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Editors' Introduction to the Thematic Issue: Mad about Methods? Teaching Research Methods in Political Science

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Introduction

Research methods are to a political scientist what a hammer is to a carpenter (Hewitt 2001). It is the main instrument by which we perform our profession. In conventional curricula, the majority of courses seek to promote the transfer of knowledge from professor to student. The challenges in teaching research methods are therefore somewhat different than many other courses in the curriculum. To quote Hewitt: "While there are some carpenters who do excellent work without ever touching a hammer, most carpenters need adequate hammering skills in order to complete their work" (2001, 371). In other words, students need to develop the necessary skills to correctly apply research methods. This implies a different educational practice.

The contributors to this special issue all seek to address the challenge of teaching research methods to political science students. This introduction aims to provide a concise framework for the various innovations presented throughout this issue, situating them in the wider literature. Particular emphasis is placed on the factors that distinguish the teaching of research methods from other subjects in the political science curriculum, that is, it revolves around the acquisition of a skill rather than knowledge. Over the last decade, a large body of literature emerged identifying the challenges associated with methods instruction that provides various tools to help overcoming such challenges (see, e.g., Kilburn, Nind, and Wiles 2014; Wagner, Garner, and Kawulich 2011).

Our review is structured along three different dimensions of the teaching/learning process: the role of the student, the role of the professor, and the context in which learning takes place. For each of these, we highlight a number of factors that can enable (or constrain) the effective learning of research methods.

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Where possible, we refrain from distinguishing between quantitative and qualitative research methods and instead focus on the communalities.

The Student—Practice Makes Perfect

"Practice makes perfect" is a particularly potent guideline when learning research methods for two reasons. Firstly, it refers to the idea of practice by doing and active learning. By repeatedly applying research methods, students can master (component) skills. Secondly, there is the notion of learning from ones' mistake that enables a student to hone his or her skills due to iterations of trial and error. We discuss each in greater detail.

Practice by Doing

The simplest way to make students practice is repetition. Repetition largely affects learning through fostering automaticity. *Automaticity* implies that a set of skills and knowledge has become readily available to someone and are activated without any major mental effort. As Brown and Bennett argue: "Automatization occurs because the task is so well-practiced that many of its components become automatic and drop out of conscious awareness, thereby reducing capacity demands" (2002, 81). Moreover, the availability of such skills and knowledge at low mental cost enables students to dedicate their mental capacity to more complex issues, either of methodological or substantive nature. A novice first needs to invest in acquiring such automaticity before any movement in the direction of more complex analysis can be made.

When the purpose is to develop an ever-wider set of methodological skills and knowledge with an increasing level of complexity, "mindless repetition" will not suffice. Methods are not motoric skills—like riding a bike or driving a car—but rather require constant adaptation to the research question and research context. Consequently, there is a need for an analytical understanding of methodological processes. It is in students' interest to concentrate "on actively trying to go beyond their current abilities" rather than engaging in "mindless repetition" (Ericsson 2002, 29). Or as Touchton (this issue) emphasizes: "[S]tudents acquire useful skills through application—not memorization and regurgitation" (28). Automaticity as it emerges from repetition may be a double-edged sword. It facilitates the ready use of a set of skills and knowledge but can also significantly hamper further development (Ericsson 2008, 991). With an eye on the mastery of ever more complex skills, a new approach emerged that stresses specially designed training activities known as *deliberate practice* (Ericsson, Krampe, and Tesch-Römer 1993, 368). Deliberate practice is different from mere participation in domain-related activities, due to its design's explicit focus on improving performance. Through instruction in a flipped classroom,[1] Touchton is able to provide such goal-directed practice a traditional class may not provide. Deliberate practice is, however, still very much a teacher-centric approach to learning.

