



The Center for
Nanotechnology in Society
ARIZONA STATE UNIVERSITY

Nanotechnology and Society

Susan Cozzens

Technology Policy and Assessment Center

School of Public Policy

Georgia Institute of Technology

CNS-ASU research, education and outreach activities are supported by the National Science Foundation under cooperative agreement #0531194.



Your research projects

- Electronics

- Advanced Chip-to-Chip Interconnect [Barrett]
- Thermally Enhanced Dynamic Core Migration with Phase Change Materials [Amber]
- Carrier Scattering in Graphene [Benjamin]
- Microfabricated traps for quantum computation [Margeaux]

- Health

- Heart stent material testing and analysis in a microfluidic chip using whole blood samples [Steven]
- Biological Interactions of Gold Nanoparticles [Fiona]

- Plus SURE students



Are you ready to be reflexive?

- What do the authors mean by “being reflexive”?
- Synonyms
- Opposites

People Make Nanotechnologies.

- Who is involved in shaping the technology you are working on?
 - Fuel cells esp. PEM more efficient, reduce CO2 emissions for automobiles. E.g. Toyota
 - Electronic users
 - Promourus – produces materials for electronics
 - NASA, DARPA, Private Industry – Robotics research
 - NIH
 - People who mak

Co-construction

- People live with, in, and through technologies.
- Who will be living with the technology you are working on? In? Through?
 - Assisted technology- To help quadriplegics do different things
 - Quality control – For on-site monitoring of construction
 - Shear Wave Elastography – To help diagnose injuries, easily used by technicians
- How might it shape expectations?
- How might it be incorporated into the lives of the different people who will be living with it?

Co-evolution

- Technological change and social change are closely interconnected.
- What kinds of changes might your technology lead to in the organizations where it is used?
 - Need for increased knowledge on the part of medical professionals in genome research
- Can you envision possible wider changes – in families, communities, jobs, etc.?
 - Hard to envision because it is so far out into the future

Choices about technologies

- There are many ways to design, implement, and use a given technology, and many technological solutions to a given problem.
- What design, implementation, and use options are you considering in your lab?
 - Lower costs, safer products, faster and smaller electronics, better manufacturing processes
- What other solutions are being developed for the problem your technology addresses?

- .

Technologies work through systems.

- Technological systems are frequently highly complex, interdependent, and difficult if not impossible to predict.
- What “networks of people and machines” make your research possible?
 - What does it take to have a clean room?
 - Funding
- What “networks of people and machines” will your technology fit into when it goes into practice?
 - Are any vulnerable to disasters?

Incremental and disruptive

- Social and technological change can be incremental or disruptive and it can be hard to forecast which.
- Which do you think your technology will be?
- What does the web page for your project say it will be?

Controversy

- New technologies are controversial and may create new risks.
- Do you discuss the risks associated with your technology in your laboratory?
- Is your technology controversial?

Technological imagination

- Our technological imagination shapes our future.
- Are there any fictional or artistic representations of your technology?
- What would a science fiction novel about it say, if it were written?
- Are women and men likely to picture the same future of your technology?

People making choices

- People already play an important role in governing new technologies, and they can play an even bigger role.
- Have there been any public debates about your technology? Should there be?
- Who would you like to hear from most about your technology?
- What people from outside your laboratory shape what goes on inside?

Reflexivity

- We need to be more reflexive about how we assess nanotechnology.
- Do we?
- Will this discussion change anything you do in the lab? Any choices you make about your career?
- What messages would you like to send to the authors of this paper?