A Meta-Analysis of Extant Literature on Teaching Research Methods: Preliminary Analysis Findings

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Abstract: Over the past three decades, an increasing amount of research has been conducted on what techniques and approaches work best to teach research methods to political science students. In this paper, we present the first cut of a meta-analysis of the state of this literature. In this paper we provide an overview of the published works in the primary journals through with political science pedagogy is published, including an overview of what kinds of questions are being asked, by whom, and with what results. Next steps will include attempts to find and examine, to the extent possible, the same for pieces that have not yet been published. Finally, we will pull these together in an attempt to develop a full description of the research about the field and potentially build a technical meta-analysis.

A Meta-Analysis of Extant Literature on Teaching Research Methods
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The Science of Teaching and Learning (SoTL) has emerged as a new and increasingly recognized sub-field of political science in recent years. While pedagogy research has its roots in an era long before political science took an interest in it (see for example the work on pedagogy by John Dewey in the early twentieth century (1997)) and faces controversies over whether it is a science at all (Legemann 2000), the discipline has more recently embraced it.

Political science's interest in pedagogy research tracks that of academia more generally. According to a review by the Association of College and Research Libraries (ACRL, a division of the American Library Association), there are approximately 113 separate journals dedicated solely to pedagogy research for different disciplines within higher education, breaking out by general higher education journals (16), arts and humanities (30), general humanities (21), science and mathematics (23), and social sciences (23).[1] While this list is not complete in that it does not include journals with multiple foci including pedagogy (e.g., *PS: Political Science and Politics*) nor does it include related sub-field pedagogy journals (e.g., *Journal of Public Affairs Education*), the proliferation of these journals underscores higher education's commitment to better understanding how we do what we are designed to do: teach. Figure 1 provides a graph of the start dates of all of these journals.

Comparatively, political science is late to the game. Despite this, interest in how we teach is evident throughout the history of the profession. For example, a year after the inaugural issue of *PS: Political Science and Politics* it published its first pedagogy pieces. The first was a

[1] Accessed from https://acrl.ala.org/IS/instruction-tools-resources-2/pedagogy/a-selected-list-of-journals-on-teaching-learning/ on 1/28/20

reflective essay bemoaning the lack of research on how to measure good teaching or "instruction on how to be a good teacher" (Fein 1969). The second pedagogy piece published in *PS* was a quasi-experiment designed to determine whether students learn more through traditional studying for exams or through preparing for oral exposition of learning through student-based interviews (Hanus 1969).

Among the myriad topics covered by political science pedagogy today, how to teach students to conduct research about the discipline is critically important in two ways. First, teaching about research methods runs parallel to sub-discipline and therefore is applicable to almost all sub-disciplines (excepting, perhaps, normative theory), making it relevant to all political scientists and all of our students. Second, research conducted about teaching the topic itself ought to reflect in important ways the quality of what is happening in the classroom. Despite this, SoTL research about teaching research methods for political science is not robust—a cursory examination of all of the pieces published in the *Journal of Political Science Education* between 2017-2019 shows 8 teaching research methods from 144,[2] or a scant 5.5%.[3]

To better understand the state of research on teaching research methods, this paper presents the first cut of a larger meta-analysis. We first begin to trace efforts to enhance teaching research methods in political science. We then lay out our approach to developing the larger meta-analysis, followed by a summary of our cursory analysis of the state of knowledge in the field. We conclude with a discussion of the implications of what we have found so far along with an explication of next steps in this project. Our preliminary findings suggest that SoTL research

[2] This is inclusive of all publications in this time period, including SoTL, instruction, reflection, and book and product review articles.

[3] Our thanks to Auburn University graduate research assistant Zach Mahafza for coding these articles for focus and approach.

on how to teach research methods lags behind what is actually taught in terms of both approach and rigor.

Efforts to Enhance Teaching Research Methods in Political Science

Efforts to enhance teaching of research methods have proliferated over the past thirty years. In this section, we briefly describe the efforts of the American Political Science Association (APSA) related to supporting teaching generally and pedagogy specifically, discuss the extant journals to support political science pedagogy and pedagogy research, and briefly touch on other efforts that influence our discipline. We use this to conclude with some basic expectations for what we will find in the extant literature.

APSA's role in pedagogy has been active from the start of the association, but the role of methodology in the field and how we teach it has been consistently problematic. For example, in the first state of the discipline book (Finifter 1983), Christopher Achen writes about methodology and teaching that

> …political methodologists have expended much of their energies teaching the rest of the discipline new statistical techniques invented in other fields…. Intellectual middlemen have their uses, of course…. But remedial teaching is not scholarship (70).

