

THIRTEEN WAYS OF LOOKING AT INTERDISCIPLINARY RESEARCH

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Wallace Stevens, “Thirteen Ways of Looking at a Blackbird”

II.

I was of three minds,

Like a tree

In which there are three blackbirds.

IX.

When the blackbird flew out of sight,

It marked the edge

Of one of many circles.

Thirteen Ways of Looking at Interdisciplinary Research

- A model for why interdisciplinary research is important,
- How disciplines interact at boundaries,
- Why science and humanities need each other,
- Nuts and bolts suggestions for supporting interdisciplinary teams.

Thirteen Ways of Looking at Interdisciplinary Research

Dr. Michael Burkart, Agricultural Research Service, Ames Soil Tilth Laboratory, Ames Iowa

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Dr. Caroline Gottschalk –Druschke, Assoc. Professor of English and Natural Resources, University of Rhode Island

Dr. Scott Graham, Assoc. Professor, Dir. Scientific and Medical Communications Laboratory, Univ. of Wisconsin-Milwaukee

Dr. Ali Yalcin, Professor, Industrial Engineering, Univ. of South Florida

1. Why is Interdisciplinary Research so Important?

Bruno Latour: move from “matters of fact” to “matters of concern”

H. Collins and R. Evans: work “upstream” of scientific project reports

How can we better manage uncertainty?

2. Complexity and Hybrid Phenomenon

“No one can predict the issues that science and society will consider *most pressing* in the decades to come. But if we look at some high-priority issues of today—such as world hunger, biomedical ethics, sustainable resources, homeland security, and child development and learning—and pressing research questions, such as the evolution of virulence in pathogens and the relationship between biodiversity and ecosystem functions, we can predict that those of the future will *be so complex as to require insights from multiple disciplines.*”

—*Facilitating Interdisciplinary Research*, 26

2. Complexity and Hybrid Phenomenon

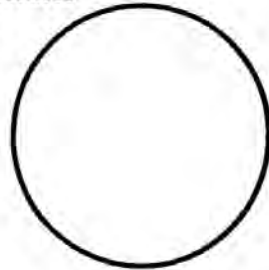
“An *urgent* push to bridge the divide between the biophysical and social sciences is crucial. It is the only way to drive global sustainable development that delivers social inclusion, environmental sustainability and economic prosperity. Sustainability is *the classic ‘wicked problem’ characterized by poorly defined requirements, unclear boundaries and contested causes that no single agency or discipline is prepared to address.*”

–Brown, Deletic & Wong, 315

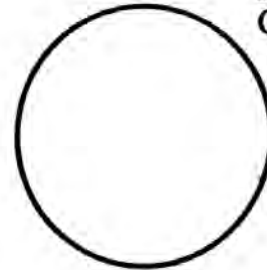
3. Bruno Latour and Hybrid networks

First dichotomy

Nonhumans
Nature

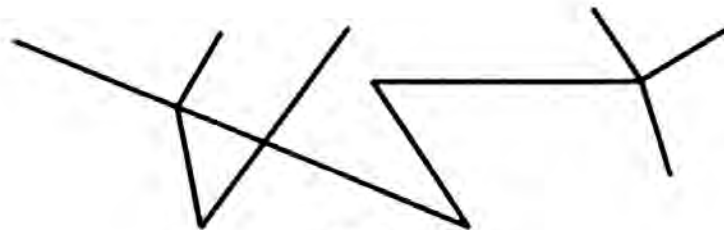


Humans
Culture



WORK OF
PURIFICATION

Second dichotomy



Hybrids
Networks

WORK OF
TRANSLATION

4. The Myth of Two Pains

Modern culture rests upon an underlying belief so strong that it grips us with the force of a founding myth. Call it the myth of Two Pains. We live in an era when many people believe—as a basic unexamined foundation of thought—that pain comes divided into separate types: physical and mental. These two types of pain, so the myth goes, are as different as land and sea. You feel physical pain when your arm breaks, and you feel mental pain if your heart breaks. Between these two different events we seem to imagine a gulf so wide and deep that it might as well be filled by a sea that is impossible to navigate.

—D. B. Morris

5. Being Interdisciplinary is Hard to Do

Challenges for Humanities:

- Models of knowledge making,
- Grant opportunities,
- Public engagement.

Challenges for Sciences:

- Difficult to justify humanities on grants,
- Political and activist perspectives,
- Little experience and training.

6. Building Better Tools.

Tangible tools NSF, NIH and USDA can recognize:

- Data visualization,
- Big data analysis,
- New media for citizen science,
- Hand held digital technologies,
- Gender in development and sustainability,
- Communication designed to cross boundaries.

7. Negotiating Boundaries

- Moving from “demarcation exigency” to an “integration exigency”
- Knowledge maps as “boundary objects”
- Designing communication to manage “boundary work”

8. The Challenge of Power and Status

“We witnessed biophysical researchers accusing social scientists of poor rigor and of spending too much time conceptualizing problems without exploring and offering solutions. Conversely, social scientists were often frustrated that biophysical researchers were too focused on solutions, reductively overlooking the wider societal implications of their proposed solutions. . . . This discord is exacerbated by an inherent cultural hierarchy that often privileges the biophysical sciences over the social sciences. Environmental problems have typically been framed from a biophysical perspective, meaning that social scientists are not effectively engaged in developing integrated solutions.”

–Brown, Detelic & Wong, 316

9. Dump the Rolodex

- Interdisciplinary teams populated with the CVs of strangers are difficult to integrate across disciplines.
- Their proposals are often rejected as incoherent and unintegrated.
- Building interdisciplinary capacity is a process.

10. If You Build it, They Will Come

Build the interdisciplinary team first, then search for funding.

- Dog parks and architecture,
- Faculty fellowships,
- Nuts and bolts: buy-out and start up funds

11. What Counts as Bang for your Buck

How do you count interdisciplinarity:

...this paper suggests a longer citation time window for evaluating interdisciplinary research. Although variety and disparity [of references in articles] have significantly positive effects on long-term citations, they have negative effects on short-term citations. Therefore, if we adopt a very short citation time window, we would systematically underestimate the impact of interdisciplinary papers with a higher level of variety or disparity. (Wang et al)

What do you count:

Nonacademic publications, influential blogs, community impact, changes in the environment.

12. Follow the Money

Budget lines follow department lines, so does research effort.

Can we increase flexibility in accounting?

13. Because it is fun

I learned in detail things I could never learn on my own by reading articles and I got to teach my discipline to an intellectual peer who knew little or nothing about my field. I frequently find myself wondering why they are doing that or realizing that I'd never thought about how important something might be. This may not mean much to deans or colleagues who have to be fixated on getting grants, but it is what makes it worth it for me.

–Mike Burkart