rate your working knowledge of being a geographic information systems analyst on a scale from 1 (low) to 5 (high)?” Like question 6, this question derives from PLO #2 (critical thinking), PLO #4 (effective communications), PLO #5 (apply theory), and CLO #3 (public policy research). I expect students to answer “low” before the course and “high” after the course. The seventh hypothesis is:

H7: Students’ working knowledge of being a geographic information systems analyst will increase by the completion of the course.

Below are boxplots and kernel density plots showing Before and After responses to the question. The boxplots show that the no student answered 4 or higher before the course, with the median being 2. After the course, most students rated themselves 3 or higher, with the median at 3.5. Compared to the six previous questions, this one shows that many students have a low level of knowledge of a being a GIS analyst. Additionally, the kernel density plot visually reinforces this observation.



¹⁷ UC Merced’s Spatial Analysis Research Center: <http://sparc.ucmerced.edu/>

The results of a paired t-test and a non-parametric Wilcoxon signed-rank test follow. A paired t-test was conducted on a sample of 27 students to compare their knowledge of being a GIS analyst before and after the course. There was a statistically significant difference at the 95% confidence level in their understanding before ($M=1.925$, $SD=0.828$) and after ($M=3.407$, $SD=1.248$) course with a positive increase ($M=1.481$, CI 0.974 to 1.988); $t(26)=6.004$, $p=0.000$. Moreover, the Wilcoxon signed-rank test allows me to reject the null hypothesis that the course does not affect students' knowledge of being a GIS analyst ($z=4.157$, $p=0.000$).

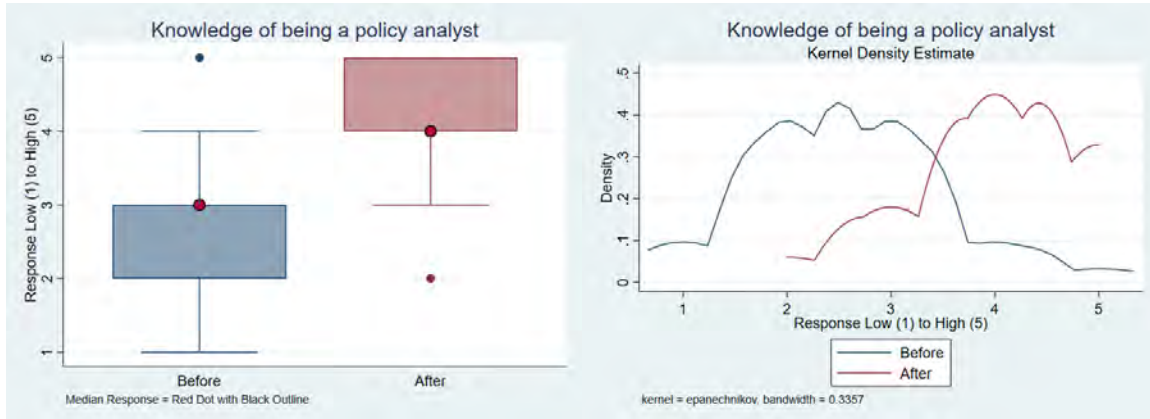
Question 8: Working knowledge of being a policy analyst

A Policy Analyst is thinking about “federal, state, and local laws and regulations, and the processes for creating them.” The work path for these analysts include reading a chapter on public policy, reviewing several tables that summarize an aspect of the policy process, developing a local, state, and federal policy change strategy, reviewing state and federal lawmaking processes, and identify a specific local, state, and federal law or regulation that they would change to help solve the public problem their team identified.

Students were asked: “How would you rate your working knowledge of being a policy analyst on a scale from 1 (low) to 5 (high)?” Like questions 6 and 7, this question also connects to PLO #2 (critical thinking), PLO #4 (effective communications), PLO #5 (apply theory), and CLO #3 (public policy research). I expect students to answer “low” before the course and “high” after the course. My eighth hypothesis is:

H8: Students' working knowledge of being a policy analyst will increase by the completion of the course.

Next, the boxplots and kernel density plots below show the Before and After responses to the question. The boxplots exhibit that many students rated themselves on the low end of the knowledge scale before the course. However, after the course, most students rated themselves on the high end of the scale. The kernel density plots show an apparent shift in knowing about being a policy analyst before and after the course.



The results of a paired t-test and a non-parametric Wilcoxon signed-rank test follow. A paired t-test was conducted on a sample of 27 students to compare their knowledge of being a policy analyst before and after the course. At the 95% confidence level, there was a statistically significant difference in their understanding before ($M=2.555$, $SD=0.933$) and after ($M=3.925$, $SD=0.873$) course with an increase ($M=1.370$, CI 1.020 to 1.719); $t(26)=8.059$, $p=0.000$. Moreover, the Wilcoxon signed-rank test allows me to reject the null hypothesis that the course does not affect students' knowledge of being a policy analyst ($z=4.491$, $p=0.000$).

