



Taskforce on Technological Innovation in Political Science



APSA Taskforce on Technological Innovation in Political Science



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CONTENTS

Part I: Executive Summary.....	1
Part II: Detailed Subcommittee Reports.....	2
1. Academic Public Goods.....	2
Omar Wasow, Justin Grimmer, and John Sides	
2. Teaching	3
Renée Van Vechten and Toni Pole	
3. Textual Analysis/Language Translation	5
Melissa Williams and Darrell West	
4. Publishing.....	7
David McBride and David Mainwaring	
5. Data Capturing for Teaching and Research	10
Latanya Sweeney	
6. Survey of APSA Members Regarding Their Uses of Technology	11
Renée Van Vechten and Toni Pole	
Appendix.....	14

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Part I: Executive Summary

The American Political Science Association (APSA) Taskforce on Technological Innovation in Political Science conducted a series of meetings and conference calls to examine ways that APSA and its members can encourage technology innovations in teaching, research, and public outreach. The taskforce formed a set of subcommittees, and each group generated a number of ideas, which are briefly summarized in the following text. The taskforce also conducted a survey of APSA members regarding their technology use. Following these recommendations are longer subcommittee reports outlining the rationale for these recommendations.

1. Academic Common Goods

Create a call and award a monetary prize with a \$25,000 endowment focused on teaching innovations. In addition to a cash award, the prize should have a prestigious name such as the Elinor Ostrom Award; it should be widely publicized and the results broadly disseminated. Perhaps an APSA member committee should identify the problem to be solved that year, after which competitors would submit proposed solutions. Then, the committee determines the prize winner.

2. Teaching

- Centralize teaching and learning resources on the [APSA website home page](#) in one main tab with a pull-down menu.
- Create a peer-reviewed teaching resources library that is accessible through APSAnet, modeled on the [Teaching Resources and Innovations Library for Sociology](#) (TRAILS) site at the American Sociological Association or [Multimedia Educational Resource for Learning and Online Teaching](#) (MERLOT) by the California State University system, including a repository of images that professors could use, free of charge, in their instructional materials.
- Partner with existing centers for teaching and learning to enable APSA members' access to their content and/or enable political science educators to earn "Teaching Certificates" through these institutions.

3. Textual Analysis/Language Translation

- APSA should create or facilitate platforms for
- text mining, for example, of "canonical" texts in the history of political thought, the writings and speeches of political figures, or textual production of broader public spheres;
 - techniques by which large-n data are converted into visual representations of patterns that human interpreters of texts and contexts might otherwise overlook;

- "crowd sourcing," or harnessing energy and local knowledge of technologically enabled social networks of scholars, citizen activists, and government agencies to generate new knowledge;
- machine translation to produce new databases that could be analyzed using both digital and conventional methods.

4. Publishing

- Create a preprint server in which peer-reviewed analyses appear before print publication (this can be expensive).
- Because books are developing online platforms, develop a better system for alerting people to the publication of a book of particular interest to them
- Host a keyword-searchable table of contents for a wide array of journals, arguably including some outside political science.

5. Data Capturing for Teaching and Research

- Create a permanent online archive of temporal data for researchers.
- Develop a "Forever Data" website.
- Tailor content for APSA members.

6. Resource Considerations for APSA

- Fund-raising, with naming opportunity, for prize;
- Private sector partnerships or grants from Google/Facebook, or other big-data sources (especially those with political scientists on staff);
- Share resources with other associations (e.g., join in TRAILS; connect with International Studies Association with its 7,000 members);
- Pool resources with educational institutions (e.g., around teaching and software development).

7. Specific Suggestions Based on the APSA Member Survey

- Create an online, peer-reviewed library to centralize teaching resources.
- Pursuant to creating a library of resources, develop a more accessible, reviewable, updatable, well-organized syllabi repository.
- Develop and deliver a series of continual, online workshops regarding teaching/pedagogy independent of the annual APSA Teaching and Learning Conference.
- Pursuant to creating a library of resources, curate a collection of internship-related materials that would be of particular interest to faculty in BA- and MA-granting programs.
- Develop online course resources that would particularly benefit faculty in AA- and MA-granting programs.

Part II: Detailed Subcommittee Reports

1. ACADEMIC PUBLIC GOODS

Omar Wasow, Justin Grimmer, and John Sides

Background

In the book *The Machine that Changed the World*, Womack, Jones, and Roos, identify three phases of automobile production: craft, mass, and lean. The craft or guild model required lots of experts who handmade each part. The great disadvantage of this approach was that it demanded highly skilled artisans and every part was slightly different. The mass or assembly-line approach pioneered by Ford no longer required experts to assemble a car but often sacrificed quality and required expert craftspeople to fix glitches that were incorporated along the line. The lean process pioneered by Toyota also used an assembly line but invited any lineworker to stop the assembly line if he or she noticed a problem. At first this process was enormously expensive (the entire assembly line is halted) but, over time, the number of problems diminished dramatically. Moreover, by eliminating problems upstream in the production process, few problems required fixing after a car came off the assembly line.

Although automobile production might seem a far cry from education, the reality is that much of the academy operates under a guild model that has changed little in centuries. Each university course is taught by a highly trained expert who is expected to hand chisel the syllabi, assignments, exams, and so on. As a result, even for fairly standardized introductory classes, enormous variation in content and quality exists. Textbook manufacturers take on some of the work of standardizing courses and related materials. In general, however, there is a lot of duplicated effort by faculty, wasting valuable time and resulting in lower-quality educational experiences for students.

In the past, the guild model might have been the best way to produce and distribute academic knowledge. In *The Wealth of Networks*, Yochai Benkler argues that, until very recently, big collaborative projects typically required the involvement of a large corporation or government. Now, with the growth of the Internet, massive, cooperative, nonmarket, and nonproprietary endeavors are possible and increasingly common. Open-source projects such as Linux and collaboratively created web sites such as Wikipedia are leading indicators of this trend.

In the academy, a few successes such as the rise of open source statistical software show the potential of creating academic public goods. Overall, however, this

coordinated pooling of effort to create shared resources is seriously undersupplied. For example, if better resources were available, many more courses might rely on open-source textbooks, interactive simulations, and relevant video modules. In addition, to the extent shared resources are available, they are often static (e.g., a PDF or YouTube video) and do not get better as more people use them (e.g., Wikipedia). Ideally, pooled resources would improve as additional users provided corrections, debugged programs, expanded details, and so on.

