

Research on Emerging Technologies and Policy



The investigation of social and policy consequences of emerging technologies—like biotechnology, information technology, and nanotechnology—represents a new emphasis for the Institute. Our growing technical capabilities have implications for every societal institution, from economics and business to religion and the family. It is important to begin to address the philosophical and policy questions that surround this type of change and innovation in a systematic and thoughtful way.

Current Projects

NER: Contours of Nano-Problems and Solutions and the Societal and Educational Challenge of Active Nanoscale Technology

Funder: National Science Foundation (NSF)

The objective of this project is to explore the linkage between nanotechnology (NT) as a solution and the strategic definition of problems. Political and public acceptance and support for new advances depend in large part on how solutions are linked to societal problems. What problems are being linked to this new technology and why, to whom the problems are relevant, and who is advocating the solution, are significant questions for decision makers and the public. The methodology is derived from the agenda setting framework within the social sciences which considers how problems and solutions are strategically linked by policy entrepreneurs in order to move issues forward onto the decision agenda. This, in turn, can lead to the institutionalization of ideas within the structure and culture of public policy and in the general fabric of society. The focus on nanotechnology and problem/solution definition proposed here directly addresses the general concern raised in the NSF ANN program solicitation on the interaction of engineering, science, technology and society. It also addresses more specific concerns within the nanotechnology community, particularly as problems and solutions influence the processes and outcomes of public policy, the public support for science, and as factors influencing the direction of technological change. The structure and culture of the nanotechnology network will be assessed across broad stakeholder categories, such as the scientific (NT as basic science) and the business (NT as investment). Each of these stakeholder groups will have problems for which they advocate specific solutions. While stakeholder interests overlap there are often distinctions and dynamics that can be compared in regard to their societal implications. The research team includes: Principal Investigator, Dr. Eric Lindquist (ISTPP Associate Research Scientist/political science) and Katrina N. Mosher (Research Associate and Ph.D. candidate in political science).

Completed Projects

National Survey, Societal Implications of Nanoscience and Nanotechnology —A Baseline Data Collection

Funder: Office of the Vice President for Research, Texas A&M University - College Station

In 2002, ISTPP staff initiated the first stage of work examining the societal implications of nanoscience and nanotechnology. Because some forms of nanotechnology are already appearing in high profile consumer products and are receiving both media coverage and references in commercial films, there is an immediate need for baseline data on: 1) the level of public information, 2) the sources of that information, 3) public's current view of attitudes toward what they know about the science and its applications, and 4) an identification of gaps in the public's information and knowledge base.

To provide this baseline information, we developed and fielded a public survey of a random sample of the U.S. population in spring 2003. The survey had a target sample size of 1000. Although relatively few questions were asked, this sample size was required to control for a variety of socioeconomic, regional, and ethnic identifiers that are important for understanding variations in knowledge levels and attitudes

Research on Emerging Technologies & Public Policy

Completed Projects

Decision Making Under Conditions of Uncertainty: Experimental Assessment of Decision Models

Funder: National Defense University (NDU)

Leaders make numerous decisions about the appropriate utilization of complex scientific and technological innovations almost daily. These decisions are especially problematic because of the difficulty in assessing risks, benefits, costs and side effects of these new discoveries. However, decisions related to the proper investment, implementation and deployment of technological innovation are often made by decision makers with only limited information and scientific expertise. The challenge is, therefore, to make the best possible decision, with the best information available, using the best decision-making technique possible, even in the face of limited information and uncertain outcome.

This research sheds light on the way people make decisions with limited information in the area of science and technology using a relatively new methodology. Computerized process tracing is used in an experimental setting via a new technology (the Decision Board Process Tracer). It allows observation and recording of various indicators of an individual's (and/or group's) choice strategy. Some of the unique capabilities of the computerized decision process tracers are their ability to 1) detect various decision strategies, 2) test the effects of multiple situational and personal factors on decision processing and outcomes, and 3) deal with counterfactual data and scenarios. They can also serve as training devices.