Question 9: Working knowledge of being a communications analyst

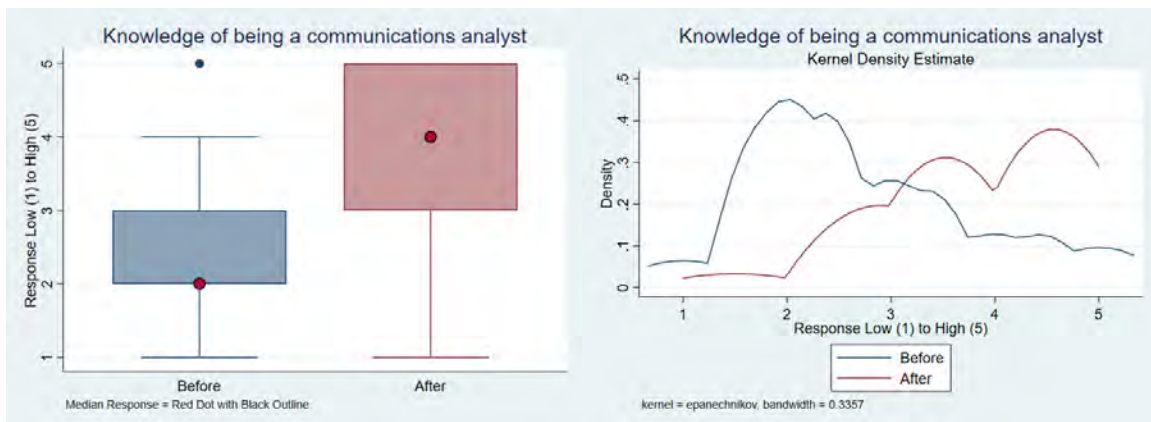
Question 9 is the last in the “Analyst” question battery. A Communications Analyst is thinking about “mass media, public opinion, and social media.” All communications analysts focused on learning an online infographic creation platform, sketching at least three infographics,

outlining the presentation, and designing infographics with the information created by other analysts, and a few even creating social media accounts. Interestingly, of the four analyst roles, this one served most as a “leader” in the sense that for them to create infographics and organize presentations, they needed their peers complete their tasks.

Question 9 asks students: “How would you rate your working knowledge of being a communications analyst on a scale from 1 (low) to 5 (high)?” This question, like the other “Analyst” questions, is also connected to PLO #2 (critical thinking), PLO #4 (effective communications), PLO #5 (apply theory), and CLO #3 (public policy research). I expect students to answer “low” before the course and “high” after the course. The ninth hypothesis is:

H9: Students’ working knowledge of being a communications analyst will increase by the completion of the course.

The boxplots below show that before the course, most students rated themselves below 3, meaning their knowledge of being a communications analyst was on the lower end of the scale. The median shifts from 2 to 4. After the course, most students rated themselves above 3. Furthermore, the kernel density plots show a marked shift between students’ knowledge before and after the course.



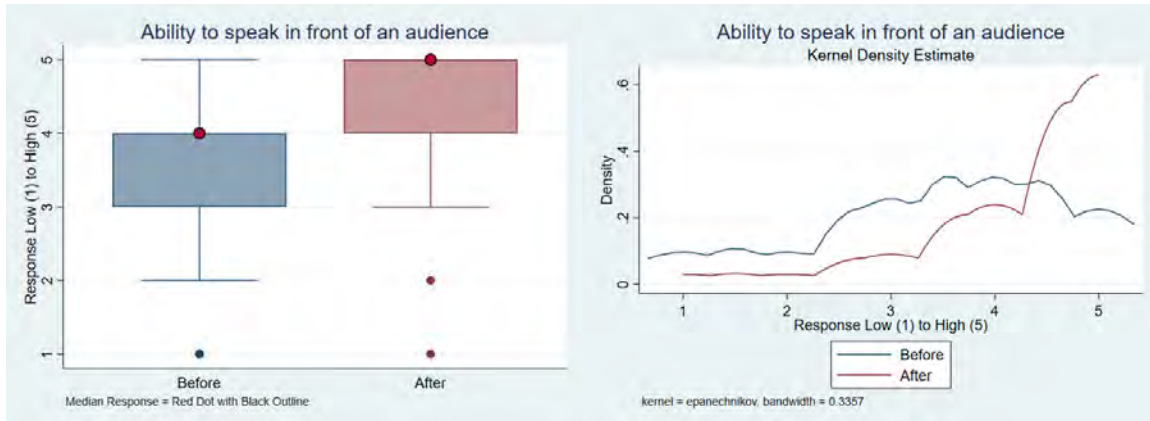
The results of a paired t-test and a non-parametric Wilcoxon signed-rank test follow. A paired t-test was conducted on a sample of 27 students to compare their knowledge of being a communications analyst before and after the course. There was a statistically significant difference in students' understanding before ($M=2.703$, $SD=1.067$) and after ($M=3.851$, $SD=1.063$) course at the 95% confidence level with an increase ($M=1.148$, CI 0.591 to 1.704); $t(26)=4.242$, $p=0.000$. Moreover, the Wilcoxon signed-rank test allows me to reject the null hypothesis that the course does not affect students' knowledge of being a communications analyst ($z=3.377$, $p=0.000$).