Why academic public goods are undersupplied is unclear. Educational media and digital resources typically demand high fixed costs to create the first copy, hence the heavy reliance of university instructors on textbooks and their suppliers. After they are created, however, these educational resources usually require only marginal costs to produce additional copies. For example, to create a single high-quality video might be expensive but, after it is made, it can be shared widely for a very low cost. This illustration suggests that academic public goods may suffer from a collective action problem in which many would benefit from greater production but the initial costs are prohibitive.

Prizes as One Solution

How might this collective action problem in academic public goods be addressed? One possibility is through the use of prizes. Chari, Golosov, and Tsyvinski (2009) suggest that two kinds of incentives are common to encourage innovation: patents and prizes. Patents offer the possibility of a financial return for creating novel goods by granting a form of private ownership over an idea. Prizes, by contrast, can “reward innovators while making the fruits of the innovation public.”

Although numerous prizes are awarded under the aegis of APSA and the various organized sections, these prizes generally recognize scholarship such as the best paper on a topic. There does not appear to be a category of awards focused on recognizing public goods contributions, such as creating an exceptional data set or the developing and sharing superb materials for a course.

To address this omission and encourage greater production of academic public goods in political science, we propose a set of prizes recognizing contributions that meet these two criteria:

- A public good: the resource should be “open” or subject to only a limited set of legal restrictions so that it can be used widely and/or modified, edited, improved,

... the reality is that much of the academy operates under a guild model that has changed little in centuries.

debugged, translated into other languages, and so on.

- An academic contribution: the resource should improve our knowledge about the world (e.g., facts such as a data set), enhance our ability to interpret knowledge (e.g., tools such as a statistical package), or enrich our ability to communicate knowledge to students (e.g., textbooks, course materials).

At the outset, we do not imagine that the contribution would need to be technology specific. Rather, we would look to recognize contributions with potentially broad benefit to the discipline irrespective of the medium or form.

To start this initiative, we propose a set of APSA public goods awards that could recognize categories such as:

- data set of the year
- online course of the year
- interactive explanation of the year
- software / package / platform of the year
- course of the year (which would require posting slides and code to be publicly available)

There might also be an open call for submissions outside these categories and to which a limited number of “Special Jury Prizes” could be awarded.

Conclusion

Setting up a set of prizes for public goods could be a low-cost way to encourage more high-quality contributions that broadly serve the discipline. A few outstanding administrative and logistical questions remain. First, without a public goods “subgroup” within APSA, how should juries or judging committees be selected and comprised? Second, we are proposing this launch with a focus on the reputational value of receiving a prize and no monetary reward, but, if funding were available at a later date, how would that be managed? Third, with the upcoming APSA 2017 Annual Meeting, what is an appropriate time frame for launching? Fourth, how might submissions and winners be presented online to increase awareness of the range and benefits of academic public goods? Finally, what limitations should we consider on the number or scope of prizes?

2. TEACHING

Renée Van Vechten and Toni Pole

Great instructors are made, not born. Given that 95% of political scientists teach (according to Bureau of Labor

Statistics, 2016), and in light of growing political, public, and internal pressures to deliver effective “best practices” that will result in well educated students, we know that high-quality teaching resources are indispensable today to the average political scientist.

However, instructional resources

available to political science professors vary widely among institutional settings; state-of-the-art teaching tools and support staffing, often made available to a campus community through a commonly titled “Center for Teaching and Learning,” do not exist every place where they are needed. APSA has an opportunity to help equalize access to critical teaching and learning (T&L) resources through its administrative capacity to collect, organize, mediate, disseminate, and fund the production of and access to materials. We propose a series of innovations or steps that APSA can take to address the instructional needs of a greater swath of the profession, including graduate students, adjuncts, and full-time faculty, whether they are employed in small, liberal arts institutions or heavily endowed R-1 universities.

Centralize teaching and learning resources in one main tab with a pull-down menu on the APSAnet home page.

RATIONALE: The current APSA website houses syllabi collections, lists of available teaching awards, and publications about T&L dispersed throughout the website and variously connected to different member sections. These materials and resources are difficult to uncover using the simple “search” function, and their discovery often requires prior knowledge of them. We suggest creating a tab on the APSAnet home page that would include links to teaching-related materials the taskforce has collectively discussed, such as:

- Syllabi collections
- Teaching video repositories or links to YouTube videos
- Lists of teaching awards, such as those awarded through APSA
- Field research materials
- APSA publications relating to the scholarship of teaching and learning (SoTL), including journals and APSA teaching-related books
- Links to new or innovative repositories of information or digital libraries.

Create a peer-reviewed teaching resources library that is accessible through APSAnet, modeled on the Teaching

We propose a series of innovations or steps that APSA can take to address the instructional needs of a greater swath of the profession . . .

Resources and Innovation Library for Sociology (TRAILS) site that was created and maintained for members of the American Sociological Association (ASA), and similar to Multimedia Educational Resource for Learning and Online Teaching (MERLOT) supported by the California State University system.

RATIONALE: TRAILS is a searchable, online database containing thousands of evidence-based, peer-reviewed teaching materials, a catalog that is continuously augmented by sociologists and ASA (member) editors. These include (and are not limited to) instructions for conducting in-class activities based on current events, case studies, video clips, or texts; lecture slides on specific topics; techniques for improving classroom interaction; assignments based on existing datasets; how-to guides for simulations and games; and syllabi. Each entry is categorized by subject area, and members submit materials for review with the intent to help students gain “new knowledge, abilities or attitudes” based on demonstrated learning (<https://trails.asanet.org/Pages/TDLContent.aspx>).

Whereas APSA members have specific venues through which to distribute discipline-specific resources, including the APSA Teaching and Learning Conference, panels at the APSA Annual Meeting, “The Teacher” section in PS: Political Science & Politics, and the Journal of Political Science Education, this library would complement existing scholarship by providing access to materials that are practical, vetted, and specific. By either recreating, leasing, or improving on the existing ASA TRAILS model, APSA would create a digital library of resources that are created, submitted, peer-reviewed, and then published online for easy access to members. Moreover, the library would be searchable by subject area, resource type, and course level. Like the ASA site, APSA members submit their materials to site editors for review and publication in the library. About 150 pieces are submitted annually to ASA, and the turnaround for these materials is approximately one month from submission to publication. Copyright laws are addressed through citation agreements.

