Technology, Change, and Process
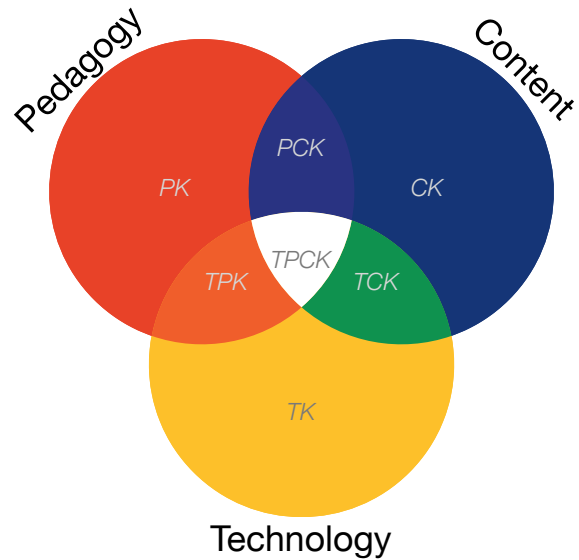
Ruben R. Puentedura, Ph.D.

TPCK and SAMR
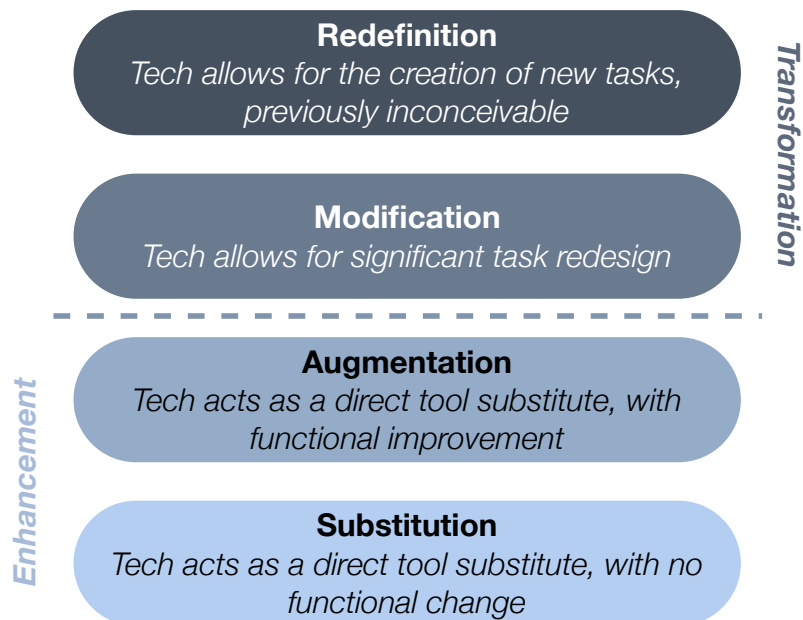
TPCK (Mishra & Koehler)

Pedagogy · Content

PCK

PK · CK

TPCK

TPK · TCK

TK

Technology

SAMR (Puentedura)

Redefinition
Tech allows for the creation of new tasks, previously inconceivable

Modification
Tech allows for significant task redesign

Transformation

Augmentation
Tech acts as a direct tool substitute, with functional improvement

Substitution
Tech acts as a direct tool substitute, with no functional change

Enhancement

The Individual Perspective

New Tools Involve Four Key Dichotomies
(Don Ihde, *Consequences of Phenomenology*)

- an **ampliative/reductive** aspect:
  - new tools make previously difficult or impossible tasks possible
  - however, they also involve tradeoffs
- a **fascination/fear** reaction:
  - fascination results from focus on the ampliative aspects of the technology
  - fear results from focus on the reductive aspects of the technology
- an **embodiment/otherness** component:
  - a skilled user comes to see the tool as an extension of their body or mind
  - an unskilled user sees the tool as an alien, non-intuitive element
- a **focus/action** shift:
  - how a task is visualized is affected by the aspects of a task that are made salient (or hidden) by a specific tool
  - how a task is executed is affected by the aspects of a task that are made easy (or difficult) by a specific tool

A Simple Example

- an **ampliative/reductive** aspect:
  - "With this stick, I can pick fruit that was previously out of reach."
  - "The stick does not let me determine how ripe the fruit is beforehand."
- a **fascination/fear** reaction:
  - "I'll be able to pick the fruit that animals could not reach!"
  - "I'll get a stomach ache from unripe fruit!"
- an **embodiment/otherness** component:
  - "The stick feels like it's part of my hand."
  - "I keep poking holes in the fruit - I can't feel when I'm touching it."
- a **focus/action** shift:
  - "The stick leads me to think about picking individual pieces of fruit, rather than a volume of fruit."
  - "I use the stick to pick fruit visible in a straight line, but stay away from the more challenging fruit in between branches."