Question 10: Ability to speak in front of an audience

Public speaking is a useful skill since many students are communicating with groups, whether in class, at their club meetings, or in a professional environment. The tenth and final question asks students: "How would you rate your ability to speak in front of an audience on a scale from 1 (low) to 5 (high)?" This question derives from PLO #2 (critical thinking), PLO #4 (effective communication), and CLO #4 (public speaking). I expect students to answer "low" before the course and "high" after the course. The tenth hypothesis is:

H10: Students' ability to speak in front of an audience will increase by the completion of the course.

The boxplots show that most students rated themselves in the high category before the course. After the course, almost all students gave themselves a 4.5 or higher. The median before the course was 4, and after the course, it was 5, the highest score possible. The kernel density plots demonstrate a sizable shift from the upper half before the course, with a large concentration at the top end of the scale.



The results of a paired t-test and a non-parametric Wilcoxon signed-rank test follow. A paired t-test was conducted on a sample of 27 students to compare their ability to speak in front of an audience before and after the course. At the 95% confidence level, there was a statistically significant difference in their ability before ($M=3.481$, $SD=1.251$) and after ($M=4.370$, $SD=1.043$) course with increase ($M=0.888$, $CI\ 0.572\ to\ 1.205$); $t(26)=5.768$, $p=0.000$. Moreover, the Wilcoxon signed-rank test allows me to reject the null hypothesis that the course does not affect students' ability to speak in front of an audience ($z=4.027$, $p=0.000$).

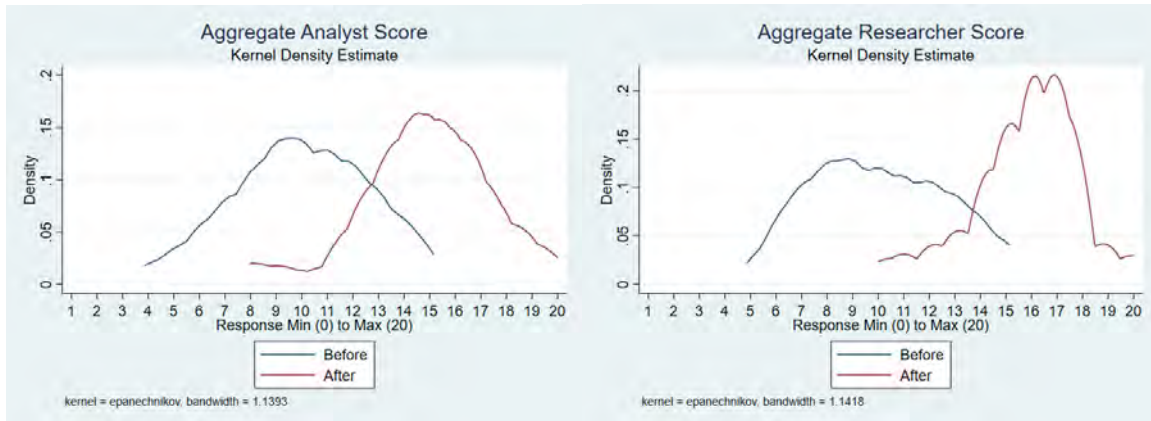
Self-Assessment compared to an Objective Assessment

Questions 1-4 and 6-9 are students' self-assessment of their growth in researcher and analyst knowledge and skills, respectively. Self-assessments can exhibit bias (Boud & Falchikov, 1989) and thus be an incomplete measure of a student's actual attainment of knowledge and skills. An objective (or at least less subjective) measure of knowledge and skill attainment can be performance on an exam. Recall that the final exam for the course consists of three parts: a journal article analysis annotation, a small group seminar with the professor, and a one-hundred question exam proctored in person but completed via the course's online learning management system. The results from the one-hundred question exam will serve as a potentially objective measure of students' actual attainment of researcher and analyst knowledge and skills.

