Science, Technology & Public Policy

Political Studies 179C   W 1:15-4:00
Prof Paul Steinberg   Shanahan 3461
Office hours by appointment   steinberg@g.hmc.edu
in Parsons 1280

What does it take for insights from STEM and other arenas of knowledge production to have an influence on the world? Conversely, how is the production of research shaped by policy and politics? This seminar will feature guest speakers who have practical experience applying research findings in policymaking processes at the local, national, or international level. Our sessions will be divided between these guest lectures and student-led discussions of weekly readings. The readings draw on research literatures ranging from political science to policy theory, community mobilization, history, law, STS (Science, Technology, and Society), and many other fields. Course concepts will be applied to diverse issue areas such as health, social justice, education, and the environment. Final research papers will explore topics of the student's choice at the intersection of knowledge production and public policy.

Course requirements

30%   Pre-class written reflections on readings. Add to the Canvas discussion a couple of paragraphs each week (total - not per reading), reacting to readings and raising questions for discussion. You can miss adding comments one week without affecting your grade. Consider the *Why Read?* document when crafting your weekly responses. Try to post at least part of your reflections at least a day prior to class to help the discussants.

5%   Discussants: At the beginning of each class session, a team of two students will summarize the above comments from Canvas in a 5-minute overview intended to spark discussion. Sign up for your discussant role here.

20%   Citizen science assessment. Working in teams of two, write up a 2-3 page analysis of your experience with a citizen science project. Both students submit this on Canvas.

35%   Final research paper (10-12 pages): Choose an issue at the intersection of technical expertise and policy/politics. Use a minimum of 10 peer-reviewed sources. Grade breakdown: Paper proposal 5%, annotated bibliography 10%, final paper 20%.

10%   Final research presentation: Provide a 5-minute summary of your paper, presented in a compelling, clear manner. The sign up sheet and grading rubric are here.

More than one unexcused absence will result in a lower final grade. To pass the course, students must submit at least three weeks of reading reflections and can have no more than

three unexcused absences. An excused absence requires medical or other documentation.

All readings are on Canvas and are linked below. To schedule office hours, please email me indicating a couple of available times.

Tips for Reading

Anticipate about six hours of reading or outside work per week. Remember, each session is equivalent to three 50-minute class periods. Do not attempt to do all the readings the night before or you will rush through and not benefit from the course in the same way.

Develop your skills in identifying the central argument of the reading ("the big picture"). This is usually signaled by the title, abstract, introduction, section titles, and conclusion. Your understanding of the central argument should go far deeper than common sense insights that someone could have thought up without reading the article. What did you learn that you did not already know? Highlight and recall some details to bolster the credibility of the points you share in your reading reflections and class discussions, but do not worry about retaining all of the specific examples provided in the articles. If you were to think back on this reading ten years from now, what should you remember in order to apply it to the intellectual challenges and social issues that you care about?

For this course (but not for all courses!), feel free to skip any detailed discussions of methods used in the assigned articles.

Accommodations

I am committed to making this course accessible to everyone. If you need accommodations based on a disability, including mental health or other chronic or temporary medical conditions, please contact the disabilities resources person from your home campus. Also feel free to ask me any questions – I'm happy to help.

Schedule

Jan 22   Introduction and overview

What is science? What is policy? How should experts communicate with policymakers? Under what conditions do new ideas have an impact on the world?

Readings:

Pielke Jr, Roger A. Chapter 1: Four Idealized Roles of Science in Policy and Politics. In The Honest Broker: Making Sense of Science in Policy and Politics. Cambridge University Press, 2007.

British Science Council. About Science - read "Our definition of a scientist" and "10 Types of Scientist."

Kimberly Martin, Keith E. Lee and John P. Hall, *Public Policy: Origins, Practice, and Analysis*, pp. 1-8 only.

In preparation for our session on local government, attend a Claremont City Council meeting over the coming month on the second or fourth Tuesday at 6:30 p.m. in the Council Chamber, 225 Second Street. Zoom (see the link) is an option, but in-person gives a better feel for the process. Observe the public comment period toward the beginning of the meeting and then at least 30 minutes more.

Jan 29   Experts and democracy

One of the longstanding critiques of democracy is that ordinary people lack an understanding of most of the issues they are expected to vote on. What is the appropriate role of expertise in a democracy? How might we take advantage of expert knowledge without undercutting democratic participation?

Dahl, Robert A. *Democracy and its Critics*. Yale University Press, 2008. Chapter 4.

Frank, Thomas, *Listen, Liberal*, Picador Publ., 2016. Pages 20-43.

Dargent, Eduardo. 2015. *Technocracy and Democracy in Latin America: The Experts Running Government.* Cambridge University Press. Read Introduction: Technocracy Under Democracy. (Skip the 'Research Design' and 'Organization of the Book' sections.)

Feb 5   National policy processes

Political power on planet earth is concentrated at the level of national government. How does national policy work? How does the relationship between experts and decision-makers differ from one country to the next?

Guest speaker (1:15-2:30): Scott Pace '80, Director, Space Policy Institute and Director, Institute for International Science and Technology Policy, George Washington University. Former Deputy Assistant to the President and Executive Secretary of the National Space Council.

