Team Training for Team Science: What We Know Works & A Way Forward

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Outline

I. Why do Interdisciplinary Research Teams Need Team Training?

II. What is Team Training?

III. What are Best Practices for Team Training?

IV. What Can We Leverage Now?

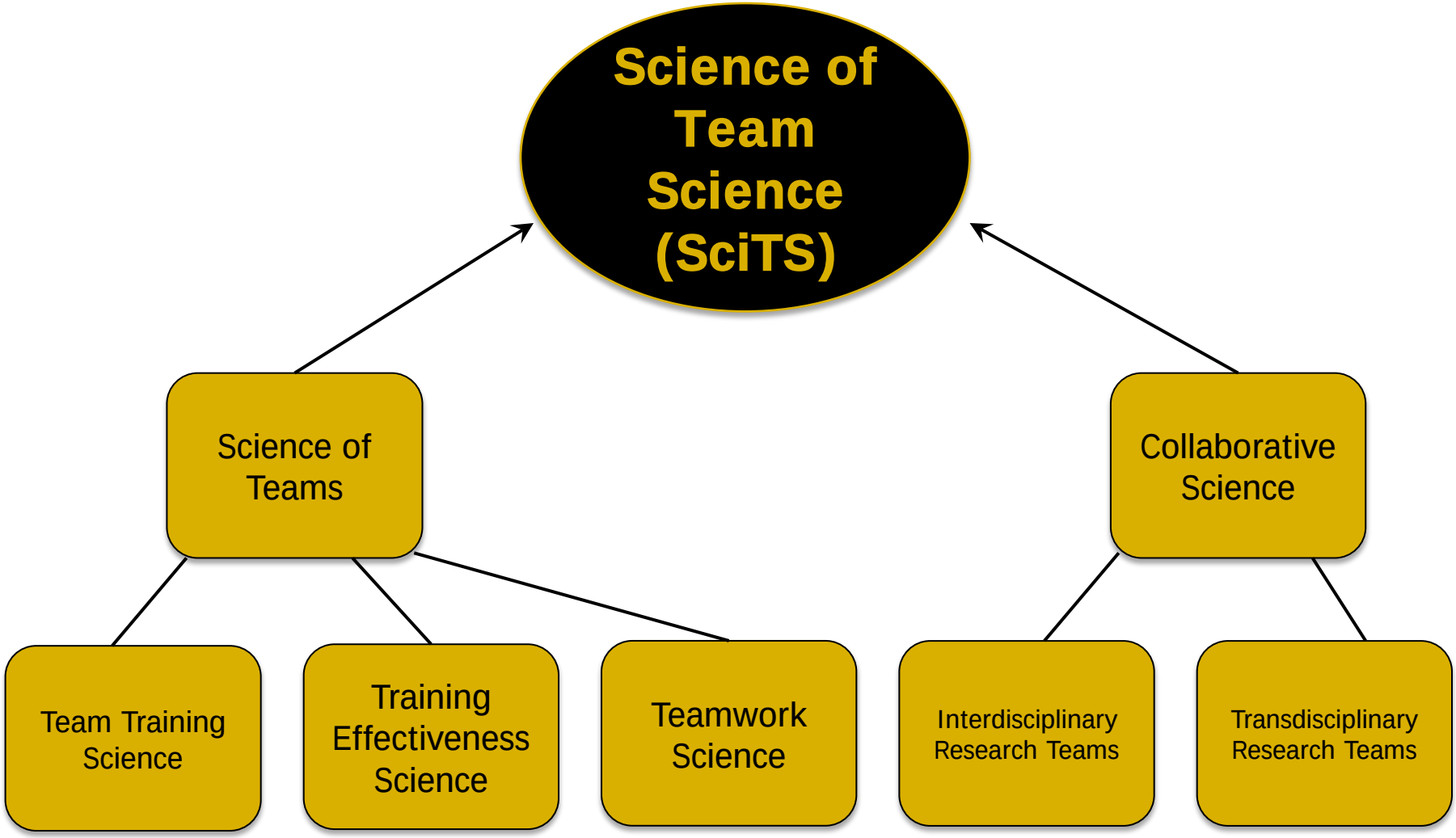
V. What Needs to be Done?

I. Why do Interdisciplinary Research Teams (IRTs) Need Team Training?

Why do Science Teams Need Team Training?

- Interdisciplinary research is **team research**
- **Strategies** for increasing longitudinal IRT success are **needed**
  - Current strategies are successful for the short-term
  - Once IRTs are funded, they work individually
- **Hurdles** for IRTs:
  - Geographically distributed
  - Distributed expertise
  - Time & funding
  - Shared understanding, goals

Current Literature Review



A Word on Teams...

- Driving question:

How do we turn a team of experts into an expert team?

- Explosion of empirical work!
- Studying real teams; performing real tasks
- Teams defined
  - Task interdependency
  - Distributed expertise
  - Hierarchical organized

A Word on Teamwork...

Ten characteristics of effective teams...

1. Have clear **roles** & **responsibilities**[1]
2. Driven by compelling **purpose** – goal, vision[2,1]
3. Guided by team **coach** (**leader**) – promotes, develops, reinforces[1]
4. Have mutual **trust** – familiarity[3]
5. Develop team **norms** – clear, known & appropriate[1]

A Word on Teamwork...