Indeed, a review of all three of the state of the discipline books published to date demonstrates that teaching and pedagogy has historically been seen as hardly relevant, with the term pedagogy itself showing up only in the 2003 edition, and discussions of teaching across all of the volumes as side mentions to part of the work of accomplished scholars that are highlighted in the volumes. While admittedly the purpose of these books is to chronicle the state of research of the

field, the fact that there is no mention of research on teaching as part of the discipline quite clearly states the value that has been attributed to this type of work.

But this is not to suggest that APSA has focused solely on research to the exclusion of teaching. Indeed, as early as the 1950s the APSA Committee for the Advancement of Teaching made public statements about the quality of instruction (see for example APSA 1951) and did so indirectly through earlier reports (see for example the 1908 committee report on instruction in government). Note, however, that most of these early efforts were focused primarily on the state of instruction about civics and government in high schools (Ahmad 2017). And as noted above, APSA began distributing literature about teaching to its membership in the 1960s through *PS: Political Science and Politics*.

This all changed in the early 2000s with the advent of the APSA Teaching and Learning Conference (or TLC) in 2004, created under the leadership of APSA president Michael Britnall. Since that time, the meeting has grown significantly, and though APSA decided to move to a biannual as opposed to annual model, it concurrently rolled the TLC into the association's annual conference and has begun developing other programs to support teaching and pedagogy research for the discipline, including the development of teaching meetings through the Centennial Center, adding the *Journal of Political Science Education* as an official APSA journal (a product of the success of early TLC meetings), entering into an agreement for a joint international teaching conference, and providing other online products to support teaching for members. APSA has two organized sections related to teaching that work together to produce a regular newsletter, provide teaching awards, and advocate for greater attention and resources for teaching.

APSA is not alone in advancing the work of teaching in the discipline, but certainly does the most across all of the disciplinary associations. Regional associations like the MPSA and SPSA, and related field associations like ISA and NASPAA, also have teaching sections and make space at their conferences for presentation of this work. Outside of *PS: Political Science and Politics* and the *Journal of Political Science Education* there are other peer-reviewed journals that produce pedagogy research, most notably the *Journal of Public Affairs Education*, among others.

Collectively, these meetings and journals engage to a degree with teaching research methods. Among them, the TLC has consistently included a section related to teaching research methods and has done more than any other effort to support this work. Anecdotally, the research presented at these meetings in particular about teaching research methods focuses primarily on basic statistics, followed by research design, then followed by a smattering of niche interests, and the methods used to engage in SoTL about teaching research methods is in many cases even more nascent than what is being taught.

This points to two themes prevalent in the discipline for teaching research methods. First, there is no method or set of methods per se of the discipline, which is reflected in both what is taught and the pedagogy research we engage in. And second, the level of rigor in how we try to understand what we do is limited. The purpose of this project is two-fold: first, to systematically examine the state of research about teaching methods in political science; and second, to identify a set of studies that can be used to develop a larger meta-analysis focused on what we do know about how to do this.

Developing a Meta-Analysis

This paper presents the first snapshot of our attempt to develop a meta-analysis for SoTL research on teaching research methods. A meta-analysis compiles the results of multiple evaluations on the same topic and synthesizes the findings. Oftentimes in experimental research it is impossible to get a sample size large enough to give us adequate statistical power to identify intervention effects. However, if multiple studies have been conducted to examine the same or similar phenomena, they can be pooled and re-examined to reach a stronger conclusion about the results. This is particularly important when similar studies reach different conclusions or there are subgroups within sample sets that we want to examine but we cannot because within each of the studies the n is too low (Cooper and Lindsay 1998).

There are two ways to go about conducting a meta-analysis, and eventually we hope to do both. The first consists of a systematic review, in which researchers identify all of the possible research conducted on the topic, published or unpublished, determine in advance what information they will glean from each study and follow that plan specifically and without focusing on one study more than on another one (Crombie and Davies 2009; Moher et al 2009). Each component is then systematically analyzed and synthesized to draw conclusions about the phenomenon under investigation. This is what we begin in this paper. The second, more traditional approach, is described above.

As a first step, we are engaged in finding, cataloguing, and coding the extant research on teaching research methods in political science. To date, we have coded 75 published articles and book chapters (not yet exhaustive) published between 1991 and 2019. These articles and book chapters are listed in Appendix A below.