A teaching innovation library could draw in new APSA members or entice them to remain members; currently, those political scientists whose primary focus is teaching and secondary focus is research will find it difficult to patch together a coherent set of political science-based materials, or would like to have access to a library on demand. ASA members who use the TRAILS site tend to be from teaching

colleges and universities, but free access to that site for all members would lead to increased use by those in R-1s. Accessibility could be rolled into membership dues, or be based on a fee-for-service, as ASA did in the past, with different levels for members, nonmembers, and departments.

Currently, according to the director of TRAILS (Margaret Vitullo), ASA would be willing

to lease their system to other professional academic associations such as APSA; however, the TRAILS technology relies on aging Sharepoint 2010 software that cannot accommodate videos and has been superseded by better systems, such as Drupal, a free, open-source software system. ASA is considering a redesign, and, if several associations joined the effort, the \$200,000–\$250,000 capital cost of rebuilding the platform could be more easily shared, whereas the end product would be branded for each association and would not be shared. Building a circuit for the sharing of materials could introduce subscription issues, and ASA is concerned with maintaining the integrity of its own library.

As of June 1, 2016, APSA directors and staff have communicated with the ASA director, TRAILS director, and staff to obtain basic information about the system and the possibilities for collaboration. ASA’s current plan is to recruit associations to this venture beginning in the fall 2016. We, the subcommittee on this taskforce, recommend that APSA actively pursue this endeavor.

Partner with existing Centers for Teaching and Learning to enable access to their content and/or enable political science educators to earn “Teaching Certificates” through these institutions.

RATIONALE: Many graduate students, adjuncts, and part-time and full-time faculty work in institutions that are underfunded or simply lack the resources to provide the technological tools to help them improve as educators. Among many objectives, professors may be searching for robust ways to better address inclusivity, revise their grading methods, or assess their learning outcomes more effectively. Campus-based T&L centers abound, but they are unevenly distributed among institutions, despite that many more persons could be benefiting from their resources if they are willing to share them. We propose that APSA explore the possibility of partnering with existing, campus-specific centers of excellence to enable APSA members to access otherwise exclusive types of resources, such as online workshops, short courses, and instructional videos, that

is, materials that could help them augment their teaching portfolios and excel as educators.

The following are examples of centers that currently contain a variety of materials dedicated to promoting excellence in teaching and learning:

- Brown University, Sheridan Center
- Cornell University, Center for Teaching Excellence
- Harvard University's Derek Bok Center
- Great Lakes College/ Global Liberal Arts Alliance, Consortium for Teaching & Learning
- Iowa State University, Center for Excellence in Learning and Teaching
- Massachusetts Institute of Technology, Teaching and Learning Laboratory
- University of Michigan, Center for Research on Teaching and Learning
- St. Olaf College, Center for Innovation in the Liberal Arts

We encourage APSA to partner or work with private educational resource services to obtain discounted subscription services to professional development applications or tools.

RATIONALE: As stated previously, professors working in underfunded institutions may need help accessing technological tools to help them improve or deliver content. For example, JSTOR is available to APSA members at a discounted rate. Professional development services are numerous; one example is "Monday Morning Mentors," 20-minute videos that address common classroom dilemmas; a link to the week's new video appears every Monday morning in the subscriber's inbox. Other common technological services could include Qualtrics survey software, Lynda.com training videos, or other high-demand online services that remain out-of-reach for some professors.

Pursuant to creating an online library of materials, APSA members would benefit from the creation of a repository of images that professors could use, free of charge, in their instructional materials.

RATIONALE: Educators are often hamstrung by copyright laws that limit their free use of images, either in the creation of classroom materials, visual presentations, and/or textbooks. This can result in biases in how they illustrate events, through overrepresentation and underrepresentation of certain kinds of people in power, authoritative roles, and situations. This kind of repository could be created and maintained by a member section, group, or individual, or be incorporated into a larger content management system.

3. TEXTUAL ANALYSIS/LANGUAGE TRANSLATION

Melissa Williams and Darrell West

A growing number of political theory scholars have begun using a diverse array of computational technologies to shed new light on familiar terrain in the history of ideas, to jump-start research in new fields such as comparative political theory, and to generate new modes of collaboration with empirical political scientists. "Digital humanities" techniques have been slower to take hold in political theory circles than in literary studies and history, but the field is ripe for further innovation.

Some of this work is made possible by the digitization of large corpora of source texts in the history of ideas, such as the "Electronic Enlightenment" project housed at the University of Oxford, Academia Sinica's collection of works in classical Confucian philosophy, and a growing number of digital archives of Islamic texts. Other projects, such as the Participedia project on experiments on deliberative democracy around the world, use crowd-sourcing research techniques to generate new databases that can be mined for new theoretical insights.

The following text briefly surveys some of the innovative uses of new technologies in recent work in political theory and highlights some especially promising areas for new work, particularly in the emerging field of comparative political theory.

Text Mining

Text-as-data approaches use a variety of computational techniques to analyze corpora of texts, including "canonical" texts in the history of political thought, the writings and speeches of political figures, and the wide-ranging textual production of broader public spheres. Text-as-data approaches violate basic truths about how human language works by stripping words of their syntactical and social contexts and can never substitute for careful interpretation (Grimmer and Stewart 2013). Nonetheless, these have the potential to reveal patterns in language use over large bodies of material that the solitary researcher could not otherwise detect. As Jennifer London argues in a helpful survey of recent work in political theory that utilizes text-mining techniques (on which we draw heavily in this section), these techniques offer opportunities for fruitful collaborations between empiricists and humanists in advancing our understanding of how political discourse changes over time and how we should understand the relationship between rhetoric and politics (London 2016).