Readings:

Rosner, David, and Gerald Markowitz (1985) "A 'Gift of God'?: The Public Health Controversy Over Leaded Gasoline During the 1920s." *American Journal of Public Health* 75(4): 344-52.

Baumgartner, Frank R. and Bryan D. Jones (1991) Agenda Dynamics and Policy Subsystems, *The Journal of Politics* 53(4):1044-74.

American Association for the Advancement of Science, *Top Ten Rules for Working with Congress*, Washington DC, 2014.

Hetherington, Elizabeth D. and Alexandra A. Phillips, A Scientist's Guide for Engaging in Policy in the United States, *Frontiers in Marine Science*, 5 June 2020. (The supplementary resource on policy advocacy is quite good.)

Kenny, Caroline, Carla-Leanne Washbourne, Chris Tyler, and Jason J. Blackstock (2017) Legislative Science Advice in Europe: The Case for International Comparative Research *Palgrave Communications* 3(1):1-9.

Feb 12   The role of expertise in local government

Local government is the level of policymaking most readily accessible to citizens and experts alike. In practice, there is considerable variation in the budgets, power, processes, and technical capacity of local governments. How does local government work? What are the opportunities for meaningful collaborations with bearers of in-depth knowledge pertinent to local decisions?

Guest speaker: Seema Patel '02, San Mateo Planning Commissioner 1:15-2:30 Zoom

Submit a one-page reflection on Canvas regarding the city council meeting you attended.

Readings:

Steinberg, Paul F., Chapter 8: Scaling Down, in *Who Rules the Earth? How Social Rules Shape Our Planet and Our Lives,* Oxford University Press, 2015.

Simon, Paul A., Cheryl M. Wold, Michael R. Cousineau, and Jonathan E. Fielding (2001) Meeting the Data Needs of a Local Health Department: The Los Angeles County Health Survey, *American Journal of Public Health* 91(12):1950-52.

Tausanovitch, Chris, and Christopher Warshaw (2014) Representation in Municipal Government, *American Political Science Review* 108(3):605-41.

Feb 19   Expertise in state government

Compared to most countries, the American system grants a great deal of decision-making authority to the states. How does the availability and impact of expertise vary from one state to the next?

Guest speaker (2:45-4:00): Karen Morrison '08, Chief Deputy Director and Science Advisor, California Department of Pesticide Regulation.

Submit your research paper proposal on Canvas before class so that we can discuss in class.

Readings:

McGuinn, Patrick and Supovitz, Jonathan A.. (2016). Parallel Play in the Education Sandbox: The Common Core and the Politics of Transpartisan Coalitions. CPRE Research Reports.

McDonnell, Lorraine M., and M. Stephen Weatherford (2013) Evidence Use and the Common Core State Standards movement: From Problem Definition to Policy Adoption, *American Journal of Education* 120(1):1-25.

Loveless, Tom. Between the State and the Schoolhouse: Understanding the Failure of Common Core. Harvard Education Press, 2021. Chapter 8, Whatever Happened to Common Core?

Squire, Peverill (2017) A Squire Index Update, *State Politics & Policy Quarterly* 17(4):361-71.

Jansa, Joshua M., Eric R. Hansen, and Virginia H. Gray (2019) Copy and Paste Lawmaking: Legislative Professionalism and Policy Reinvention in the States, *American Politics Research* 47(4):739-67.

Feb 26   Science across international borders

For as long as science has existed, it has been a cosmopolitan experience. How do experts from different societies build intellectual communities across borders? What are the mechanisms through which they have an impact? How do their activities reinforce or challenge existing structural differences in wealth and power across the globe?

Begin in class and continue outside of class: International negotiation simulation: "The Mercury Game." Each team member submits the results on Canvas.

Readings:

Haas, Peter M. (1992) Banning Chlorofluorocarbons: Epistemic Community Efforts to Protect Stratospheric Ozone, *International Organization* 46(1):187-224.

Steinberg, Paul F. (2003) Understanding Policy Change in Developing Countries: The Spheres of Influence Framework, *Global Environmental Politics* 3(1):11-32.

Rohan Deb Roy, Science Still Bears the Fingerprints of Colonialism, *Smithsonian Magazine*, April 9, 2018.

March 5

No class today. Prof at International Studies Association in Chicago. Work on research papers and submit your annotated bibliography on Canvas by 10pm tonight.

March 12   Ways of knowing

The expert knowledge of scientists and other credentialed professionals is well known, well documented, and widely respected. Other forms of "expertise" play (or should play) important roles in public deliberation, but have received less attention. What is traditional knowledge? What is tacit knowledge? What are the implications for the role of experts and citizens in a democracy?

2:45-4:00
Guest speaker: Shalem Aboody-López, Founder and Planning Director of Pueblo Planning and former Program Coordinator, Office of Environmental Justice, San Diego County Air Pollution Control District

Bring a laptop to class; the guest lecturer would like everyone on zoom for participatory exercises.