In addition to the outlet and year of publication, we have variables for each study related to the topic, the authors, the analytic approach, and the findings. Author information coded includes:

- Number of authors
- Gender of the first author (using binary, cis-normative categories)
- Rank at the time of publication of the first author (student status, research fellow, instructor, or types of professor)
- Institution at the time of publication of the first author (high school versus types of institutions of higher education)

Variables coded related to analytic approach include:

- Type of research according to Hamman, Pollock and Wilson (2009)
- Type of analysis (none, summary, non-experimental qualitative, mixed methods, non-experimental statistical, quasi-experimental, and experimental)
- Sample size

Finally, we have open-ended but not yet coded information about topic and findings. In this paper, we summarize these data and present some initial analyses.

State of Knowledge of the Field

In this section, we review what is being published, where, by whom, and what the evidence base we are using to know about the field looks like. We begin a discussion of what we think we have learned, but those data have not yet been fully coded. We are still missing a good chunk of the literature necessary for a meta-analysis, so everything presented here should be considered preliminary and incomplete (see the conclusion for more discussion).

<u>What Is Being Published and Where?</u>

Figure 2 lays out the count of articles that we have amassed to date by publication outlet. As should be expected since the journal began almost 40 years before *JPSE*, *PS* has published the most pieces about teaching research methods, followed by *JPSE*.[4] Other outlets include JPAE, book chapters, and an assortment of other disciplinary and non-disciplinary but related sub-field journals (see Appendix A for the full listing).

Over time, the volume of what is being published has significantly increased, though in recent years the annual count of related publications changes. These counts are laid out in Figure 3 over time from 1991 to 2019 and summarized in Table 1. We have broken the publications out into 4 overlapping categories: total publications per year (noted as Count on the figure), the total per year without TLC track summaries (CountNOTrackSumm), the total count without book chapters (CountNOBookChapters), and the total count without TLC track summaries or book chapters (CountNOBCTS). We do this because the track summaries are reports on themes, not actual findings, and account for about a dozen of the total sample, and some of the periodic spikes we see in counts are really driven by the publication of books that include several chapters related to teaching research methods (e.g., Ishiyama et al 2015). For each year and each category of count, the minimum, maximum, and median counts are the same—0, 7, and 2 respectively. The mean count changes by category, however. For all, the mean count is 2.5 per year and for the count without the TLC track summaries nor the book chapters the mean count goes down to 1.9 per year. But overall the numbers of articles are trending up over time.

What is being written about is captured in the Focus variable on Table 1. This is broken into seven primary areas: 1) class approach (things like active learning versus problem-based learning); 2) conceptual approach (information literacy, writing, critical thinking; 3) scope and

[4] Note that the number of research methods articles coming out of *PS* is likely to be low, as they began publishing in the late 1960s but our review of the literature does not begin until 1991.

field reviews; 4) teaching quantitative approaches; 5) teaching tools (books, software, etc.); 6) student psychological factors (math phobia, efficacy); and 7) track summaries. Among these, the most frequent are class approach, followed by scope and field reviews and then quantitative methods.

By Whom?

We also examined who is writing about teaching research methods—these variables are captured in Table 2. A small majority of the authors are female (as the lead author), associate professors, and from PhD granting universities. The number of authors range from 1 to 4, and most have two co-authors. Note that all of this information is collected and coded for the year of the publication.

We also examined relationships between author characteristics (captured on Table 3). There are very few statistically significant relationships, though the ones we do find are quite interesting. First, male authors are more likely than female authors to write alone, and female authors are most likely to write with one other female (analysis not shown). There are a surprising number of graduate students who are first author—and usually in these cases there are more authors and they are from PhD granting institutions.

What Is the Evidence Base?

Based on our first review of the data, we find little true SoTL research about teaching research methods, and the research that that falls in this category does not begin to be published until 2008, showing up sporadically after that point. While impossible to establish actual causality from this analysis, that the timing of the first true SoTL research coincides proximately after the advent of the TLC making it is safe to assume that this body of knowledge is a direct result of APSA's TLC.

The research type (think design with an overlay of pedagogy) and analytic approach taken in these pieces varies. Most of the pieces are some kind of review of personal experience in the classroom or case study of an innovative teaching technique, usually often first person with some basic statistics about participation and teaching evaluations. SoTL and state of the field reviews follow this. In terms of analytic approach, most include some form of basic quantitative analysis, usually stopping at the level of bivariate analysis. There are very few true experiments. Of the quantitative studies, the sample sizes range from 5-450, with a median of 71 and a mean of 95. Focus and research tight are strongly largely because one of the substantive categories match. And there is a relationship between sample size and analytic approach—with the larger samples more able to support multivariate analysis.