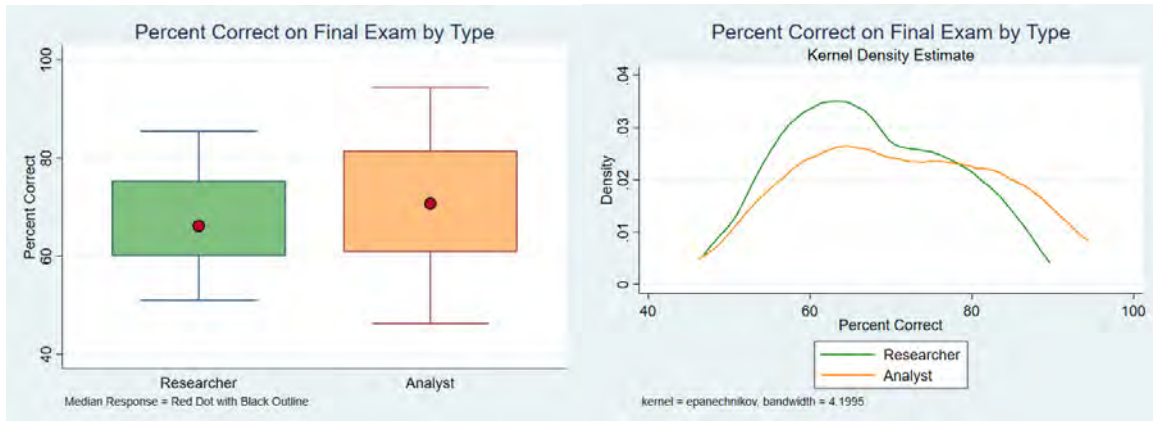
Each student was randomly generated a one-hundred question exam from a question bank of 145 questions. I reviewed each question in the bank to determine whether it was a “researcher” or “analyst” question. I designated 56 questions as researcher oriented related and 89 questions as analyst related¹⁸. Students were asked between 33 to 45 researcher questions while they were presented with 55 to 67 analyst questions. The variance is due to the randomly generated process by which final exams were created for each student. In other words, some students got more, while some students got less of each type of question.

To compare self-assessment with the objective assessment, I first aggregate the subjective before and after scores for “researcher” questions and “analyst” questions that students gave themselves. For example, there are four researcher questions where students could score themselves 0 to 5 for each. This means a student could have an aggregate before score between 0 to 20 and an aggregate after score between 0 to 20 when it comes to researcher knowledge and skills. Below is a kernel density plot showing the aggregate analyst and researcher scores. The Aggregate Analyst Score plot shows that at the beginning of the course, most students rated themselves around 10 out of 20. At the end of the course, most students rated themselves around 15 out of 20. The Aggregate Researcher Score plot shows that most students rated themselves around 10 before the course and around 16 after the course. One notable difference between the plots are that more students rated their researcher knowledge and skills higher after the course, compared to their analyst knowledge and skills.

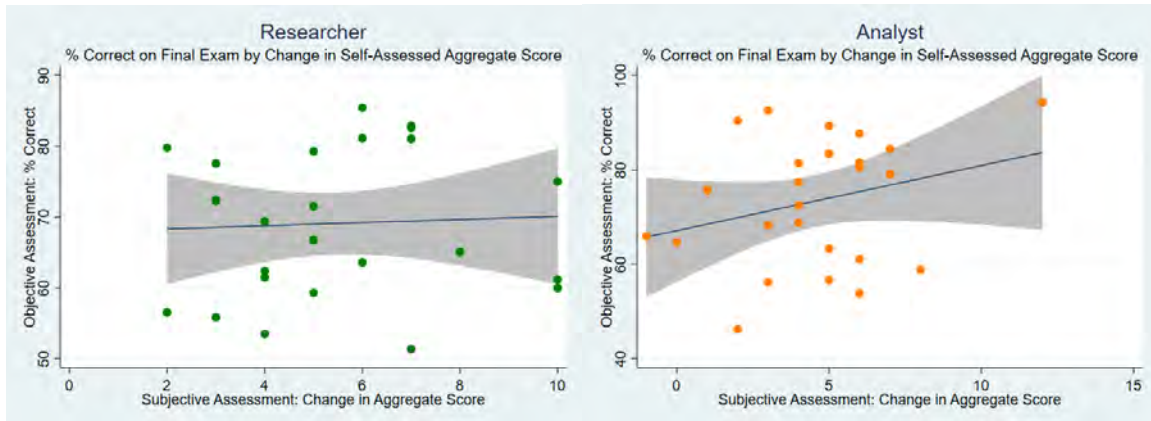
¹⁸ An example of a researcher question is: “Journals: Per your reading of Cayton, A. (2016). Why Are Some Institutions Replaced while Others Persist? Evidence from State Constitutions. *State Politics Policy Quarterly*, 16(3), 267-289. What is theoretically unavoidable?” While an example of an analyst question is: “Elections: How many Congressional Districts does California have?”