Some of the most fascinating text-mining work relies on one of the simplest applications of the technology:

“Digital humanities” techniques have been slower to take hold in political theory circles than in literary studies and history, but the field is ripe for further innovation.

word frequency studies. Danielle Allen’s *Why Plato Wrote* (2010) uses the digitized corpus of Athenian political speeches to demonstrate not only that both Plato and Aristotle used political concepts in ways that departed from conventional usage, but that their conceptual coinages changed Athenian political discourse. Plato’s use of metaphor and vivid imagery, however, had more of an impact in shaping the “culture wars” of fourth-century BCE Athenian politics, and Allen argues that he consciously intended to shape political life by generating “surpluses of linguistic power” from his insights into epistemology. Alison McQueen has also used word frequency studies (in particular, Google Ngrams) to build an intriguing argument that Hobbes’s increasing turn to the Hebrew Bible, and in particular his reinterpretation of the figure of Moses, was an effort to subvert the rhetorical uses of Moses and the Hebrew Bible by contemporary English republicans and parliamentarians (McQueen 2015).

Other text-mining approaches use more complex statistical models to reveal word clusters or constellations of terms across larger corpora of texts. Tracking changes in these clusters over time, or different constellations of terms in different political contexts, can reveal shifts in political discourse and, potentially, conceptual change across time and space. Franco Moretti is a pioneer in “digital humanities” research at Stanford University and an advocate of combining techniques of “distant reading” with the “close reading” in which humanists are traditionally trained. He collaborated with historian Dominique Pestre to trace shifts in the linguistic style of World Bank reports over more than 50 years. Based on their research, they argue that the style that emerges in the 1990s is apt for saying very little for which the Bank could be held to critical account (Moretti and Pestre 2015). Peter De Bolla uses comparable techniques to a very different end: mapping the relationship between discourses of “rights” and other concepts to pinpoint the historical emergence of the concept of universal human rights in revolutionary America (De Bolla 2013).

Mining texts for patterned regularities can adopt “supervised” or “unsupervised” strategies (Grimmer and Stewart 2013). In the former, the researcher uses interpretive methods to identify the cluster of concepts that are relevant for the study. In the latter, the computational program is used to discover linguistic

clusters to identify areas for further probing. One collaborative study between an expert in the history of Western political thought, an expert in Islamic political thought, and an expert in text-as-data methodologies illustrates the potential of “unsupervised” methods for identifying comparable conceptual clusters across cultural divides. Noticing that medieval and early modern intellectual traditions in both

European and Islamic contexts developed a genre of “advice to princes” literature, Lisa Blaydes, Justin Grimmer, and Alison McQueen of Stanford University established a database of core texts in Western and Islamic traditions and ran a program that identified four core themes common to both bodies of literature (Blaydes, Grimmer, and McQueen 2013). This approach could have significant implications for the emerging field of comparative political theory, and in particular lends support to the possibility that cross-cultural differences in ideas of politics lie less in the radical discontinuity in normative commitments across cultures than in the relative priority or weight that different traditions grant to different normative considerations.

Data Visualization

Among the most illuminating innovations in “digital humanities” research are the diverse techniques by which large-n data are converted into visual representations of patterns that human interpreters of texts and contexts might otherwise miss. Word clouds, visual representations of word frequency in texts or corpora of texts, are now familiar to most of us, but they can be potent means of demonstrating that political discourses vary according to the relative stress placed on key terms and not only because of the presence or absence of certain terms.

Maps, and especially diachronic maps, are another particularly potent form of data visualization for understanding how ideas travel through space and time. Stanford University’s “Mapping the Republic of Letters” project, which works in collaboration with the “Electronic Enlightenment” project at University of Oxford, has developed software to show how the networks of correspondence of key intellectual figures of the European Enlightenment changed over time, and to what extent their patterns of communication validate the idea of the “Republic of Letters” as a cosmopolitan public sphere (Stanford University 2016). Launched in 2009, “Mapping the Republic of Letters” has the potential to bring social

network analysis into conversation with historical and literary studies to generate a deeper understanding of how ideas travel and how relationships of social and political power function to facilitate or impede the spread of ideas about politics.

The use of mapping technologies is also important in projects such as Participedia, which situates studies of experiments in deliberative democracy according to their location on a map of the world (Participedia 2016). The project is still in the development stage, and biases in existing data currently make it impossible to track influences in the development of deliberative initiatives over time or across space. In principle, however, the database eventually will enable analysis of cross-regional influences in deliberative practice and the “contagion” of institutional design across contexts of application.

Crowd Sourcing

The use of new technologies to generate innovations in political theory research requires creative collaborations among researchers who possess field-specific expertise. But new research agendas can also harness some of the energy of technologically-enabled social networks to generate new knowledge. The Participedia project mobilizes networks of scholars, citizen activists, and government agencies to generate numerous case studies of practices of deliberative democracy, where a common template for case studies will enable researchers to discover patterns of success and failure and, therefore, contribute to democratic theory. Crowd-sourced research itself expresses a democratic ethos insofar as it affirms the relevance of the knowledge of ordinary, nonspecialist practitioners to generalizable findings in social science.

Crowd sourcing also provides a bridge between new technologies of research and teaching because the careful design of projects can create new space in which student work contributes substantively to the research endeavor. Some of the case studies that are in the Participedia database, for example, are generated by students in courses designed by faculty affiliated with the project.

The challenge with crowd-sourced research is to ensure that the quality and validity of research contributions meets a high scholarly standard and generates comparable data across case studies.

Machine Translation and Computer-Assisted Translation

Language is one of the greatest barriers to harnessing new technologies to advance research in political theory. The global dominance of English generates biases in the kind of research that is possible in the development of both

software and the textual databases that can be analyzed with these new tools.

Nonetheless, the field of machine translation is rapidly progressing and may offer a partial solution to these biases. There may be significant potential for joining crowd-sourcing technologies with machine translation to produce new databases that could be analyzed using both digital and conventional methods. A basic model for such collaboration would begin with the identification of a body of texts worthy of translation and use machine translation to generate a first rough translation of select texts. Students working with the supervising research faculty—perhaps in collaboration with language departments and their students—could then refine the machine translations.¹ The final review of the translation would be the responsibility of the supervising faculty. Alternatively, online crowd-sourcing platforms could refine translations, which would liberate the translation process from a particular institutional locale. An in-between model might be to form networks of collaboration among researchers in diverse geographic locations, each working with teams of students to generate the translation of key texts into multiple languages. Machine translation and crowd sourcing would not be a substitute for the nuanced judgment of scholars with expertise in both the original language of the source texts and the historical and social contexts in which those texts were produced. In principle, however, they could accelerate the production of databases that bridge the linguistic divide.

