



Interdisciplinary Instruction

AGEP California - Summer Teaching Institute 2019
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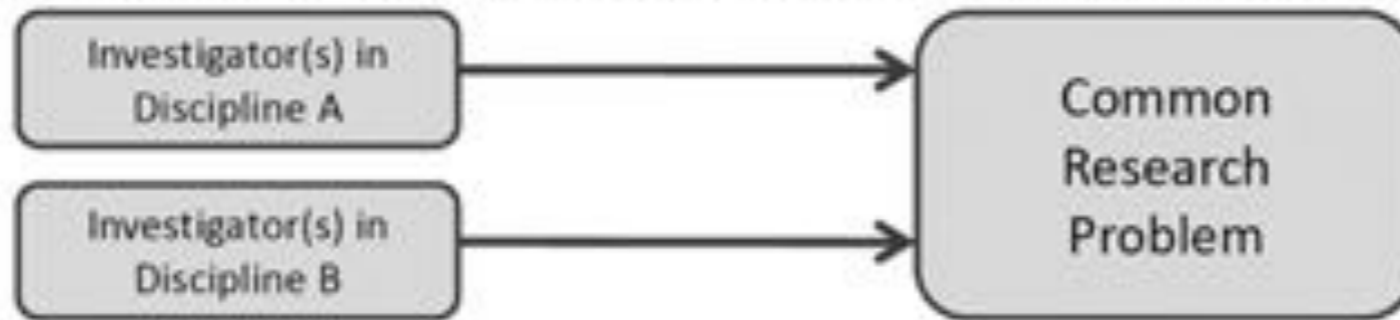


**The What/Why of
Interdisciplinary Instruction:
Definitions, Reasons, and Practical Possibilities**

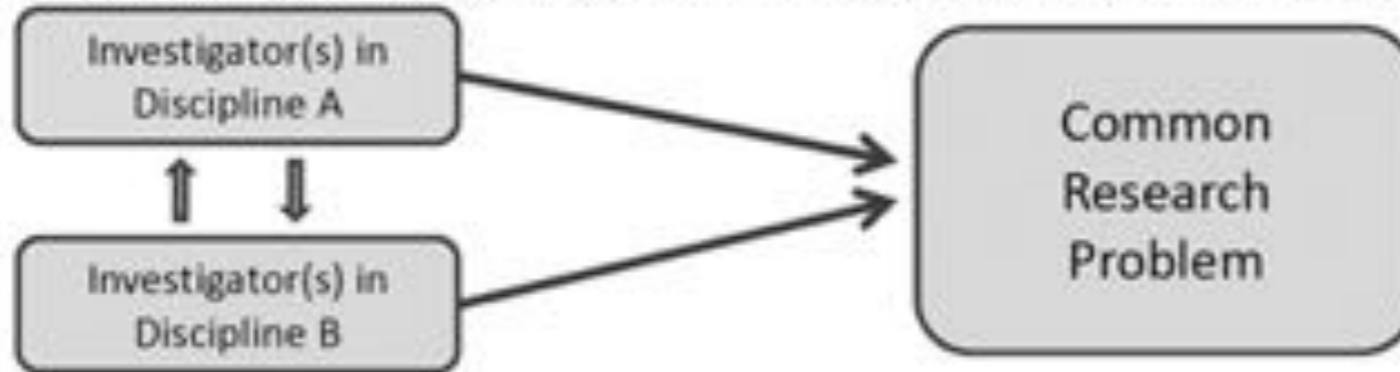
Definitions: Types of Integration

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.

1a. MULTIDISCIPLINARY: Investigators from more than one discipline working in parallel on the same problem



1b. INTERDISCIPLINARY: Investigators from more than one discipline working together on the same problem



1c. TRANSDISCIPLINARY: Investigators from more than one discipline working together to create a new approach to address the same problem



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, & Larivière, 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

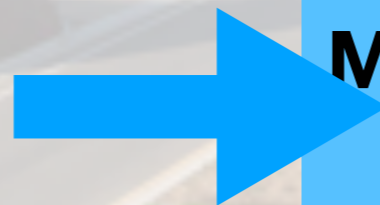
Case Studies:

Interdisciplinarity at
four campuses



UC Santa Barbara: “The Explicit”

**R1 with diversity and
interdisciplinary
mission statements**



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 Trainings 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 shorthand 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?