Since each student had a different number of researcher questions and analyst questions asked on their final exam, I generate the percent correct for each type of question. For example, if a student was asked 62 “analyst” questions on the final exam, this means they were asked 38 “researcher” questions. However, another student could have been asked 55 analyst questions and 45 researcher questions. Thus, to compare across students, a percent correct by question type is used. Below is a boxplot and kernel density plot of the Percent Correct on Final Exam by Question Type. There are two observations to make. The first observation is that the median percent correct for researcher questions is slightly lower than analyst questions. Secondly, the distribution of percent correct is wider for analyst questions than researcher questions. This may be due to the number of questions asked: more analyst questions were asked of students than researcher questions. Nonetheless, we have a clear sense of how students performed on the two types of questions.



I expect to see a positive correlation between the subjective and objective assessments. For example, as students' subjective change in aggregate score increases, their percent correct on the related final exam questions should increase. The idea is that students' self-assessment should move in tandem with their objective performance. Both the subjective and objective assessments are attempts to measure the same concept of attaining knowledge and skills of being a researcher or analyst. Below are scatterplots with a fitted line and confidence interval for Research and Analyst, respectively. On the y-axis is the objective assessment, which is the percent correct of either researcher or analyst questions on the final exam. On the x-axis is the subjective assessment, which is the change (or difference between after and before scores) in aggregate researcher or analyst score. As stated earlier, I expect to see a positive correlation. For the Researcher measure, there is an ever so slight positive correlation. However, it can be considered flat and therefore no relationship between the subjective and objective assessment when it comes to Researcher knowledge and skills. On the other hand, for the Analyst measure, there is a clear positive correlation. Thus, there appears to be a relationship between subjective and objective assessments for Analysts knowledge and skills. However, this may be attributed to the outlier in the upper-right corner.



Conclusion

Every year, over 1,100 colleges and universities across the United States are graduating over 30,000 students who hold a Bachelor’s degree in political science. Whether their training emphasizes becoming a scientific “researcher” or an applied “analyst” is unknown. However, according to the Bureau of Labor Statistics¹⁹: “Political scientists usually conduct research in one of the following areas: national politics, comparative politics, international relations, or political theory [or] political scientists also work as policy analysts for organizations that have a stake in policy, such as government, labor unions, and political groups.” So, if this is the case, are we training researchers, analysts, or both?

While political science departments may offer internship, service learning, or a capstone experience, this may not be enough. I believe we should train researchers and analysts within every course because helping students learn the science and practice the politics can prepare them for more opportunities after they graduate with a Bachelor’s degree in the discipline. So, was it too ambitious to try and merge science and practice in a single 16-week, upper division course on California Politics? The within-subjects, pre-test post-test, research design,

¹⁹ “What Political Scientists Do”, Bureau of Labor Statistics, <https://www.bls.gov/ooh/life-physical-and-social-science/political-scientists.htm#tab-2>

quantitative survey data, and statistical evidence largely demonstrate that students got the “science” and “practice” in a single course.

Let’s think about it another way. Students take approximately thirty-two courses that are worth four semester-units each. This means students complete one-hundred and twenty-eight semester-units to earn a Bachelor’s degree. Students may have four to sixteen semester-units of internship, service learning, or a capstone experience during their undergraduate academic career.

But is this enough to prepare them for positions that only require a Bachelor’s degree in political science? I’d argue no. Instead, students should have sixty-four semester-units geared towards the “practice” complemented by the “science” of politics. What my research provides is a proof of concept that it is readily possible, for those who are willing, to effectively merge the science and practice of politics within each course.

Appendix 1: Learning Units and their Learning Objectives

Learning Units (LUs) is a self-contained unit that includes learning objectives, content, and assessments for a specific topic. Each LU has a lecture associated with it that runs a minimum of 30 minutes and up to 60 minutes. These time blocks may include question-and-answer and small student group discussions.

#	Learning Unit	Objectives
1	Political Science	<p>Explain what political science is</p> <p>Describe the scientific method</p> <p>Explain the difference between political institutions, processes, and behaviors</p> <p>Use the 2x2 square</p>
2	Histories	<p>Explain why history matters</p> <p>Define historical institutionalism</p> <p>Define American Political Development</p> <p>Explain how history and politics interact</p>
3	Geographies	<p>Define geography, geographic determinism, and applied geography</p> <p>Define geographic information system</p> <p>Explain the difference between spatial analysis and spatial statistics</p>
4	Environment	<p>Define environment</p> <p>Interpret maps depicting some aspect of the environment</p> <p>Explain how the environment and politics interact</p>
5	Societies	<p>Explain population density</p> <p>Describe race and ethnicity</p> <p>Define social capital</p> <p>Explain how agent-based modeling can be used to explain racial/ethnic segregation</p>
6	Economies	<p>Explain prosperity and poverty</p> <p>Describe different measures of the economy</p> <p>Define CA economic regions</p> <p>Explain challenges of affordable housing and homelessness</p>
7	Transportation and Infrastructure	<p>Describe six forms of transportation and infrastructure</p> <p>Differentiate between federal, state, and local California water infrastructure</p> <p>Describe how highways without semi-trucks and with semi-trucks affects traffic congestion</p>
8	Constitutions	<p>Define constitution</p> <p>Define law</p> <p>Describe the hierarchy of constitutions and laws</p> <p>Explain why institutions persist</p>
9	Federal Government	<p>Define federalism and devolution</p> <p>Explain the 10th amendment and interstate compacts</p>