4. PUBLISHING

David McBride and David Mainwaring

Overview

It is an exciting time in publishing, which is going through the biggest revolution since Gutenberg. Never before have there been so many opportunities to reach so many people in so many different ways. Emerging digital technologies offer significant advances for readers, authors, peer reviewers, teachers, editors, and learned societies.

Some of these innovations empower researchers to play a greater role than ever before in determining the way in which their work looks, how readers interact with it, and how it is promoted. Others help to reveal parts of the academic process that were previously hidden, for example peer review or data creation. The implications for political science and political scientists are numerous, but center on relevance, transparency, and engagement; research outputs that are produced more quickly and with features

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to aid reader understanding and teaching; outputs that are easily found and which link to supporting materials; and outputs that can be discussed, distributed, and built on with unprecedented ease.

APSA is engaged in publishing in an increasing number of ways. These include the four primary journals; the multiple organized section journals; the proposed new open access journal; books; reports; the newsletter; and, most recently, the [PSNow website](#). We outline here four of the most exciting clusters of technology developments in academic publishing. Although, but not all, many of these initiatives have originated in academic journals, most of these ideas could be applied to one or more of these existing publications or be used to connect the different publication types. We have stopped short of advocating new types of publishing activity for APSA given the breadth of activities already in place. By demonstrating how political science could benefit from the enhancement of APSA's existing publishing program we hope to initiate a wider discussion about where to invest finite time and resources via a review of this basket of new digital tools and services.

Authoring and Peer Review

The emergence of new identifiers (e.g., Open Researcher and Contributor Identification, ORCID, for author identification) and metadata standards (Journal Article Tag Suite, or JATS, for Extensible Markup Language, or XML) has enabled innovative writing and peer-review tools that can partner with existing online peer-review systems and publishing platforms. This promises to improve some inefficiencies and problems in the publishing process (e.g., authors adhering to style guidelines, speed of reviews, and recognition of reviews) to benefit authors, editors, and readers. Faster publication times, in particular, will help boost the relevance of political science research.

- Writing tools (e.g., Manuscripts, Overleaf for [LaTeX](#)) are providing a user-friendly online writing environment, collaborative tools, and journal-specific templates. Direct submission to peer-review systems, such as ScholarOne Manuscripts and Editorial Manager, is possible. These tools also validate important metadata such as ORCID (discussed later) or FundRef.

- Workflow management systems offer modular, end-to-end alternatives to the likes of ScholarOne, promising more flexibility over workflow based on continually updated XML. This reduces the need to convert between formats at production and increases the speed to

publication.

- Reward and recognition for peer review is being experimented with in many ways including social-media-like platforms that give reviewers profiles and credit for their work ([Publons](#), [PubPeer](#)) without

compromising a journal or book series' review policy.

- Author identification—[ORCID](#)—provides researchers with a unique digital identifier (akin to a DOI), enabling them to preserve a record of their publication history. An ORCID is required by several research funders (e.g., Wellcome Trust) and is increasingly integrated into the tools previously mentioned ([Publons](#), [ScholarOne](#), [Editorial Manager](#)).

Layouts, Visualization, and Data

Enhanced formats promising improved reading experience on multiple devices will help with communication of political science research. The big publishing challenge is to visualize data and other complex content to keep pace with the research technologies used by political scientists:

- HTML Reading enhancements: Part of a trend toward clean reading experience for books and journals, HTML readers allow users to focus on text, which is optimized for mobile or Kindle devices.

- Enhanced PDF readers, such as [ReadCube Connect](#), ensure that PDFs connect to other supporting materials. For books this increasingly includes self-assessment exercises, student discussions, and online higher education courses. This technology will affect classroom teaching.

- New techniques and visualizations: As computational methods grow, solutions to layout new forms of content are developing, such as 3-D models of complex social dynamics, dynamic mapping, and new ways to maximize the impact of audio-visual material (e.g., encouraging authors to provide audio abstracts or audio slides about their research).

- Data repositories: The increasing emphasis on research transparency means more partnerships between journals (and societies with broad publishing portfolios like those of APSA) and repositories such as [Dataverse](#).

- Data tools for researchers: Alongside the data repositories (such as [Dataverse](#), [Dryad](#), and [Zenodo](#)) that provide a way for authors to archive the data associated with their research, a number of tools go beyond this to help manage or visualize data or design workflows. [Figshare](#) is a data repository, but it also has a visualization component: it presents any uploaded file within a viewer, making it ideal for 3-D visual component. The [Open Science Framework](#)—from the Center for Open

Science—is both a repository and a project management tool that researchers can use to house their data, files, and protocols. However, journal editors and publishers can use it to design workflows before formal publication (for example the pre-registration of the study design prior to publication, as promoted by the journals involved in the US Election Research Preacceptance Competition). [Code Ocean](#) is a repository for software code and associated files, as well as a computational platform that allows others to execute the published code and view the outputs.

- Annotations of academic content from services, such as [Hypothes.is](#), are gathering pace with the creation of new web standards and tools. Annotation could be one of the key ways in which research transparency is advanced for qualitative research.

- Multimedia companion websites for books: Until a few years ago, creating multimedia companion websites for books was a bespoke process. Also, the cost to publishers for creating sites was too high to justify given the modest sales expectations of most academic books. That has changed recently, and publishers now have simple and highly functional templates that allow authors to incorporate virtually any web-based content into the publisher-hosted site. The cost of creating such sites for publishers with template-based processes is negligible—now only \$100–\$150. Oxford University Press, for instance, has found that audio and visual add-on components receive more use than text-based add-ons, but this usage varies from discipline to discipline. For data-rich political science projects, publisher-hosted companion sites allow authors to post important material that they could not include in the book (e.g., four-color figures and graphs). Publishers can also now include links to the book’s multimedia components in the ebook version as long as the reader is using a tablet (ebook readers do not allow for this).

