How to Catalyze Collaboration

Inspiration, Imagination and Determination ...

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Collaboration:

Noun (/kəˈlæbəˈreɪʃən/)

1. act of working with another or others on a joint project
2. something created by working jointly with another or others
3. from French collaboration, noun of action from Latin collaborare

Sources:  Collins English Dictionary - Complete & Unabridged 2012 Digital Edition¹-²
          Online Etymology Dictionary, © 2010 Douglas Harper³
Types of Collaboration:

1. Departmental (*Intra-* vs. *Inter-*):
   - Between two investigators (*Joint-PIs*)
   - Among more than two investigators (*PI + Co-PIs*)
   - Between two departments (*Multiple PIs*)

2. Institutional (2 or 2+ Schools):

3. Multi-Institutional:
   - *City-Region*
   - *State*
   - *National*
   - *International/Global*
How to solve SCIENCE’s big problems ...

Interdisciplinarity ???

... turn the fraught flirtation between the social and biophysical sciences into fruitful partnerships ...
INTERDISCIPLINARY RESEARCH IS ON THE RISE

21st century saw that proportion of interdisciplinary work reach an all-time high.

SOME FIELDS ARE MORE INTERDISCIPLINARY THAN OTHERS ...

Sources: Raw data from ThomsonReuters’ Web of Science, analyzed by Cassidy Sugimoto (Indiana University), Juan Zhang (University of Quebec), Yves Gingras & Vincent Larivière (University of Montreal). Data from personal communication, forming the basis of charts published in V. Lariviére & Y. Gingras in Beyond Bibliometrics (eds B. Cronin & C. R. Sugimoto) 187–200 (MIT Press, 2014).
... AND SO ARE SOME COUNTRIES

Publications in world’s top 10% of interdisciplinary papers (%)

- India: 13.0%
- Mainland China: 12.4%
- Taiwan: 11.9%
- South Korea: 11.2%
- Brazil: 11.0%
- Italy: 10.3%
- United States: 9.7%
- Japan: 9.7%
- United Kingdom: 9.1%
- Germany: 8.5%

Comparison to world average interdisciplinarity (%)

- Mainland China: +9%
- India: +7%
- Taiwan: +6%
- Brazil: +4%
- Australia: +2%
- South Korea: +2%

Source: Pers. ComM./Elsevier; http://go.nature.com/ucpXVD
INTERDISCIPLINARY RESEARCH TAKES TIME TO HAVE AN IMPACT … but it’s worth it!

Impressive ...!

OK, Tell me,

How it can be practiced?
FIVE Principles:

• Forge a Shared Mission
• Develop ‘T’-shaped Researchers*
• Nurture Constructive Dialogue
• Give Institutional Support
• Bridge Research, Policy and Practice

* T-shaped Researchers = abilities of persons in the workforce = Versatilists

The vertical bar on the T represents the depth of related skills and expertise in a single field, whereas the horizontal bar is the ability to collaborate across disciplines with experts in other areas and to apply knowledge in areas of expertise other than one’s own.

David Guest: *The Independent, September 17, 1991; The Hunt is on for the Renaissance Man of Computing.*
1. Forge a shared mission:

- Provides a compelling account of overall goal of the collaboration
- Maintains a sense of purpose despite occasional failures and appreciate investment in terms of
  - Time
  - Monies
  - Expertise, and
  - Approaches of intersecting disciplines
- Minimizes loss of in-house skill-sets
- Motivates collaboration across multiple institutions
2a. Develop ‘T’-shaped Researchers:

- Ensure **success due to deeper breadth and depth** of multiple fields
- **Build credibility** by incorporating individual scientific contributions in their chosen fields
- Encourage engaging **ideas across the disciplines** in their own field
- Help maintain **high publication rate with high impact**
- Help secure increasing **interdisciplinary research funding**
2b. Three Stages of Development: Novice to ‘T’

Reaching the ideal constructive communication across sciences takes *Time and Patience*. The crucial process of transformation passes through several stages of development to reach the desired level of novice to ‘T’:

1. New investigators tend to *Dominate discussion* and assert *Primacy of their discipline*
2. Slowly they *recognize importance of other* disciplines and *adopt more appreciation* and understanding
3. Eventually, researchers settle into a *productive space of constructive dialogue*
Journey to T: It takes Time

3. Nurture Constructive Dialogue:

- Encourage participants to interact in *Plain English*, i.e. (avoid *discipline-specific jargon*)
- Foster *empathy and respect* for other disciplinary norms
- Reflect on *what is working* for the interdisciplinary team
- Organize regular *interdisciplinary forums/workshops*
- Publish *annual report* about the work done by the interdisciplinary research group
- **Develop short-courses** for undergraduate and graduate students, new and/or junior faculty across the campus
4. Provide Institutional Support:

- **Senior Leadership should signal that it values** and encourages **Interdisciplinary Research** that attracts significant industry involvement and delivers outcomes that have real-world impact.

- Value of **interdisciplinary research** should be disseminated **as an integral part of institution policy, promotion criteria and seed-funding programs**.

- Institutions should **establish interdisciplinary PhD programs** for the cohort of students working on a common **global challenges** across a number of disciplines.
5. Bridge Research, Policy and Practice:

• Establish *enduring connection between researchers, policy makers and industries* – as a driving force for long-term collaboration to solve global challenges

• Allow frequent events where *professionals from policy and industry can interact and exchange workable ideas with interdisciplinary researchers*, *viz.* Regional Workshop, Annual Day and Roadshow at city, state or national level
Did you notice something different here in the presentation?
Configurations of the CUBE !!!

4-As = Appreciate... Adjust... Adopt... and Achieve !!!!
Make it Mainstream, Yo’ll Ways to Promote interdisciplinary Research...

Funders:
1. manage funding from interdisciplinary perspective while strongly reinforcing research impact
2. review panel should include a balance of experts from social and biophysical sciences, plus end-users of research viz. policy wonks
3. RFAs should request balance between disciplines and that team should have proven record of collaboration
4. publications in their own disciplines should be essential while in other disciplines desirable

Institutions:
1. introduce Key performance indicators that promote T-shaped researchers
2. Identify institutional research strengths that has potential for interdisciplinary collaboration and incentivize it via seed-grants
3. Provide platforms – seminars, workshops, interacting sessions – to discuss challenges in cross-disciplinary research and offer insights. Co-locate researchers from different fields who work on same Grand Challenge.
4. Invest in Interdisciplinary PhD cohorts, co-supervised by academics from diverse departments or faculties.
Make it Mainstream, Yo’ll
Ways to Promote interdisciplinary Research...

Publishers:
1. Invest in and create high-quality interdisciplinary journal, managed by editorial teams or board of T-shaped researchers
2. Run special issues in high impact, single-discipline journals that focus in interdisciplinary research
3. Peer reviewers should assess work using the disciplinary expertise, while being tasked to be open to innovation across disciplines

Researchers:
1. Build stamina, patience and self-awareness to manage the long journey of establishing a productive interdisciplinary team
2. Put your best idea forward even if its unfinished, and be open to alternative perspective from other disciplines, policy makers, industry practitioners and community stakeholders
3. Prioritize depth early on, and embrace breadth by building relationships with those from other fields and practices
Unleash the potential!