

Leading Cross-disciplinary Research Teams

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Workshop 1 Recap and Key Takeaways

- Recording and slides available at: <https://www.isce.vt.edu/events/isce-2023-2024-team-science-workshop-series.html>
 - Distinguish between different types of cross-disciplinary research
 - Identify team science skills and competencies for successful research outcomes
 - Recognize team science competencies and skills needed for leading cross-disciplinary research teams
- Takeaways and Tips
 - Consider your own transdisciplinary orientation and collaborative readiness
 - Devote considerable time to team composition
 - Consider including convergence research / SciTS expertise in your team

Workshop Learning Objectives

- Identify the key components of leadership for cross-disciplinary teams
- Identify the key facilitating conditions for effective teams that leaders can control
- Learn about two leadership strategies and how they can be implemented in your team
 - Collaboration planning
 - Team debriefs

Diagnose your team's leadership

- Our team has a clearly articulated vision which we developed collaboratively.
- Our leader collaboratively establishes concrete goals for our team.
- In our team, we don't have clearly defined roles and responsibilities.
- Our leader demonstrates little or no self awareness and as a result has little awareness of the dynamics that surround them.
- Our leader understands their own strengths and weaknesses as well as those of the team members.
- In our team, we keep our team leader in the loop continuously before, during, and after the task, regardless of task complexity.
- In our team, we don't bother sharing our perspectives / opinions / ideas if they are different from the leader's ideas.
- Our leader makes sure everyone in our team is on the same page by clearly communicating and sharing information with team members.



Diagnose your team's leadership

- In our team, we all hold ourselves and each other accountable.
- In our team, people are hesitant to share our concerns about the science or interpersonal issues related to the team.
- Members in our team don't attend meetings or respond to email regularly.
- Our leader can detect when there is tension in our team and effectively intervene to resolve it.
- Our leader is often overwhelmed because they don't delegate and would rather do everything themselves.
- Our leader takes our input into consideration when making decisions that affect the team.
- Our leader supports others taking on leadership roles.
- In our team, resources are misaligned with the goals.



Team Leadership: Facilitating Conditions for Team Effectiveness

- Is my team “real”?
- Does my team have a compelling direction?
- Does my team have an enabling structure?
- Is there a supportive organizational context?

Leadership of cross-disciplinary teams

- Directive leadership
- Facilitative leadership
- Cross-disciplinary teams need:
 - Integrative leadership
 - Transformational leadership
 - Shared leadership

Using *social influence processes* to *direct and sustain efforts* toward a *shared collective goal*. Leadership behaviors are more collectively utilized among team members.



Case discussion: It's not working

- Dr. Cohen, PI and Dr. Millstrom, branch chief, appeared to have a shared vision for the collaborative project in which they were involved. However, when it came to the implementation phase, it became clear they did not agree on how to achieve the vision. They were at odds about when to move the findings from the laboratory into the clinical setting, for example. Dr. Millstrom argued that preclinical results were sufficient. Dr. Cohen argued that the mechanism behind the preclinical data was unclear and until there was a better understanding of the results, the project should not be advanced to the clinic. Mediators needed to be brought in to help make the best decision for the research project.

A framework for cross-disciplinary team leadership

- Co-create a **compelling vision**
- Co-develop **integrative team tasks**
- Provide an **enabling structure**
- Engage in **reflexivity**
- Manage **difference and conflict**

Strategy # 1: Collaboration Planning

Visioning, Integrative team tasks, and Enabling structure

What is Collaboration Planning?

- Structured activity whereby the team clarifies expectations and obligations to the team and team outcomes
- Results in a **living document** including
 - Vision, mission, purpose statements
 - Operating guidelines
 - Behavioral norms
 - Performance management processes
- Created through a series of structured and deliberative discussions

Co-creating a compelling vision

- (Re)define scientific problem parameters
- (Re)clarify, (re)specify, (re)prioritize goals and sub-goals
- PURPOSE:
 - Create a shared mental model of the team's goals and tasks
 - Remind team of the purpose and direction of their work
 - Express the team's vision and direction as tangible products (rather than lofty ideals)
 - Unify and motivate team members

Co-develop integrative team tasks

- Develop an understanding of how team might use the knowledge / resources held by each team toward collective goal.
- Design sub-goals / tasks that will require the elaboration of members' contributions
- Identify steps for the effective exchange of member knowledge and experience
- Create explicit relationships between sub-groups
- Set clear, challenging, and consequential goals and performance standards

Co-develop integrative team tasks

PURPOSE:

- Orients, energizes, and engages team members
- Structures and distributes work in way that encourages cross-pollination of knowledge
- Maintains team cognition (shared mental models, situation awareness)
- Counter strong in-group/out-group tendencies / social fault lines