- Improved online platforms and better ebook functionality: During the past decade, publishers have modestly improved the visual presentation of electronic books in online repositories like University Press Scholarship Online and Oxford Scholarship Online. The vast increase in holdings in these repositories has incrementally increased usage statistics, which is an important determinant in whether institutional subscribers (e.g., research libraries) continue to maintain their subscriptions to such content. Similarly, individual ebooks that feature relatively complex presentations of social scientific data look much better than in the recent past. This change is partly a result of the shift away from publishing ebooks as universal PDFs (“UPDFs”) and using the more standard e-publication format, which is Kindle-ready. Publishers initially published monographs mostly in the relatively clunky UPDF format because it was cheaper,

but a combination of cost efficiencies and market demand have caused most to shift to the more versatile (and now only slightly more expensive) e-publication format. (Retailers prefer the e-publication format, too.) To be sure, in the ebook realm all publishers have to adhere to Amazon’s formatting preferences given its overwhelming dominance in the ebook market. It controls more than 80% of the market, and channels like Apple pale in comparison (at least for now).

Discovery of Content

With the increasing volume of online research, commentary and gray literature, there is an increasing requirement for tools that “push” the discovery of content to users (inside or outside academia) based on their behavior, criteria, or profile.

- Relatedness: It is increasingly important to provide intelligent recommendation features (“if you liked this article, why not read this?”). Many publishers are developing relatedness tools across their content, especially those with unified platforms. Services such as [ReadCube Discover](#) or [Utopia Documents](#) can make cross-platform suggestions. Amazon provides a similar service to publishers on its site, which can be important for book content sale and discovery.

- Recommendation tools and engines targeting, recommending, and assessing publications for researchers, growing in STM, have potential to grow further as demand grows for targeted recommendations (Edanz, ResearchSquare, Journalysis, and Journal Guide are examples of tools that suggest publication venues to researchers).

- Reference managers serve a number of purposes. As well as allowing researchers to generate a list of citations in the desired style or to create and organize libraries of articles to read later, these are also engines that can push recommended papers to users (e.g., [Mendeley](#)).

- Text and data mining: There are still technical and cultural barriers to its uptake, but legal changes promoting noncommercial mining of research have already occurred in Europe. [CrossRef](#) has data-mining tools (its Metadata API) that allow researchers to mine open access and subscription-based content.

- Integrated searchable platforms: Larger scholarly publishers have gradually moved toward creating integrated platforms that allow users to access to research in a broad array of formats: books in platforms like Oxford Scholarship Online; encyclopedia entries (e.g., The Oxford Research Encyclopedia); bibliographic essay entries; journal articles; and individual handbook/companion essays. All such publishers are working on ensuring that online subscribers (via institutional subscriptions) are

able to use live intra-press links to toggle between related research pieces on a press's various platforms. As a result of these ongoing innovations, books—which in the past have been a bit more “freestanding” than other types of research (at least in the digital sense)—are now better integrated in the larger research ecosystem. It is worth noting that for books at least, the integration is occurring at an intra-press level rather than across publishers. This limitation derives mostly from the unique nature of the book as a commercial product, but integration is improving. Such book platforms—from ones hosted by individual publishers to consortia like University Press Scholarship Online (UPSO), which hosts a broad range of university press publishers—are all easily searchable. For Oxford University Press and UPSO (which is hosted by Oxford), 80% of the searches are through Google.

Postpublication Impact and Evaluation

Ways of assessing the political science literature now range from established citation metrics (impact factor) to more enhanced understanding of what happens downstream (e.g., Altmetrics, event-tracking, and author-driven promotion):

- Alternative metrics: Metrics help authors (and APSA) understand the impact of their political science research through the use of DOI-tracking metrics that include nontraditional sources (blogs, social media, news sources, gray literature). Some metrics provide dashboards and analytics; some provide profiles that allow researchers to highlight impactful work. Well-established for journals (e.g., [Altmetric](#); [Impact Story](#); the forthcoming [DataEvent](#) from CrossRef), metrics are available for books (e.g., Bookmetrix) and could be used on other APSA publications, such as reports, and the APSA member newsletter. PSNow activity can drive Altmetric scores.
- Enhancing impact: Kudos enables authors to include lay summaries and other information (e.g., related links) to a publication to drive discovery and usage, allowing authors to monitor its impact.
- New venues for publicity: Several political-science oriented outlets now exist where authors can publicize their work to a larger audience. Such sites may now seem ordinary, but it is worth remembering that no such sites existed 15 years ago, and the existence of Dan Drezner's original blog was regarded as vaguely problematic. And while blogs are not new, hosting of such blogs or rather blogger collectives by major media companies like the Washington Post is new. It is not a technological innovation per se, but the willingness of major venues like the Post to institutionalize the publication of important political science research can only increase the circulation of such findings. It is also now typical for authors and book

publishers—whose marketers and publicists typically have firm relationships with online media—to work with each other to publicize their ideas in appropriate mainstream online venues, like the Monkey Cage, Vox, the New York Times' “Room for Debate,” [fivethirtyeight.com](#), and Foreign Policy. Presses like Princeton University Press and Oxford University Press also maintain blogs that have significant readerships, and just as importantly their blog entries are occasionally selected by more widely read blogs. They also can enjoy second lives through social-media pickup. Finally, radio programmers at NPR typically scan the major papers' content for stories, and the increased visibility (relatively speaking) of serious political science research in venues like the Post and the Times improves the chances of radio appearances for political scientists who write in such venues. To be sure, venues like Perspectives, PSNow, and the APSA website are all able to broadcast the work of authors too, and such publicity can occasionally wind its way to the broader mainstream media if APSA does the appropriate outreach to the right venues (e.g., Vox). The major university press book publishers are all fairly strong in this area, and it would make sense for APSA to reach out to them if the organization identifies a book that represents a major innovation in the field and which has real public policy implications. Presses would be happy to work with APSA. In short, the technology is not novel, but the media environment is. The online connections between academia and the mainstream media is more seamless, and major publications are far more willing to devote coverage to political science research than ever before.

5. DATA CAPTURING FOR TEACHING AND RESEARCH

Latanya Sweeney

Imagine political scientists capturing temporal data on the web and making the captured information widely available for research. We propose a permanent online archive of temporal data selected by researchers, such as political ads, ballots, and government websites, and then made permanently and widely available for research.