Based on our analysis of bivariate relationships, we also attempted to model what may drive different design approaches to pedagogy research for methods in political science. Using the research type variable for our dependent variable and multinomial logistic regression analysis, we model the effects of quantitative versus all other types of analysis (collapsed from the analytic approach variable), number of authors, and year of publication, and institution type. The results can be found on Table 4, though note that the analysis is preliminary and there are problems with the model. If the results are to be believed, the effect of these variables can be seen mostly on the category of reports on personal experience, which are less likely to use any quantitative analysis, have fewer authors, consist of earlier pieces, and are more likely to be written by authors not from PhD granting institutions. We see moderate effects on increased numbers of co-authors for SoTL pieces, and increased number of authors on field review pieces and scholarly teaching pieces.

What Do We (Think We) Know?

Conclusions: Next Steps & How to Move Forward as a Field

In this paper, we take a first cut at examining 30 years of articles about teaching research methods in political science, relying on disciplinary and related journals and available book chapters. We have not yet included unpublished studies, nor have we completed an extensive review of book chapters. These pieces have been compiled to eventually develop a systematic review of findings in the field and a meta-analysis of similar studies.

In this first cut of the available data, we think we know a few things. There is little rigorous study about teaching research methods even after over a decade of *JPSE* and 15 years of the APSA TLC. This is hardly surprising given how late political science as a discipline came to focusing in a serious way on pedagogy. However, it appears that the TLC is at least a proximate cause of more research in this area, spurred along by the creation of *JPSE*. Most of this work is being done by females as well as tenure track scholars. The number of publications from faculty in PhD granting institutions was surprising—though perhaps this reflects publication bias more so than interest from people in other types of institutions, as anecdotal evidence from attendance in teaching section panels at conferences would suggest. This is not to suggest that pedagogy outlets favor articles from PhD granting institutions, but rather these authors have more time in schedules to and likely more experience in navigating the peer review process and thus have more success in this area than scholars from non-PhD granting institutions.

Finally, there are several next steps in this project, and we lay them out here in the hopes that readers may be able to offer some contributions. These include:

1. Identifying other publications about teaching research methods in political science. These may come from:
    a. Other academic journals

    b. Edited volumes
    c. Books
2. Identifying other research done about teaching research methods in political science that have not been published. These may come from:
    a. Manuscripts that have been submitted but were rejected or received a revise and resubmit which was never completed
    b. Manuscripts and conference papers that have not been submitted but are complete (these may be identifiable from conference proceedings)
3. Coding and analysis of these additional articles for themes similar to those presented in this paper (see State of Knowledge of the Field discussed above).
4. Identify common questions among the quantitative studies to develop a meta-analysis from the available data.

All of this work is on-going, but to the extent that readers can assist with any of this, especially steps 1 and 2, we encourage them to reach out to us.

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Figure 1. New Pedagogy Journals