Provide an enabling structure

- Establish **core norms of conduct** / expectations for working together
 - How will you communicate? Frequency of communication? Expectations for response? Meeting conduct/practices? Supportive communication norms? Decision-making approach?
- Establish clear **team roles** (IRB coordinator, media, project management, data management, evaluation)
- Establish **co-authorship policies**
- Establish norms and mechanisms **holding oneself and each other accountable**
- Establish **conflict management approach** to prevent and manage unproductive conflict

Provide an enabling structure

PURPOSE:

- Creates an explicit (written) structure for supporting collaborative activities, considering challenges, and enabling adjustments
- Increasing member sense of autonomy and identification with tasks and team
- Create opportunities for feedback

Case discussion: It's not working

Dr. Salazar and Dr. Buchanan, two scientists from different institutions, were involved in a long-term collaboration. The two PIs had not explicitly agreed-upon guidelines for determining authorship. Dr. Salazar published a paper in a high-visibility journal using data that had been generated by postdocs in her laboratory as well as by postdocs in Dr. Buchanan's laboratory. Although Dr. Salazar acknowledged Dr. Buchanan's lab's contribution in the paper, none of the researchers from that laboratory were included as authors. Dr. Buchanan disagreed with the way the data from her laboratory were presented in the published paper and asked her to retract it. When Dr. Salazar failed to address the concerns raised, Dr. Buchanan contacted senior-level scientists in Dr. Salazar's organization to air her complaints. These leaders initiated a formal investigation into the charges. By this time, the two investigators no longer trusted one another and their collaboration came to a halt.

- How might the leader co-create a **compelling vision, integrative team tasks, and provide an enabling structure?**

Tip # 2: Team Debriefs

Reflexivity, Perspective seeking, Learning

What are team debriefs?

- A structured intervention whereby teams are able to learn from their experience
 - Active self-learning: Engage in some form of active involvement; are not passive recipients
 - Developmental intent: A clear, primary intent for development or learning that is non-punitive rather than judgmental or administrative
 - Specific events: Reflection on specific events rather than general performance
 - Multiple information sources: Includes input from multiple team members

What does team debriefing involve

- Set the stage
 - Why are we here (What is our focus?)
 - Ask the team for observations
 - What happened?
 - What did we do well?
 - What were our challenges?
 - What could we do differently next time?
 - What could help us be more effective?
- Leader adds observations and recommendations
- Action Plan

Reflexivity

- A process by which the team engages in explicit and purposeful reflection on the team's experiences, knowledge, strategies, and progress toward goals in order to change or adapt one or more aspects of the team's working methods
 - Facilitate knowledge of who knows what (transactive memory)
 - Encourage self awareness and other awareness
 - Facilitate psychological safety and trust
 - Facilitate learning
 - Facilitate knowledge integration

Perspective-seeking

- Respectfully and actively seeking out the viewpoints of team members.
 - Gain an understanding of diverse sources of knowledge
 - Enhance the use of varied cognitive capabilities of team members
 - Enhance trust and psychological safety
 - Enhance openness to other ways of knowing and thinking
 - Enhance learning

Psychological Safety

- **Psychological safety** is a **shared perception** among team members indicative of an interpersonal climate that **supports risk taking and learning** (Edmondson, 1999).
 - Work engagement and commitment
 - Organizational citizenship behavior
 - Fosters social exchange / information exchange
 - Promotes learning behavior
 - Reduction of errors
 - Fosters innovation and creativity
 - Facilitates knowledge creation

How leaders can encourage reflexivity, perspective-seeking, and learning

- Make it an explicit priority
- Model the behavior you want
- Encourage discussion of errors /things that have not gone so well
- Create an environment of experimentation and exploration
- Facilitate everyone speaking up
- Establish norms for how failure is handled
- Embrace productive conflict

Case discussion: It's not working

- Dr. Polczyk conducts monthly meetings to discuss experimental data, interpretations, and next research steps. The meetings are largely perfunctory in nature. It is expected that they occur, but minimal effort or enthusiasm is invested. At these meetings, the presenter is rarely asked to clarify their data and is seldom asked questions. The discussion is brief and everyone seems to be eager to get back to their own work. When questions are asked, the presenter is usually defensive and guarded in what they share with the broader group. There are rarely questions that challenge a presenter's interpretation of the data.
- How might Dr. Polczyk encourage **reflexivity, perspective-seeking, and learning?**

References available at



Don't miss ISCE Team Science Workshop 3

- **Workshop 3: Managing Difference and Conflict in Cross-disciplinary Research Teams** (Friday, April 12, 2023 from 10:00 - 11:30 a.m. via Zoom)