#	Learning Unit	Objectives
		Describe the federal executive, legislative, and judicial branches and their relation to the states
10	Tribal Governments	Define tribal governments Identify tribal lands across the United States Explain how tribal governments interact with state governments
11	Local Governments	Define local government and devolution with local government Describe the Census of Governments Describe special-purpose districts Explain Local Agency Formation Commissions and city general plan
12	Redistricting	Differentiate between redistricting and reapportionment Explain what California's Redistricting Commission does Utilize GIS for Redistricting
13	Elections	Identify electoral districts Describe elections and their types Describe why you want to make a difference
14	Direct Democracy	Explain the Progressive Movement Describe the initiative, referendum, and recall Demonstrate the differences between direct democracy mechanisms
15	Representatives	Differentiate between types of representation Describe different views of representation Explain the principal-agent model Identify an employment opportunity in California State Legislature
16	Lobbyists	Describe lobbying and lobbyists Articulate a theory of lobbying Recognize lobbyists' characteristics Discover lobbyist employment opportunities
17	Interest Groups	Recognize different types of interest groups Describe how Interest Groups shape public opinion and policy Utilize the Agent-Vector-Host Model
18	Public Opinions	Define public opinion, polling and survey types and questions Read a "cross-tab"
19	Budgets	Define budgets Describe how the US Federal Government and CA State Government budget processes interact Differentiate between proposed and enacted budget
20	Executives	Explain what Governors do

#	Learning Unit	Objectives
		Identify all of California's "constitutional" officers Describe California's "fragmented" executive
21	Judiciaries	Describe the structure of the California judiciary Differentiate between trial, appeal, and Supreme Courts Identify employment opportunities in the California Judicial Branch
22	Legislatures	Analyze the California State Legislature, its organization and processes Identify your State Senator and State Assembly member Recognize the application process for the Capitol Fellows Program
23	Bureaucracies	Define bureaucracy Explain the California Code of Regulations Identify 4 major CA bureaucracies
24	Public Policy	Define public policy Explain the public policy process Analyze public policy across local, state and federal policy making forums with 3 case studies

Appendix 2: Pre-test/Post-test Survey Questions

Pre-test survey questions:

1. How would you rate your knowledge of California politics on a scale from 1 (low) to 5 (high)?
2. How would you rate your social scientific understanding of state politics on a scale from 1 (low) to 5 (high)?
3. How would you rate your applied understanding of California politics on a scale from 1 (low) to 5 (high)?
4. How would you rate your ability to analyze political science scholarly journal articles on a scale from 1 (low) to 5 (high)?
5. How would you rate your ability to work in teams on a scale from 1 (low) to 5 (high)?
6. How would you rate your working knowledge of being a data analyst on a scale from 1 (low) to 5 (high)?
7. How would you rate your working knowledge of being a geographic information systems analyst on a scale from 1 (low) to 5 (high)?
8. How would you rate your working knowledge of being a policy analyst on a scale from 1 (low) to 5 (high)?
9. How would you rate your working knowledge of being a communications analyst on a scale from 1 (low) to 5 (high)?
10. How would you rate your ability to speak in front of an audience on a scale from 1 (low) to 5 (high)?

Post-test survey questions

1. How would you rate your knowledge of California politics on a scale from 1 (low) to 5 (high)?
2. How would you rate your social scientific understanding of state politics on a scale from 1 (low) to 5 (high)?
3. How would you rate your applied understanding of California politics on a scale from 1 (low) to 5 (high)?
4. How would you rate your ability to analyze political science scholarly journal articles on a scale from 1 (low) to 5 (high)?
5. How would you rate your ability to work in teams on a scale from 1 (low) to 5 (high)?
6. How would you rate your working knowledge of being a data analyst on a scale from 1 (low) to 5 (high)?
7. How would you rate your working knowledge of being a geographic information systems analyst on a scale from 1 (low) to 5 (high)?
8. How would you rate your working knowledge of being a policy analyst on a scale from 1 (low) to 5 (high)?
9. How would you rate your working knowledge of being a communications analyst on a scale from 1 (low) to 5 (high)?
10. How would you rate your ability to speak in front of an audience on a scale from 1 (low) to 5 (high)?
11. What analyst role did you have?