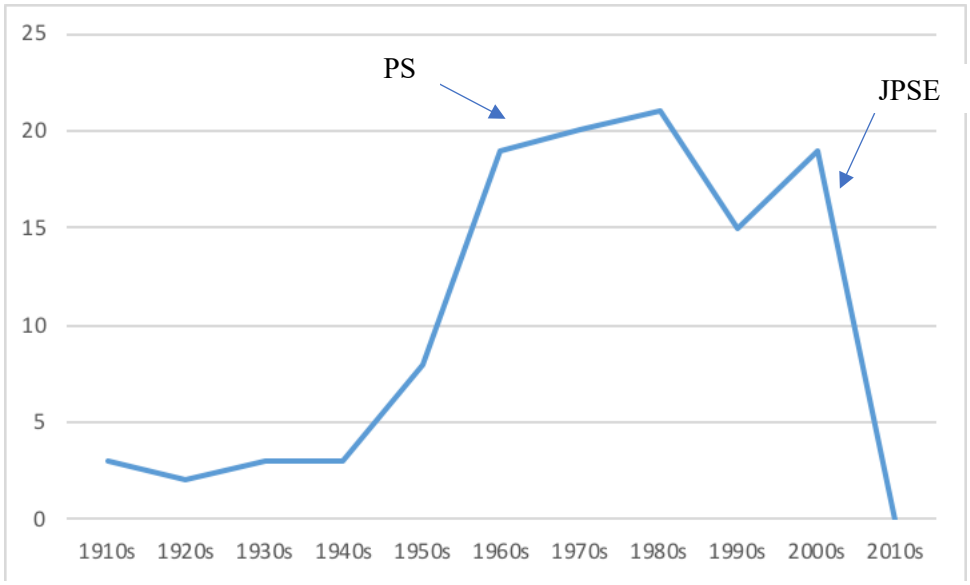

Figure 2. Articles by Outlet

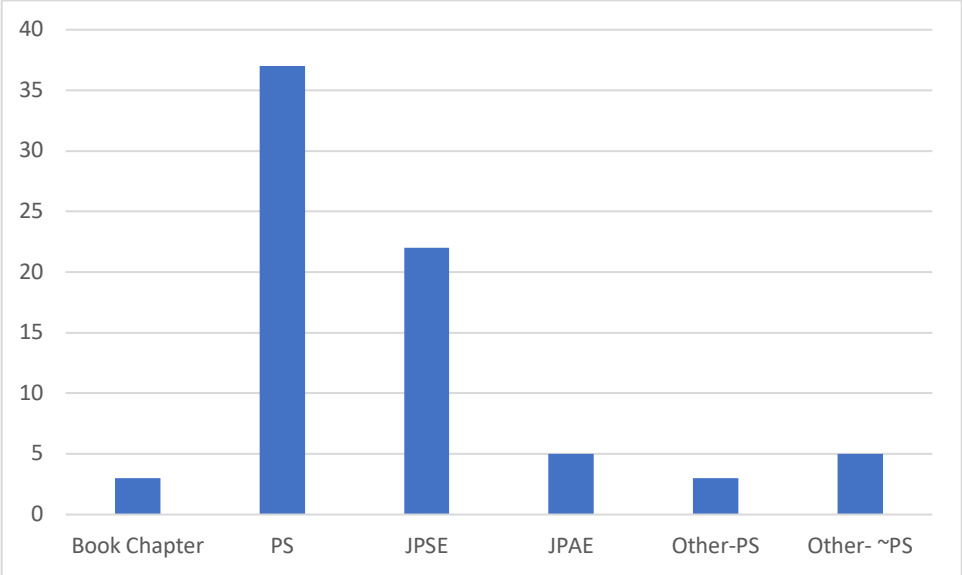

Figure 3. Articles over Time

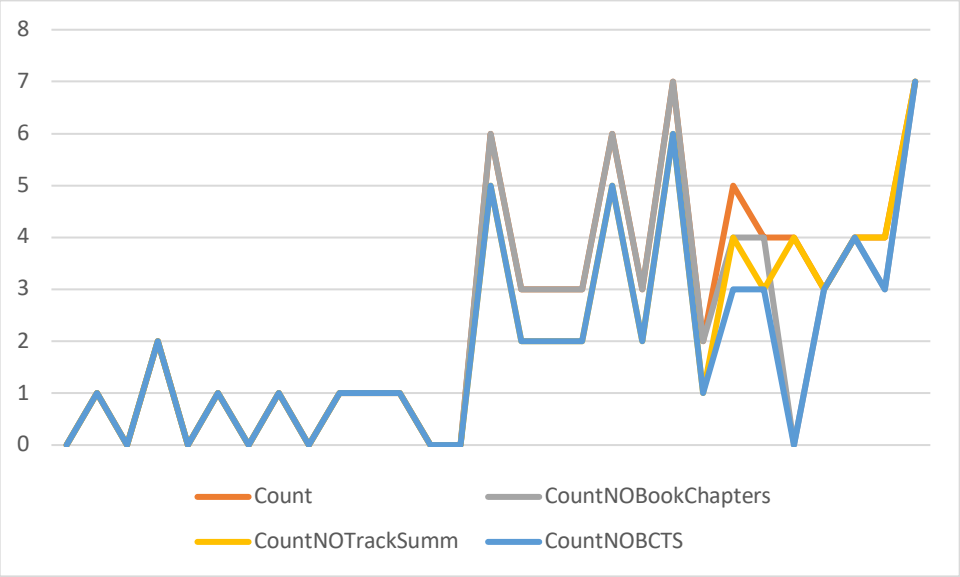

Table 1. Descriptive Overview of Article Research Approach

Variable	Measure of Dispersion		Measure of Central Tendency
Publications per Year	Range	0-7	Median = 2 Mean= 2.5
Focus	Class approach	24.3%	
	Conceptual approach	12.2%	Mode= classroom approach
	Scope/field	20.3%	
	Quantitative methods	16.2%	
	Tools	5.4%	
	Student development	8.1%	
	Track summaries	13.5%	
Research Type	SoTL	18.9%	
	Personal experience	21.6%	Bi-modal= personal experience AND innovative technique
	Innovative technique	21.6%	
	Scholarly teaching	9.8%	
	State of the field review	17.6%	
	Other	13.7%	
Analytic Approach	Non-analytical	12.2%	
	Qualitative	12.2%	Mode= non-experimental statistical analysis up to the examination of bivariate relationships
	Mixed methods	12.2%	
	Non-experimental	2.4%	
	• descriptive stats	9.8%	
	• bivariate	17.1%	
	• multivariate	4.9%	
	Quasi-experimental	2.4%	
	Experimental	4.9%	
Sample Size	Range	5-450	Median = 71 Mean = 95 St. Dev. = 97.8

Table 2. Descriptive Overview of Author Information

Variable	Measure of Dispersion		Measure of Central Tendency
Number of Authors	Range	1-4	Median = 2
Gender (Lead Author)	Male	45.9%	Mode = Female
	Female	54.1%	
Rank (Lead Author)	Undergraduate	1.8%	
	Graduate	1.8%	Mode = Associate Professor
	Research Fellow	7.0%	
	Assistant Professor	31.5%	
	Associate Professor	35.1%	
	Professor (40)	24.6%	
Institution Type (Lead Author)	High School	0%	
	Community College	1.4%	Mode = PhD Granting Institution
	BA/BS	8.1%	
	MA	6.8%	
	PhD	56.8%	
	Unable to Determine	27.0%	

Table 3. Bivariate Relationships between Author Characteristics and Analytic Approach

Variable 1	by Variable 2	Statistic
Gender	Rank	$\chi^2 = 5.047$
	Institution	$\chi^2 = 5.176$