Experiential learning, by contrast, stresses learning on the basis of students' own experiences with the subject. It relies on a constructivist notion of learning, which places high value on facilitating students' acquisition of deep-level knowledge and skills via student-centered learning. Knowledge, according to this notion, should be actively constructed, rather than being idly transmitted (Barraket 2005). Students then become "the key initiators and architects of their own learning and knowledge-making, rather than passive 'vessels' who receive the transmission of knowledge

from 'expert' teachers" (Barraket 2005, 65). In this way, students "are encouraged to internalize and understand the subject being studied" (Benson and Blackman 2003, 47). As Hopkinson and Hogg (2004) observe, this is particularly rewarding with respect to research methods teaching. By letting students experience the different stages of qualitative research themselves; they could identify challenges with the collection, coding (categorizing), and analysis of the data. Moreover, students emphasized that many issues dealt with in readings and lectures only became meaningful upon experience (Hopkinson and Hogg 2004, 313–315). In the scholarship on teaching and learning, various scholars have emphasized the "research-teaching" nexus as a key factor that can enable students to practice doing in methods courses (see, e.g., Bell n.d.; Leston-Bandeira 2013; Lundahl 2008; Ryan et al. 2014). But also when mastering statistical techniques, experiential learning can be pursued. Through the use of Monte Carlo replications, Carsey and Harden (this issue) show how students can run experiments on their data and experience the limitations of statistical techniques.

Learning from Mistakes

Applying research methods inevitably involves trial and error. For mistakes to result in learning, *feedback* is essential. As Ericsson claims:

> A century of laboratory research has revealed that learning is most effective when it includes focused goals, such as improving a specific aspect of performance; feedback that compares the actual to the desired performance; and opportunities for repetition, so the desired level of performance can be achieved. (2002, 27)

It is thus the quality (progression in complexity and feedback) and quantity (the amount) of practice that determines the extent of performance improvement. Keeping in mind that the learning of research methods is about applying knowledge rather than merely retaining it, practitioners advocate *continual assessment* via applied coursework (Edwards and Thatcher 2004, 200–201). One of the advantages of teaching research methods through a flipped classroom is the ability to provide frequent and immediate feedback to students while they are practicing (Touchton, this issue). Initially, students may not able to identify errors, let alone engage in new attempts aimed at remedying them. Once skills and knowledge are being developed, however, learners become more able to identify the errors themselves (Ericsson 2008, 991). At this stage, *peer assessment* can be an additional way to learn from (others') mistakes. Feedback from peers can be organized via written academic style reviews (Cho and Schunn 2007), group discussions (Mevarech and Kramarski 1997), or even in a context of blended learning (Leston-Bandeira 2013). Regardless of the (variety of) channels through which feedback is provided, what remains crucial is that students have sufficient opportunities to reflect on the potential weaknesses in their training.

The Professor—Kindling the Fire

For students to perform the role of an actively engaged learner, the professor should be a mentor who stimulates the learning process. While there are many hurdles in taking on the role of a mentor, three particular challenges professors face are worthwhile addressing when teaching research skills. First and foremost, students are not keen

on learning research methods. Hence, to motivate students, one must link methods education to students' sphere of interest. Secondly, to attain research skills, students often require mastery of a range of secondary skills. For example, to conduct a regression analysis, students need computer skills and knowledge of (statistical) software packages, while qualitative interviews require that they ideally dispose of adequate verbal and social skills. Providing ample support is therefore vital to ensure that learning takes place. Finally, as research methods lay beyond student's topical interests, dispositional factors can have a relatively large impact on students' ability to learn in comparison to other courses. In the following subsections, we point to several good practices addressing these three challenges, which in turn may help professors in fostering the learning process.

Piquing Students' Interest

One of the main challenges in teaching research methods to political science students is their lack of interest. Ideally, we expect students to have a knack for politics, but this does not imply they immediately see the added value of research methods. As Benson and Blackman (2003) bluntly asked: "Can research methods ever be interesting?"