One way we could achieve this vision is to archive the entire web. The [Way Back Machine](#) attempts to do so, but clearly the rate of change and massive number of webpages makes it impractical to capture a copy of all webpages every day. We could do better by having political scientists locate the webpages and websites of interest to political scientists and then archive those. The idea of using

political scientists to crowd source the selection of which webpages and websites are of interest to political scientists is at the heart of our approach.

There already exist services that if a researcher provides a particular webpage URL, the service will capture an image of the webpage as it is at that time. However, what if political scientists want to monitor changes to the webpage over time? They would have to manually capture the page at regular intervals. Our approach seeks to make automated capture over time easy for political scientists.

We first piloted the idea with a political science course at Harvard College. Students used the service to capture political ads, monitor government web sites, and capture images from webcams around the world. The pilot is no longer operational, but the captures from the pilot remain available. Visit <http://foreverdata.org>; each click on "Browse" randomly selects a previously stored capture. The URLs are permanently available and include an image of the page and a text version for easy processing.

We made it easy for political science students to "program" the capture by selecting the URL and the rate of capture. The interface used in the political science class is <http://foreverdata.org/webshot/index.html>. The Appendix contains samples of the thousands of images the students captured.

We propose to modernize and update the ForeverData service for APSA members. An APSA member would identify a website or a webpage to capture and specify the rate of capture, such as once or on a regularly scheduled basis. Captured images would then be freely and widely available through search or by permanent URLs. Because we already have the technical expertise to construct and enhance the system, we can launch the service to APSA members for nominal cloud storage costs. Over time we can reduce storage costs by allowing the Way Back Machine to store the captured content (they have expressed a willingness to do so). Having this infrastructure operational would further enable long-term developments such as automated scrapping of content to copy it from the captured content into spreadsheets and CVS files for analysis.

6. SURVEY OF APSA MEMBERS REGARDING THEIR USES OF TECHNOLOGY

Renée Van Vechten and Toni Pole

How might APSA better serve members of the profession through technological applications? To assess the needs of existing and potential members and to gauge

interest levels in items that the taskforce had identified as potentially viable, the Teaching and Learning Subcommittee surveyed a mix of current and lapsed APSA members in spring 2017.² An online questionnaire was administered to 2,687 recipients, 2,000 of whom were randomly selected to represent the APSA membership. To better match the US population, the panel was weighted to include a greater number of underrepresented minorities in the profession, and an additional 687 were drawn from the membership of the APSA Organized Section on Political Science Education between 2012 and 2017. The overall response rate was 13.1% (n=313), a figure that somewhat limits the generalizability of findings.³ Despite this, the response set provides significant clues about online services that may benefit different types of members of the profession.³ A summary of respondent characteristics can be found at the end of this section.

Key questions centered on professional training resources, classroom resources, and miscellaneous resources that could be integrated into APSA's existing technological infrastructure; these probed whether the respondent was likely to use the innovations listed. Descriptive statistical analysis indicated varying levels of support according to the type of position held, as well as the type of institution where the respondent was employed. Relatively few differences in preferences were found to exist between APSA members and nonmembers, or between tenured and untenured faculty. Among faculty, only a few items attracted strong support across institutions. Teaching-oriented resources tended to be favored by those in AA-granting and BA-granting institutions and least favored by PhD-granting institutions and those outside academia, trends that are explored later in the text.

Select classroom resources attracted substantial support. Majorities reported that they were likely to use syllabi (71.6%), simulation and games resources (65.2%), and assignments resources (55.3%), support that held across all positions and institutional types. Only a minority of respondents were likely to use online lecture slides, seek resources for online courses, or use a hub to connect with others teaching similar courses. However, preferences for each of these resources varied by current academic position and institution type (see table 1).

With respect to professional resources, online workshops on teaching/pedagogy were likely to be used by a majority of respondents (58.8%, n=184). Wide majorities were disinclined to use diversity/inclusiveness resources, political science internship resources, how-to videos on teaching and mentoring, and discounted subscriptions to online resources such as Coursera or Monday Morning Mentor. As with classroom resources, however, employment and institution type were closely tied to the

appeal of such resources, as shown in table 1.

Table 1 demonstrates that full-time faculty in PhD-granting institutions are least likely among all groups to use classroom resources of the types suggested in the survey, followed by those working outside academia. Faculty working in community colleges are drawn to online teaching resources in the form of videos, workshops, and online course help, and a slight majority would use a hub to connect with others teaching similar courses. A majority of faculty in BA-granting institutions are most supportive of online workshops and internship resources, and a slight majority favor using a hub to connect with others. Faculty in MA-granting institutions most strongly support online workshops and resources for teaching online courses. In fact, the likelihood of using any of these teaching and professional resources is negatively correlated with institutional ranking ($-0.224, p < .01$).⁴

With respect to other resources, very few scholars in any type of institution were likely to use language translation tools (15.3% overall; $n=48$). Graduate students were most likely to use how-to videos on giving a job talk or presentation (two-thirds of them indicated they would use this resource, meaning 16 of 24 respondents), but nearly half of all other respondents (47.1%, $n=136$) also would be likely to use

such videos—a group that mostly includes those who are employed outside academia as consultants or in government or who serve in administrative roles (faculty are least interested in this tool at 46.7% likely to use it, $n=108$).

For all teaching resource measures, political scientists working in institutions outside the United States ($n=47$) provided similar answers to those working at US institutions ($n=265$), with a few notable exceptions. Scholars in the United States were more likely to use syllabi (73.6% to 59.6%, chi-square statistic significant at $p < .05$), simulations and games (69.4% to 40.4%, $p < .001$), assignments resources (58.9% to 34%, chi-square significant at $p < .01$), and internship resources (39.2% to 21.3%, $p < .05$) than their counterparts outside the United States.