	Number of authors	$\chi^2 = 15.472$***
	Year	$F = 0.010$
	Research Type	$\chi^2 = 0.196$
	n	$F = 0.430$
	Focus	$\chi^2 = 9.039$
Rank	Number of authors	$\chi^2 = 11.752$
	Institution	$\chi^2 = 21.148$
	n	$F = 0.63$
	Focus	$\chi^2 = 27.009$
Analytic Approach	Gender	$\chi^2 = 8.137$
	Rank	$\chi^2 = 32.258$
	Institution	$\chi^2 = 12.421$
	Number of authors	$\chi^2 = 18.062$
	Year	$F = 1.820$
	Research Type	$\chi^2 = 54.692$
	n	$F = 4.24$**
	Focus	$\chi^2 = 42.387$
Research Type	Gender	$\chi^2 = 8.196$
	Rank	$\chi^2 = 20.076$
	Institution	$\chi^2 = 17.528$
	Number of authors	$\chi^2 = 24.957$*
	Year	$F = 0.61$
	n	$F = 2.12$
	Focus	$\chi^2 = 46.918$***

* significant at p<.05
** significant at p<.01
*** significant at p<.001

Table 4. Multinomial Analysis of Research Type for Teaching Methods

Category	Variables	Coefficients
SoTL Research	Quantitative analysis	0.024 (1.067)
	Number of authors	1.045 (0.788)*
	Year published	0.112 (0.090)
	Institution	-0.186 (0.721)
	Constant	-226.567 (182.072)
Reports on Personal Experience	Quantitative analysis	-4.551 (1.931)***
	Number of authors	-6.132 (3.534)**
	Year published	-0.152 (0.119)*
	Institution	-2.799 (1.742)*
	Constant	325.241 (243.368)*
Scholarly Teaching	Quantitative analysis	0.516 (1.450)
	Number of authors	0.976 (0.906)
	Year published	-0.013 (0.078)
	Institution	-0.076 (0.896)
	Constant	24.449 (157.215)
State of the Field Reviews	Quantitative analysis	1.266 (1.411)
	Number of authors	1.789 (0.787)**
	Year published	0.035 (0.077)
	Institution	0.220 (0.822)
	Constant	-74.931 (154.606)

n = 52
Chi-2 = 46.46 $p<0.001$
Pseudo R2 = 0.254
Base outcome = Innovative teaching

* significant at $p<.10$ using a one-tailed test
** significant at $p<.05$ using a one-tailed test
*** significant at $p<.01$ using a one-tailed test

Appendix A: Listing of Articles

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