A series of decision-making models are being tested in both academic and actual decision maker environments. The subjects include university students and more experienced decision makers working in military environments. This research will add to the understanding of how the framing of scientific and technological information influences decision making and the nature of the interplay between analytic information and other variables that influence decision makers.

The research team included: Principal Investigator, Dr. Arnold Vedlitz (ISTPP Director/political science); Co-Principal Investigators—Dr. Alex Mintz (political science); Dr. Letitia T. Alston (ISTPP Associate Director/sociology); and Dr. Roger J. Channing (NDU); and Research Scientists—Dr. Steven B. Redd (political science/University of Wisconsin-Milwaukee); Dr. Mark K. Davis (NDU), Dr. Barton J. Michelson (NDU) and Dr. Xinsheng Liu (ISTPP).

Analysis of Public Opinion Surrounding Genetically Modified Organisms

Funder: Jointly supported by the Institute for Science, Technology and Public Policy, and the Institute for Public Policy

In the fall of 2000, the Institute for Science, Technology and Public Policy partnered with the Institute for Public Policy at the University of New Mexico to conduct a study of the way the U.S. public processes information on GMOs and forms opinions on the various aspects of this important topic. This study yielded data from both focus groups and surveys. This investigation is seen as the first in a series of investigations of how scientific information is transferred, processed and used by the public and by policy makers. The research team has made presentations to the National Science Foundation, the U.S. Department of Agriculture, presented a paper at the Midwest Political Association Meeting in April 2002, and is currently working to publish its findings.

The research team included: Dr. Arnold Vedlitz (ISTPP/political science); Dr. Hank Jenkins-Smith (The Bush School/political science), Dr. Letitia T. Alston (ISTPP/sociology); Dr. Guy D. Whitten (political science); and Dr. Carol Silva (The Bush School/political science). Both Dr. Jenkins-Smith and Dr. Silva are formerly with the Institute for Public Policy at the University of New Mexico.

Completed Projects

Symposium on the Future of Citizen-Government Interaction in the Information Age

Date/Location: October 7-9, 2001 at the Presidential Conference Center, Texas A&M University - College Station, Texas

Sponsors: Institute for Science, Technology and Public Policy, The Office of the Vice President for Research, and The Academy for Advanced Telecommunications and Learning Technologies

This event was designed to bring together a diverse group of participants who could share their expertise and insights into the challenges and emerging opportunities for governance and citizen participation presented by developments in the sphere of information technology.

The symposium goals included 1) identifying critical unanswered questions and information needed for future decision making and policy development in answer to the rapid developments of information technology, 2) developing an ambitious research program to address the needs identified by the attendees; and 3) providing a starting point for long-term research partnerships among participants. It is hoped that, ultimately, this effort will contribute to more efficient and productive decision making and more effective approaches and models for citizen-government interaction in the future.

The four sessions focused on: 1) *Perspectives on Citizen and Government Interaction: Current and Future Trends*; 2) *Emerging Challenges of Citizen and Government Interaction in the Information Age*; 3) *Arenas for Citizen and Government Interaction*; and 4) *Identification and Discussion of Research and Development Needs*. The overall objective of the first three sessions was to identify unanswered questions and information gaps in the field and other significant and researchable topics.

Topics that emerged during discussions were diverse, as might be expected in such a new area of inquiry. Nevertheless, themes recurred throughout the Symposium discussions, and we have tried to identify those without losing the detail of the free-flowing discussions. Examples of the themes that recurred, regardless of the topic under discussion, include access and gate keeping; privacy and security, freedom and accountability, as well as issues associated with the rapidity of changes in Information Technology.

Complete lists of ideas and concerns generated by the small group discussions are also included in a symposium report, classified under some key categories, for a meaningful presentation. Before the final or fourth session, participants were asked to prioritize the issues that had been generated during group sessions. In order to provide some structure for this final discussion of research topics, participants were asked to think in terms of standards, process, policy, models, management, role perception and measurement. Given the breadth of many of the topics that emerged during the discussions, we believed that this categorization would contribute to more succinct and easily managed research project ideas.