Interdisciplinary Instruction

AGEP California - Summer Teaching Institute 2019
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The What/Why of Interdisciplinary Instruction: Definitions, Reasons, and Practical Possibilities
Definitions: Types of Integration

1. Cross-disciplinary — *Observing* another discipline

2. Multidisciplinary — *Collaborating* with other disciplines

3. Interdisciplinary — *Synthesizing* different disciplines’ knowledge and methods

4. Transdisciplinary - *Unifying* disciplinary frameworks to create a new disciplinary approach.


http://www.arj.no/2012/03/12/disciplinarities-2/
The Increasing Influence of Interdisciplinary Studies

• **Current research** increasingly emphasizes interdisciplinary problem-solving.
  
  • e.g., ““Solving the puzzle of complex diseases, from obesity to cancer, will require a holistic understanding of the interplay between factors such as genetics, diet, infectious agents, environment, behavior, and social structures” — Elias Zerhouni (former NIH director) Begg & Vaughan 2011

• **Interdisciplinary papers** have a notable impact on current scholarship.
  
  • “the top 1% most cited papers exhibit higher levels of interdisciplinarity than papers in other citation rank classes and that this relationship is observed in more than 90% of NSF specialties.” (Chen, Arsenault, & Larivièrè, 2015)

• **Current professions** increasingly seek out individuals with interdisciplinary skill-sets
  
  • e.g., thinking complexly, communicating readily, and collaborating comfortably with specialists across diverse fields. (National Academies of Sciences, Engineering, & Medicine, 2018)
Ways Interdisciplinary Methods & Topics appear in Instruction:

• “Interdisciplines” (Interdisciplinary Programs)
  • e.g., Cognitive Science, Feminist Studies, Bioethics, Environmental Science & Management

• Discipline-Crossing Courses
  • e.g., “Environmental Studies” or “Science & Technology in Everyday Life”

• Interdisciplinary Projects
  • e.g., Interdisciplinary guest presentations, student research projects
Case Studies:
Interdisciplinarity at four campuses
R1 with diversity and interdisciplinary mission statements

UC Santa Barbara: “The Explicit”

Mission Statement:
“... Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary collaboration that is responsive to the needs of our multicultural and global society”

- The Bren School
- IHC & MAT
- LISO program
- Crossroads
CSU Channel Islands: “The Tacit”

Smaller, more organic formation of interdisciplinary coursework and collaborations (12 faculty!)

• Team teaching
  — “Art of Science”
  — “Drug Discovery & Development”

• Upper-division GEs
  — taught by single teacher but encompasses many disciplines
  — “Fermentation”
CSU Fresno: “The Classic”

Established institution, working to expand into an interdisciplinary model

• Cohort hires
  — H2O
  — Health Disparities
  — Urban & Regional Transformation

• Affiliated faculty / projects
  — “Book of the Year” book club
  — Sponsored speakers
  — Grant proposals, publications

• Masters degrees
  — build-your-own in “Interdisciplinary Studies”
  — Degree in “Water & Resource Manag’t”

President’s Initiative:

Become a world-recognized center for all things water-related

(Essential to life in central CA, these issues involve Agriculture, Fisheries, Hydrology … many disciplines working together)
UC Merced: “The New”

A university growing from the ground-up around interdisciplinary research sites and projects.

- Sierra Nevada research Institute
  - Big Qs: Water, Forests/Fire, Climate in CA
  - “Environmental Systems” grad program

- National Research Trainingship Program
  - Training a workforce (Intelligent Adaptive Systems)
  - Skills: multiple literatures, communication
The How of Integrating Disciplines:
In research, in teaching
Basic Principles of Interdisciplinarity:

• Collaborative Mindset  
  conflict → complement

• Concrete Preparation  
  general goals → specific  
  plan/product

• Explicit Room for *Confusion*  
  demonstrating expertise →  
  *modeling educational dialog*
Strategies for Coordinating:

• **Vocabulary**
  — What we do/value (Theory, Methodology)
  — How we talk about it (Jargon)

• **Goals & Outcomes**
  — Why we’re in this work (Priorities of focus)
  — What we hope to get out of it (Deliverables)

• **Roles & Division of Labor**
  — Knowing everybody’s expertise (Trust)
  — Dividing tasks and setting timelines (Communication)
Activities:
Getting your Feet Wet with Interdisciplinary Dialog
First: Know What You Do

“Mapping the Making of Knowledge”

• Think about your own Research:
  — Sites/Sources, organized into Data, analyzed to yield Findings, communicated to further a valued Knowledge-Base (How?)

• Draw a map of the Cycle:
  — from Motives > Ideals > Plans/Strategies > Actions/Responses > Realizations/Boundaries > the next motivating Question …
Next: Know How to Communicate That

“Disciplinary Crib Sheets”

• Think about the core ideas of your discipline:

  — The Concepts key to making/discussing knowledge in your field; the Jargon that you use as short-hand for these big ideas and methods

• Boil this down to a manageable (4-6) set of terms, drawn as a procedural flow:

  — Where does it start, how does it proceed, what does it yield?