The most straightforward approach to tie in students' spheres of interest is to clarify theory by using *enticing examples*. Several approaches to achieve this goal can be distinguished. The most straightforward way is drawing from actual research. Many of the common textbooks used to instruct research methods to political science students already seek to incorporate practical examples.

However, the examples should be chosen with caution. Cassese, Holman, Schneider, and Bos (this issue), for example, convincingly show that most of the methods handbooks eschew gender-related topics, which may estrange a part of the student audience. Moreover, political science, as a discipline, is quite diverse and not all students are equally interested in each subdiscipline. This renders the class' interests quite heterogeneous. It is clear that this constrains the professor's ability to motivate the entire student group (see *infra*). An alternative source of examples is popular media. Burkley and Burkley (2009), for example, used excerpts from the television show *Mythbusters* as teaching material to discuss the research design applied in these various cases. It is also possible to move one step further by having students formulate their own questions as starting point for active learning. Mark Rom's contribution to this issue serves as a good example of this technique.

In addition to the integration of interesting examples in methods courses, others suggest to integrate methods in nonmethodological courses (Adriaensen, Coremans, and Kerremans 2014; Cassese et al. this issue; Markham 1991; Slootmaeckers, Kerremans, and Adriaensen 2014). In nonmethodological courses, students generally participate because of their substantive interest. The potential for applications that fit with students' sphere of interests might be far greater in these courses. Moreover, the introduction of methods in nonmethodological courses helps to support the idea that methods are germane to the political science discipline.

Supporting Learning

The application of research methods often requires student familiarity with various software packages or tools. For this purpose, additional support might also be required. Ransford and Butler (1982) were among the first to acknowledge this need as they attributed great importance to familiarizing students with the use of punch

cards. Nowadays, the available soft- and hardware has become more user friendly and the current generation of students is often considered digitally native. Nevertheless, it would be a folly to assume additional support is not required when students work with research software. Flipping the classroom is only one way to provide such support (Touchton, this issue). Support can then be provided where needed the most, that is, at the stage when students are applying the methods, not while learning the theory. Mark Carl Rom (this issue) also points to the importance of developing broader problem-solving strategies (using search engines, manuals, and so forth) that enable students to deal with software-related challenges. This way, students apprehend that mastering a software package is often a trial-and-error prone process, not alien to the experienced researcher.

In summary, for the teaching of research methods, professors need to be sensitive to students' skill sets and should be able to identify the type of (additional) support required.

Dispositional Factors

An important factor to stimulate learning is students' attitudes towards the subject. In addition to students' interests (cf., *supra*), professors should also be concerned with the existence and gravity of methods anxiety. Of particular concern here are statistics and computer anxiety.

Statistics anxiety refers to students' fear and discomfort to work with quantitative data and characterizes many students' predisposition regarding a methods course (Buchler 2009; Onwuegbuzie and Wilson 2003). Such an anxiety is not completely harmless as it has been shown to affect students' performance on tests as well as their long-term retention (Onwuegbuzie and Wilson 2003; Slootmaeckers, Kerremans, and Adriaensen 2014). Fortunately, the methods to overcome such anxiety are strongly related to the educational practices discussed above, that is, repeated hands-on experiences, the provision of adequate support, and the emphasis on research methods as a tool to answer pertinent questions (Adeney and Carey 2011; Buchler 2009; Lewis-Beck 2001). Alternatively, *computer anxiety* plays a role in particular with respect to the use of supporting software to execute the aspired analyses (Hsu, Wang, and Chiu 2009). The ability to flip the classroom or to provide sufficient support during lab sessions can address already a large part of the problem (Bolin et al. 2012). Both Carsey and Harden (this issue) as well as Rom (this issue) provide students with the basic R codes to perform Monte Carlo replications and to construct graphs, respectively, in order to provide students a more productive rather than frustrating experience with the program.