Readings:

McCarter, Joe, and Michael C. Gavin (2014) Local Perceptions of Changes in Traditional Ecological Knowledge: A Case Study from Malekula Island, Vanuatu, *Ambio* 43(3):288-96.

Molnár, Zsolt (2017) I See the Grass through the Mouths of My Animals – Folk Indicators of Pasture Plants Used by Traditional Steppe Herders, *Journal of Ethnobiology* 37(3):522-41.

Schøn, Daniel (1983) From Technical Rationality to Reflection-in-Action. In *The Reflective Practitioner: How Professionals Think in Action*, Basic Books.

March 19   *No class - spring break*

March 26   **Experts as barriers to change**

As one of today's most high profile examples of science and policy, climate change suggests a model in which experts struggle to convince the public and the politicians of the significance of their findings. Yet experts beholden to a particular professional perspective are often the main cause of social problems. What are the implications for our earlier considerations of the relation between expertise and democracy?

Guest speaker: Richard Jones '72, former US Ambassador to Egypt and former Deputy Executive Director of the International Energy Agency

Readings:

Read text and watch video: Charles Marohn, The Five Ways that Engineers Deflect Criticism, *Strong Towns*, October 5, 2015.

Lucy Komisar, Interview with Joseph Stiglitz, *The Progressive*, June 2011.

Robert Van Den Bosch, *The Pesticide Conspiracy*, chapters 2 and 3, University of California Press, 1978.

Coulehan, Jack (2010) On Humility, *Annals of Internal Medicine* 153(3):200-201.

April 2   **Conservative opposition to science**

Why do American conservatives seem to be more skeptical of scientific findings than are their progressive counterparts? What are the implications for the way we practice science? How about for the way we practice politics?

Readings:

Frank, Thomas. What's the Matter with Kansas?: How Conservatives Won the Heart of America, Picador, 2007. Chapter 10: Inherit the Wind.

Gauchat, Gordon (2012) Politicization of Science in the Public Sphere: A Study of Public Trust in the United States, 1974 to 2010, *American Sociological Review* 77(2):167-87.

McKenna, Robin. Asymmetrical Irrationality: Are Only Other People Stupid? Pp. 285-95 in *The Routledge Handbook of Political Epistemology*, Routledge, 2021.

April 9   Citizen science

Citizen science (or "community science") has emerged as an innovative way to engage ordinary people in the practice of science. The details range considerably, from simple data collection to more advanced collaborations. To what extent do these experiments promote democratic participation in the production of knowledge, and at what cost?

Students participate in citizen/community science projects this week and submit a 2-page analysis on Canvas by April 10 at 10pm.

Readings:

Rosas, L. G., Rodriguez Espinosa, P., Montes Jimenez, F., & King, A. C. (2022) The Role of Citizen Science in Promoting Health Equity, *Annual Review of Public Health* 43:215-34.

Optional reading for additional background: Bowser, Anne et al. (2020) Still in Need of Norms: The State of the Data in Citizen Science, *Citizen Science: Theory and Practice* 5(1).

April 16   Promoting reform within expert communities

Social engagement by technical experts is typically understood as a relationship with the outside world, imparting insights beyond the laboratory and laptop. But what is required to promote reform within the expert communities themselves? What do we know about organizational change? How have the organizations where STEM work occurs responded to calls for greater diversity and inclusion?

Guest speaker (1:15-2:30 zoom): Maria (Mia) Ong, Senior Research Scientist at TERC, Founder and Director of Project SEED (Science and Engineering Equity and Diversity), and former member of the NSF Committee on Equal Opportunities in Science and Engineering.

Students presentations on research papers

Readings:

Ong, Maria, Carol Wright, Lorelle Espinosa, and Gary Orfield (2011) Inside the Double Bind: A Synthesis of Empirical Research on Undergraduate and Graduate Women of Color in Science, Technology, Engineering, and Mathematics, *Harvard Educational Review* 81(2):172-209.

Powell, Kendall, Ruth Terry and Sophia Chen (2020) [How LGBT+ Scientists Would Like to Be Included and Welcomed in STEM Workplaces](#) *Nature* 586(7831).

Gosztyla, Maya L. et al. (2021) [Responses to 10 Common Criticisms of Anti-racism Action in STEM](#), *PLOS Computational Biology* 17(7):e1009141.

Kotter, John P., *Leading Change*, Harvard Business Press, 2012. [Chapter 1](#).

April 23   Communicating advanced concepts to general audiences

Public engagement by technical professionals requires a special set of skills to convey ideas to non-experts. What are some of the most important methods, media, and modalities available for doing this well?

Students presentations on research papers

No readings for today. Work on papers.

April 30   Social science

For over a hundred years, the question of whether social science merits public funding has been highly controversial, mistrusted by conservatives wary of its association with the New Deal and movements for social liberation, and poorly understood by prominent natural scientists at the helm of science funding agencies. What are the implications for the practice of social science today?

Students presentations on research papers

Readings:

Solovey, Mark, *Social Science for What? Battles over Public Funding for the "Other Sciences" at the National Science Foundation,* MIT Press, 2020. [Intro](#) and [chapter 1](#).

Research papers are due on Canvas on May 7 at 10pm.

Updated 1/22/25