- a. Data Analyst
 - b. GIS Analyst
 - c. Policy Analyst
 - d. Communications Analyst
12. What's your age?
13. What's your gender?
- a. Female
 - b. Male
 - c. Other
14. What's your race/ethnicity?
- a. American Indian or Alaskan Native
 - b. Asian
 - c. Black or African-American
 - d. Hispanic
 - e. Latino
 - f. Other
 - g. White
15. What's your major?
16. What's your academic standing?
- a. Freshman
 - b. Sophomore
 - c. Junior
 - d. Senior
17. Are you a community college transfer student?
18. Are you a 1st generation college student?
19. What did you like most about the class?
20. What did you like least about the class?
21. Is there anything else you'd like to share?

Appendix 3: Public Policy Project Team, Duties and Responsibilities by Analyst Type

The Public Policy Project Team

Data Analyst

Duties

- Proficiency/Interest in learning STATA
- Learning STATA

Responsibilities

- Find data sources
- Document data retrieval and collection process
- Prepare data for use in spreadsheet
- Communicate data structure to team
- Conduct data analysis

Geographic Information Systems Analyst

Duties

- Proficiency/Interest in learning ArcGIS Online
- Learning ArcGIS Online

Responsibilities

- Find GIS data sources
- Document GIS data retrieval and collection process
- Prepare GIS data in ArcGIS Online
- Communicate GIS data structure to team
- Conduct GIS analysis

Policy Analyst

Duties

- Proficiency/Interest in learning in policy analysis
- Learning Public Policy Analysis

Responsibilities

- Find policy sources
- Read policies
- Summarize policies
- Communicate policy findings to team

Communications Analyst

Duties

- Proficiency/Interest in learning communications or marketing
- Learning Venngage or Piktochart

Responsibilities

- Coordinate production of PowerPoint Presentation slides with team members
- Compile slides into a PowerPoint Presentation
- Produce infographics in collaboration with Data, GIS, and Policy Analysts

References

- Andersen, K., & Harsell, D. M. (2005). Assessing the Impact of a Quantitative Skills Course for Undergraduates. *Journal of Political Science Education, 1*(1), 17-27. doi:10.1080/15512160490921824
- Anderson, L. W., Krathwohl, D. R., Airasian, W., Cruikshank, K., Mayer, R., & Pintrich, P. (2001). A taxonomy for learning, teaching and assessing: A revision of Bloom's Taxonomy of educational outcomes: Complete edition. NY: Longman.
- Ball, W. J. (2009). Learning the Local Political Landscape with Geographic Information Systems (GIS). *Journal of Political Science Education, 5*(3), 198-213. doi:10.1080/15512160903035633
- Bergbower, M. L. (2017). When are Students Ready for Research Methods? A Curriculum Mapping Argument for the Political Science Major. *Journal of Political Science Education, 13*(2), 200-210. doi:10.1080/15512169.2017.1292917
- Bloom, B. S. (1956). Taxonomy of educational objectives. Vol. 1: Cognitive domain. New York: McKay, 20-24.
- Boud, D., & Falchikov, N. (1989). Quantitative studies of student self-assessment in higher education: A critical analysis of findings. *Higher Education, 18*(5), 529-549.
- Brickhouse, T. C., & Smith, N. D. (2009). Socratic teaching and Socratic method. In *The Oxford handbook of philosophy of education*.
- Craig, J. (2010). Practitioner-Focused Degrees in Politics. *Journal of Political Science Education, 6*(4), 391-404. doi:10.1080/15512169.2010.518086
- Craig, J. (2018). *Political Science as a Taught Discipline: Uncovering a century of debate on what, how and why it should be studied*. Paper presented at the American Political Science Association Teaching and Learning Conference, Baltimore, Maryland.
- Crouch, C. H., & Mazur, E. (2001). Peer Instruction: Ten years of experience and results. *American journal of physics, 69*(9), 970-977. doi:Doi 10.1119/1.1374249
- Damron, D., & Mott, J. (2005). Creating an Interactive Classroom: Enhancing Student Engagement and Learning in Political Science Courses. *Journal of Political Science Education, 1*(3), 367-383. doi:10.1080/15512160500261228
- Deardorff, M. D., & Folger, P. J. (2005). Assessment that Matters: Integrating the "Chore" of Department-Based Assessment with Real Improvements in Political Science Education. *Journal of Political Science Education, 1*(3), 277-287. doi:10.1080/15512160500261129
- Edwards, H., Smith, B., & Webb, G. (2012). *Lecturing: Case studies, experience and practice*: Routledge.
- Egan, K. (1978). What is curriculum? *Curriculum Inquiry, 8*(1), 65-72.
- Haines, C. G. (1915). Report of Committee of Seven on Instruction in Colleges and Universities. *American Political Science Review, 9*(2), 353-374.
- Hansford, T. G., & Nicholson, S. P. (2008). When t=1 and N=2: Creating a political science program at a new research university. *Ps-Political Science & Politics, 41*(2), 371-374.
- Hartlaub, S. G., & Lancaster, F. A. (2008). Teacher Characteristics and Pedagogy in Political Science. *Journal of Political Science Education, 4*(4), 377-393. doi:10.1080/15512160802413741
- Hartley, J., & Cameron, A. (1967). Some observations on the efficiency of lecturing. *Educational Review, 20*(1), 30-37.
- Huerta, J. C. (2007). Getting Active in the Large Lecture. *Journal of Political Science Education, 3*(3), 237-249. doi:10.1080/15512160701558224