Lecturers should recognize that the existence of anxieties among students heightens the need for additional support and carefully crafted learning material. *Stereotype threat*, which reinforces such anxieties, is of particular concern here. "Stereotype threat is a psychological process where group members experience anxiety in response to stereotypes about a group-based deficiency in a particular academic domain" (Cassese et al. this issue, 63). For quantitative methods, this particularly affects the female student population. By mainstreaming gender in methods courses, this stereotype threat can be diminished, which ultimately helps improve the performance of female political science students (Cassese et al. this issue).

Increased attention is also necessary to ensure proposed innovations act as a stepping stone not as a stumbling block for students' learning experience. For that purpose, in developing a research methods course, scholars have emphasized that the ordering of qualitative techniques before quantitative methods can also help reduce students' anxiety of methods (Bernstein and Allen 2013). To improve *self-efficacy*, Murphy (this issue) promotes the use of older student research reports as teaching examples instead of the typical polished and published research articles. This provides students a more realistic view of what is expected of them. Mark Rom (this issue) also emphasized that the lecturer does not have to be flawless and all-knowing. By showing students that also experienced researchers can be seriously challenged by their data or the software required to visualize it, students feel less disheartened by their own setbacks in conducting research. As he indicated: "We are all in this together" (14).

The Context

Most of the studies propagating specific techniques to foster the learning of research methods have been developed, applied and tested in a particular context. Whereas the ideographic account of many teaching and learning publications acknowledges such context specificity, it also raises questions regarding the transferability of the proposed educational innovation to alternative environments. We therefore attribute our third section to the discussion on how the context can constrain the scope for innovative teaching methods and how to cope with these constraints. Building on our own experiences and drawing insights from the broader literature, we focus on two particular constraints imposed by the class context. These concern the size of the class on the one hand and the heterogeneity of the student population on the other hand.

Class Context

Group size largely constrains the lecturer's ability to activate students and to foster participation (Pollock, Hamann, and Wilson 2011). Most of the innovations in this special issue are limited to relatively small groups of students. This confirms earlier findings that the average research methods class in an American political science program contains 29 students (Turner and Thies 2009). In the European context where class sizes of 300 and more are no exception, the feasibility of various innovations somewhat wanes. To ensure active participation by students alternative approaches are forwarded. One method is the organization of supplementary sessions. Combining large-class lectures with seminars organized for smaller groups has been shown to achieve similar levels of participation (Crull and Collins 2004; Gordon, Barnes, and Martin 2009). An alternative approach to foster active participation in large student groups is the use of Student Response Systems (clickers) (Evans 2012). Aided by the shroud of anonymity, the lecturer is able to activate a larger group of students into participating (Morling et al. 2008). The fact that the acquired data can be used and analyzed in class is an additional advantage for the teaching of (quantitative) research methods (Wit 2003). Yet another method to deal with growing class sizes is by offering (sections of) the class online. While it might accommodate the workload, it also heightens the educational challenge of attaining effective learning as success in online courses requires greater student engagement (Roberts this issue).

A second important constraint imposed by the class context is the *heterogeneity among students*. Such heterogeneity comes in two, often overlapping, forms. Heterogeneity can arise due to the variety of majors within the student population, or as a consequence of varying capacity and skills levels of students. This constrains professors' ability to tap into students' sphere of interests. To manage a divergent heterogeneity in terms of skills, Mevarech and Kramarski (1997; Kramarski and Mevarech 2003) suggest teaching research methods using cooperative student groups. Crucial here is the development of students' metacognitive skills. Presence of such skills enables the heterogeneity to be harnessed enhancing the group's learning experience.