Finally, to assess potential support for an online library of teaching resources, this question was posed: “The American Sociological Association offers an online, peer-reviewed library of high-quality teaching resources including syllabi, class activities, assignments, lectures, and more. (See table 2.) If APSA offered a similar peer-reviewed library of teaching resources, how likely would you be to use it?” Support among all types of respondents was high, with 85.9% either extremely or somewhat likely to use it,

Table 1: Likelihood of using classroom or professional resources

	LIKELIHOOD OF USING...				
	Online workshops teaching/ pedagogy	Poli Sci Internship resources	How-to videos on teaching/ mentoring	Online course resources	Hub to connect similar courses
POSITIONS OTHER THAN F/T FACULTY *	51.2% (43)	32.1% (27)	44% (37)	42.9% (36)	47.6% (40)
FULL-TIME FACULTY IN AA-GRANTING INSTITUTION (N=28)	82.1% (23)	25.0% (7)	67.9% (19)	67.9% (19)	53.6% (15)
FULL-TIME FACULTY IN BA-GRANTING INSTITUTION (N=74)	67.6% (50)	55.4% (41)	39.2% (29)	21.6% (16)	51.4% (38)
FULL-TIME FACULTY IN MA-GRANTING INSTITUTION (N=42)	71.4% (30)	47.6% (20)	40.5% (17)	59.5% (25)	42.9% (18)
FULL-TIME FACULTY IN PHD-GRANTING INSTITUTION (N=84)	45.2% (38)	22.6% (19)	23.8% (20)	34.5% (29)	39.3% (33)

NOTE: Only “would be likely to use” responses are displayed.
 *Includes emeritus, retired, adjunct, consultants, government, researchers, post-doctoral fellows, graduate students ($n=84$). Full-time faculty, $n=228$; two cases excluded from original dataset due to incomplete information.

Table 2: Likelihood of using an online, peer-reviewed teaching resources library

	LIKELY TO USE AN ONLINE LIBRARY OF PEER-REVIEWED TEACHING RESOURCES?		
	Not likely	Neither likely nor unlikely	Likely
POSITIONS OTHER THAN F/T FACULTY (41) *	7.3% (3)	4.9% (2)	87.8% (36)
FULL-TIME FACULTY IN AA-GRANTING INSTITUTION (N=27)	0	3.7% (1)	96.3% (26)
FULL-TIME FACULTY IN BA-GRANTING INSTITUTION (N=73)	5.5% (4)	2.7% (2)	91.8% (67)
FULL-TIME FACULTY IN MA-GRANTING INSTITUTION (N=42)	9.5% (4)	7.1% (3)	83.3% (35)
FULL-TIME FACULTY IN PHD-GRANTING INSTITUTION (N=81)	9.9% (8)	11.1% (9)	79.0% (64)

How might APSA better serve members of the profession through technological applications?

7.3% neither likely nor unlikely to use it, and 6.8% either somewhat or extremely unlikely to use it. Among all suggested teaching-related tools, this attracted the most support across institutions.

Importantly, respondents across the board valued peer-reviewed teaching resources. Among the sample, 76.5% (n=234) indicated it was moderately to extremely important that such resources be peer reviewed, whereas equal percentages—11.5%—indicated it was not at all important or only slightly important.

As the APSA Council considers ways to address teaching-related needs, these results (albeit based on a small sample) point to the primacy of high-quality, peer-reviewed resources and the usefulness of certain tools that may appeal to different members of the profession. Whereas those in PhD-granting institutions are least likely to support the development of such resources overall, a substantial minority at that level and in all other types of programs have needs that could be addressed through online workshops, for example. Further, we should stress that even if a majority of respondents in a particular setting are not inclined to use a given resource, a substantial number may, in fact, seek them out. There also may be an associational advantage to drawing in new or lapsed members by offering specific resources to constituencies that may be underserved in the area of teaching and learning; we suggest selective distribution to cover the complementary needs of different constituencies.

Specific suggestions for APSA initiatives can be summarized as follows:

1. Create an online, peer-reviewed library to centralize teaching resources.
2. Pursuant to creating a library of resources, develop a more accessible, reviewable, updatable, well-organized syllabi repository.
3. Develop and deliver a series of online workshops regarding teaching/pedagogy, on an ongoing basis and independent of the annual APSA Teaching and Learning Conference.
4. Pursuant to creating a library of resources, curate a collection of internship-related materials that would be of particular interest to faculty in BA- and MA-granting programs.
5. Develop online course resources that would particularly benefit faculty in AA- and MA-granting programs.

Methodological Note on Respondent

Characteristics (n=313)

Location of institution where respondent is currently employed or studying:

- Midwest 20.7% (n=65); Northeast 22.9% (72), Other US region 1.6% (5); Outside the United States 15% (47); South 19.1% (60), and West 18.8% (59); missing (1).
- Tenured 40.3% (n=126),

Tenure-track 19.2% (60), not on tenure track/untentured 27.2% (85); missing (42).

- Adjunct 3.8% (n=12); Graduate Student 7.3% (23); Other* 24% (75); Assistant Professor 22.7% (71); Associate Professor 63 (20.1%); Full Professor 22% (69); missing (23).

- *Other includes: Academic Administration .6% (n=2), Consulting 1.6% (5); Emeritus Faculty 1.3% (4); Government 1.6% (5); Other researcher/scholars/ 3.5% (11); postdoctoral fellow 2.9% (9); research organization or think tank 1.6% (5); retired 1.9% (6); missing (28).

ENDNOTES

1. The Electronic Enlightenment project is developing a translation program along these lines. See <http://www.e-enlightenment.com.myaccess.library.utoronto.ca/info/collaborate/translations.html>.
2. APSA staff administered the survey. The first e-mail was initially sent April 12, 2017, and the survey closed May 10, 2017. Reminders were sent April 20, April 28, and May 9.
3. Respondents who belonged only to the panel of members, however, responded at a rate of 9.8%. Members of the Political Science Education section who were not also members of the panel responded at a rate of 22%. Those who were both a member of the panel and had been members of the Organized Section on Political Science Education in the past five years responded at a rate of 16.7%. Thus, those who have been affiliated with teaching and learning are overrepresented in the respondent set. One case was excluded because of missing data, bringing the total number of cases to 313.
4. Bivariate correlation (two-tailed), where institutions are coded as AA-granting, BA- or MA- granting, or PhD-granting; responses to two batteries of questions regarding teaching and professional resources were summed to create an index. Using all four institutional type categories, the correlation was -.206 (p<.01).

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APPENDIX

Figure 1: Sample Picture Captures for Students in Political Science Class



Students used captured images from webcams around the world, to monitor crowds forming, border crossings, emergency responses, and more.

Figure 2: Sample News Captures for Students in Political Science Class



Students used captured content from newspapers, and government and political websites to capture ballots and monitor advertisements and how content changed over time.