- Hummer, J. A. (2014). The Content and Integrative Component of Capstone Experiences: An Analysis of Political Science Undergraduate Programs. *Journal of Political Science Education*, 10(2), 222-242. doi:10.1080/15512169.2014.894366
- Isacoff, J. B. (2014). Achieving What Political Science Is For. *Journal of Political Science Education*, 10(4), 414-423. doi:10.1080/15512169.2014.947416
- Ishiyama, J., Breuning, M., & Lopez, L. (2006). A century of continuity and (little) change in the undergraduate political science curriculum. *American Political Science Review*, 100(4), 659-665. doi:Doi 10.1017/S0003055406062551
- Laves, W. H. C. (1940). The Next Decade in Political Science Teaching. *American Political Science Review*, 34(5), 983-986. doi:Doi 10.2307/1949222
- McClellan, E. F. (2015). Best practices in the American undergraduate political science curriculum. In J. Ishiyama, W. J. Miller, & E. Simon (Eds.), *Handbook on Teaching and Learning in Political Science and International Relations* (pp. 1): Edward Elgar Publishing.
- Mitchell, K. M. W., & Manzo, W. R. (2018). The Purpose and Perception of Learning Objectives. *Journal of Political Science Education*, 1-17. doi:10.1080/15512169.2018.1433542
- Piland, W. E. (1995). Community college transfer students who earn bachelor's degrees. *Community College Review*, 23(3), 35-44.
- Szypszak, C. (2015). Socratic Method for the Right Reasons and in the Right Way: Lessons from Teaching Legal Analysis Beyond the American Law School. *Journal of Political Science Education*, 11(3), 358-369. doi:10.1080/15512169.2015.1047106
- Taniguchi, H., & Kaufman, G. (2005). Degree completion among nontraditional college students. *Social Science Quarterly*, 86(4), 912-927. doi:DOI 10.1111/j.0038-4941.2005.00363.x
- Tiruneh, G. (2007). Does Attendance Enhance Political Science Grades? *Journal of Political Science Education*, 3(3), 265-276. doi:10.1080/15512160701620776
- Trochim, W. M. K., & Donnelly, J. P. (2005). *Research Methods Knowledge Base* (3 ed.). Cincinnati, Ohio: Atomic Dog Pub.
- Wahlke, J. C. (1991). Liberal Learning and the Political-Science Major - a Report to the Profession. *Ps-Political Science & Politics*, 24(1), 48-60. doi:Doi 10.2307/419376
- Williams, L., & Lahman, M. (2011). Online Discussion, Student Engagement, and Critical Thinking. *Journal of Political Science Education*, 7(2), 143-162. doi:10.1080/15512169.2011.564919
- Wilson, B. M., Pollock, P. H., & Hamann, K. (2007). Does Active Learning Enhance Learner Outcomes? Evidence from Discussion Participation in Online Classes. *Journal of Political Science Education*, 3(2), 131-142. doi:10.1080/15512160701338304
- Wolfe, A. (2012). Implementing Collaborative Learning Methods in the Political Science Classroom. *Journal of Political Science Education*, 8(4), 420-432. doi:10.1080/15512169.2012.729451
- Wukich, C., & Siciliano, M. D. (2014). Problem Solving and Creativity in Public Policy Courses: Promoting Interest and Civic Engagement. *Journal of Political Science Education*, 10(3), 352-368. doi:10.1080/15512169.2014.921625
- Young, C. C., Cartwright, D. K., & Rudy, M. (2014). To Resist, Acquiesce, or Internalize: Departmental Responsiveness to Demands for Outcomes Assessment. *Journal of Political Science Education*, 10(1), 3-22. doi:10.1080/15512169.2013.862502