A (Somewhat) More Modern Example

- an **ampliative/reductive** aspect:
  - "Google allows me to find many more resources than the card catalog!"
  - "Google does not list the books and journals in the college library."
- a **fascination/fear** reaction:
  - "I can access many more up-to-date sources than ever before!"
  - "Those sources cannot compare with the reliability of the college library!"
- an **embodiment/otherness** component:
  - "I use Google as an "exomemory" for just about anything."
  - "I'm overwhelmed by the volume of information I get from Google, and can't do much with it."
- a **focus/action** shift:
  - "With Google, I think about gathering first, organizing second."
  - "I generally only look at the first page of results from Google, and leave the rest alone."

The Group Perspective
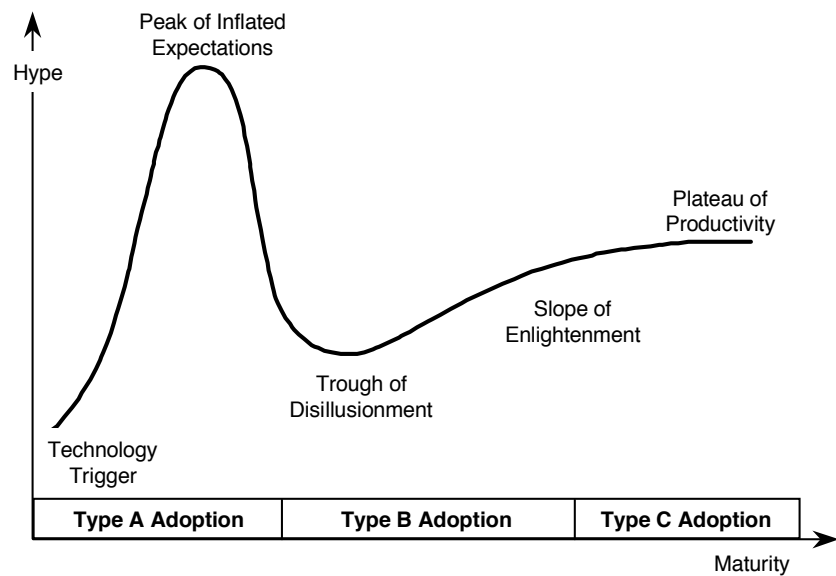

How Innovations Spread
(Everett M. Rogers, *Diffusion of Innovations*)
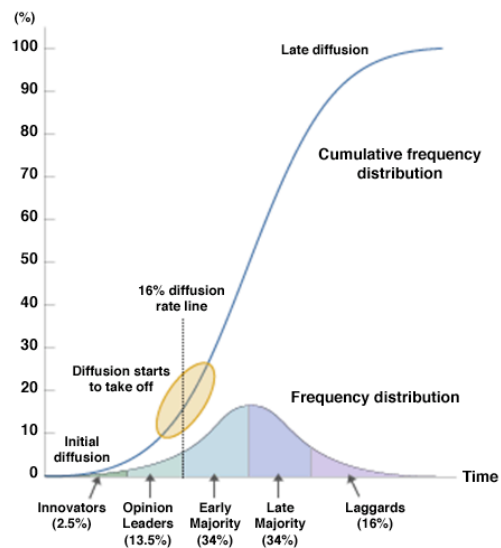
The Technology Perspective

The Gartner Hype Cycle

Source: GartnerGroup

The Gartner Hype Cycle: Phases and Adoption Types

- **Five Phases:**
  - *Technology Trigger*: a new technology generates significant press and industry interest;
  - *Peak of Inflated Expectations*: a flurry of well-publicized activity results in some successes, but more failures;
  - *Trough of Disillusionment*: the technology becomes unfashionable, and the press abandons the topic;
  - *Slope of Enlightenment*: focused experimentation and solid hard work lead to a true understanding of the technology's applicability, risks, and benefits;
  - *Plateau of Productivity*: the real-world benefits of the technology are demonstrated and accepted.
- **Three Adoption Types:**
  - *Type A*: technologically aggressive organizations.
  - *Type B*: technologically low risk organizations, focused on maintaining competitiveness.
  - *Type C*: technologically cautious organizations, focused on cost reduction.

The Toolkit

The Horizon Report
(http://www.nmc.org/horizon)

7 Things You Should Know About…
(http://www.educause.edu/7Things)

Hippasus

http://hippasus.com/rrpweblog/
rubenrp@hippasus.com