Limitations Imposed by Program or Faculty

Besides the class context, the program or the wider faculty can also impose constraints on the applicability of certain innovations discussed above. The organization of seminars or the replication of a course for smaller groups implies the availability of a team of devoted teaching assistants. The financial and human resources required often acts as a stringent constraint. When the room for maneuver is limited, one has to think outside the box. One particular innovation in teaching research methods concerns course crossover approaches (Dickovick 2009; Markham 1991). By integrating research methods in nonmethodological courses, one can create repeated learning opportunities while obtaining a better match between the methods and students topical interests. Moreover, students will encounter research methods in a context that is often more malleable to learning (smaller, more homogeneous groups). One can push this idea further by systematically integrating (quantitative) research methods within multiple nonmethodological courses across the program (Adriaensen, Coremans, and Kerremans 2014; Howery and Rodriguez 2006). A similar course-crossover approach has been used successfully to impart information literacy within political science students (Marfleet and Dille 2005).

However, some of the innovations suggested above could still be useful when teaching large groups of students. For example, one can partly shift the burden of grading and feedback of written assignment to the students by using peer-feedback techniques. By asking students to revise each other's papers, by providing peer feedback, or by promoting group evaluations, one can still work with written assignments, discussion, and debates without the need of a large teaching staff overviewing the entire process (Cho and Schunn 2007). Likewise, experiential learning and deliberate practice can also be applied in larger classroom settings through the use of group projects (Longmore, Dunn, and Jarboe 1996).

To cope with another common challenge—that is, financial constraints—alternative low-cost options are also being developed. To circumvent, for example, the costs of buying a clicker system for all students or asking students to buy it themselves, new apps are currently available that enable students to participate with their own smartphone devices (see, e.g., Socrative, Cahoot, or Infuse Learning).[2]

Through this introduction we hope to have shown that there are multiple ways to foster the teaching and learning of research methods in political science majors. And while recognizing that the context can severely constrain a simple implementation, with the necessary creativity, one can easily overcome such challenges.

Overview of the Issue

This collection is comprised of six studies. In the first contribution, Mark Carl Rom presents the experiences with his course "Numbers, Pictures, and Data." In his article,

he lays down the rationale for developing a course around data visualizations, elaborates the design of his course and touches upon the various challenges encountered (both for the student as well as the lecturer). His experiences show the potential value of such a novel design as an alternative or complement to standard methodology courses.

The motivation to grant students sufficient opportunities to actively practice and use methods stimulated Touchton into flipping his classroom. This method of instruction asks students to study the course material at home through online lectures while providing in-class support when students are practicing the methods. Through a quasi-experiment, he shows that students' performance and attitudes are improved by "flipped instruction." Roberts also contributes to this discussion by studying the effects of offering sections of a course fully online through lecture capture on academic performance and completion rates. His findings suggest that performance and completion rates are only slightly smaller in case of online lectures. The main challenge, he concludes, will be to foster greater student engagement.

The contribution by Cassese, Holman, Schneider, and Bos problematizes the lack of overlap between the political science curricula on methodology and gender politics through an assessment of the most commonly used textbooks. The lack of gender-related content, they argue, reinforces stereotype threat and diminishes student engagement. In their article, various tools are presented that can help bridge the gap between gender and methodology. Murphy's contribution also seeks to address the dispositional factors that impede effective learning. The target of his innovation is students' lack of confidence in their abilities. Instead of using academic articles and textbooks as study material, he uses papers written by former students as exemplars in an effort to align students' and lecturers' expectations regarding the desired quality of output. The final contribution by Carsey and Harden focuses explicitly on the teaching of quantitative methods. They advocate the use of simulations in R as a method to let students 'experience' the statistical techniques they are being taught. Simulations allow students to manipulate the data generating process that underlies each dataset. Through experimentation, they can thus assess the consequences of a violation of one or more key assumptions of a specific estimation model.

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Notes

1. A flipped classroom is one where students process the course material that is traditionally delivered in a class- setting (lectures, presentations) at home while working on problem sets and research papers (which are traditionally part of homework) in class.

2. For more information see the following: http://www.socrative.com/; http://www.cahootlearning.com/; http://www.infuselearning.com/, respectively.

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