

# The Diffusion of Innovations Model for Building Interdisciplinary Courses

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## Abstract

An innovation is a new idea, practice, or object that can be adopted over time by members of a social system. The literature on the adoption and diffusion process provides a useful guide for understanding how new research insights move across disciplines in the university. Factors include: (1) characteristics of the innovation, (2) the knowledge required to adopt it, (3) the attributes of the adopters, (4) the process of implementation, (5) the possibilities of re-invention, and (6) the consequences of adoption. All of these influence the degree to which an innovation is adoptable and the rate of its spread. The diffusion model points to the multiple dimensions of the social processes and practices that encourage adoption of ideas across disciplinary divides.

## Questions to Ask

### 1. Characteristics of the innovation

Innovations are not equally worthy of adoption, so

- What is the relative advantage of adoption?
- How compatible is the innovation to prevailing knowledge?
- How complex is the idea/perspective to learn?
- Can it be tried with little risk?
- How observable are the costs/benefits of adoption?

### 2. The knowledge required to adopt it

Innovations can be difficult to adopt, so

- How available is knowledge about the innovation?
- How is it used correctly?
- How does the innovation work?
- How core are underlying principles to adoption?

### 3. The attributes of adopters

Some people are open to new ideas, other not, so

- Is an adopter also an innovator?
- How relevant is the innovation to the potential adopter?
- Is the adopter's need addressed by the innovation?
- What are the individual's attitudes toward adoption?
- How well informed is the adopter about innovation?

### 4. The process of implementation

Not all innovations are easily implemented, so

- Is there a change agent to advocate for adoption?
- How is the change agent an effective advocate?
- What are the models of successful implementation?
- How does implementation affect ongoing activities?
- What is the institutional context for innovation?

### 5. The possibilities for re-invention

Innovations are not equally amendable across settings, so

- Does the innovation assume re-invention will happen?
- How do change agents encourage re-invention?
- How does re-invention facilitate adoption?
- How does re-invention erode innovation's benefits?
- How does re-invention encourage diffusion?

### 6. The consequences of adoption

Innovations are not equally beneficial, so

- What direct effects will be sparked by adoption of the innovation?
- How predictable and observable are the likely effects?
- How desirable are the likely effects of adoption?
- What are the indirect effects of adopting the innovation?
- What is the meaning of the innovation for adopters?

## Examples

### Women & Gender in Science & Technology (course/textbook project)

- Located accessible readings in new scholarship on gender in science
- Developed seminar series for scientists/engineers to discuss readings
- Identified and invited participants interested in readings
- Articulated professional goals for educational innovation
- Established intellectually respectful partnerships with colleagues
- Developed new *interdisciplinary* course, textbook, and research agendas

### Ecology Project (educational research project)

- 1-5 (as above), with dilution of innovation to promote adoption
- Developed *multidisciplinary* research collaborations/publications

### Women and Technology (team-taught course, with Hatice Örün Öztürk, ECE)

- 1-5 (as above), with translation of innovation to promote adoption
- Developed *multidisciplinary* course content

## Discussion

- The process of transfer of knowledge from one discipline to another has multiple components
- The process depends on change-agents and adopters working in collaboration.
- Some ideas transfer better than others.
- Fidelity to disciplinary boundaries can impede transfer
- Interdisciplinary insights can be diluted when adapted to disciplinary frameworks.
- Short term benefits of adoption spark continued commitment.
- Continued commitment sparks long term benefits.
- Interdisciplinary insights are generated by combination of sustained commitment and tangible benefits.