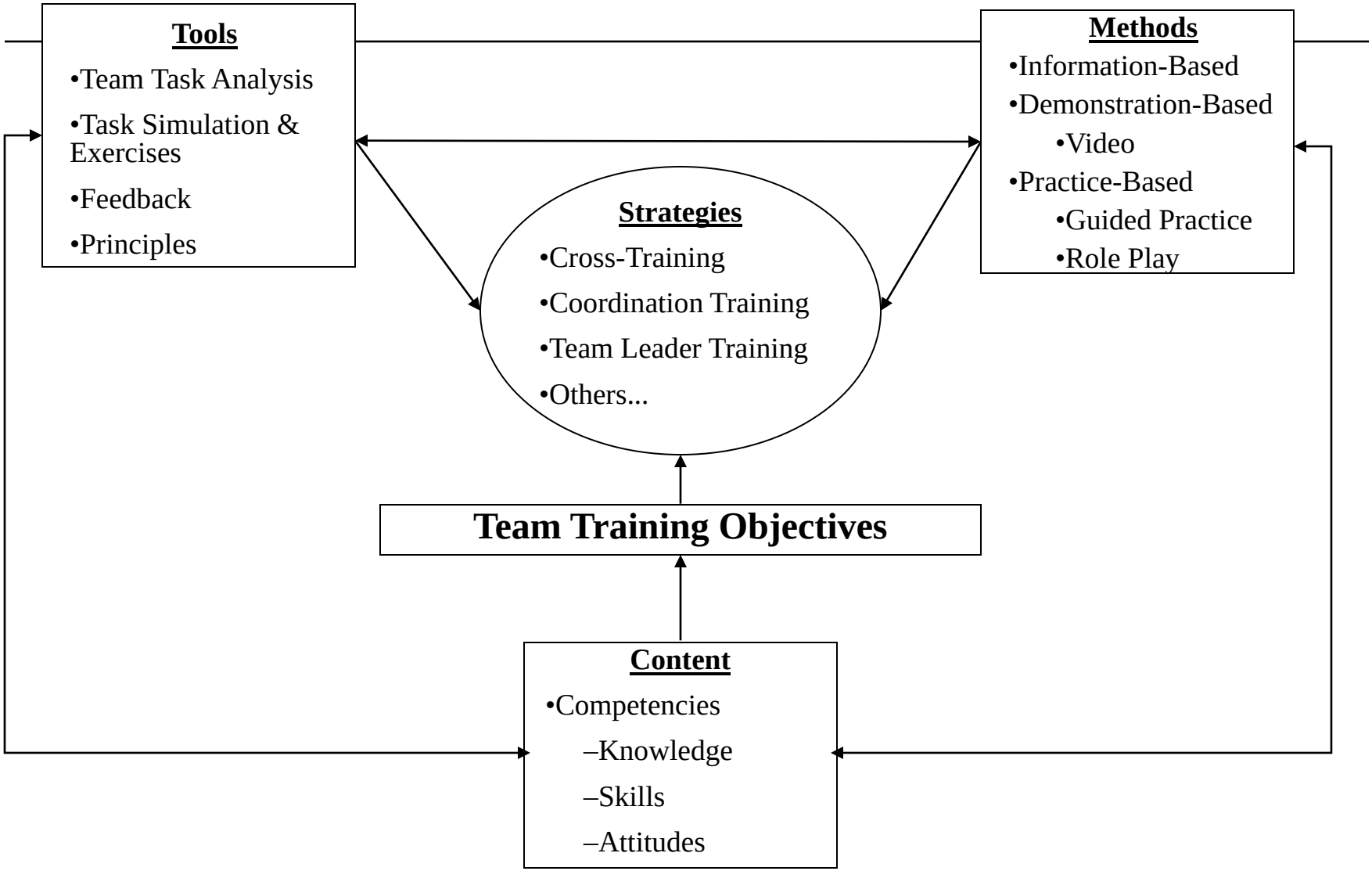
6. Hold **shared understanding** of task, mission & goals – hold shared mental models[4]
7. They **self-correct** – huddles, debriefs[5]
8. Set **expectations** – clear, understood[6]
9. Shared **unique** information – efficient information protocols[6]
10. Surrounded by optimal **organizational conditions** – policies, procedures, signals

II. What is Team Training?

Team Training is...

- "a **set of instructional strategies** and **tools** aimed at enhancing **teamwork** knowledge, skills, processes, and performance" [7]
- A **systematic** process
- Long history:
  - Healthcare, oil
  - Military, nuclear
  - Aviation, NASA
  - Corporate world (team building)
- Different strategies
  - CRM/Team coordination
  - Team leader
  - Team self-correction
  - Cross-training
  - Simulation-based team training

The Anatomy of Team Training



Does Team Training Work?

- Team training results...
  - In military, **25-45%** performance improvement[9]
  - In aviation, **10-34%** improvement in team coordination[9]
  - In medical, over 60 evaluations done
    - VA: **18%** reduction in **mortality**[23]
    - Iraq: **83%** reduction in medication and transfusion errors[5]
    - Labor & Delivery: **47%** decrease in Adverse Outcomes Index (AOI) for gestations under 37 weeks[10]
    - Improves clinical outcomes
- Team training can **explain 20%** of the variance of a **team's performance** [8]

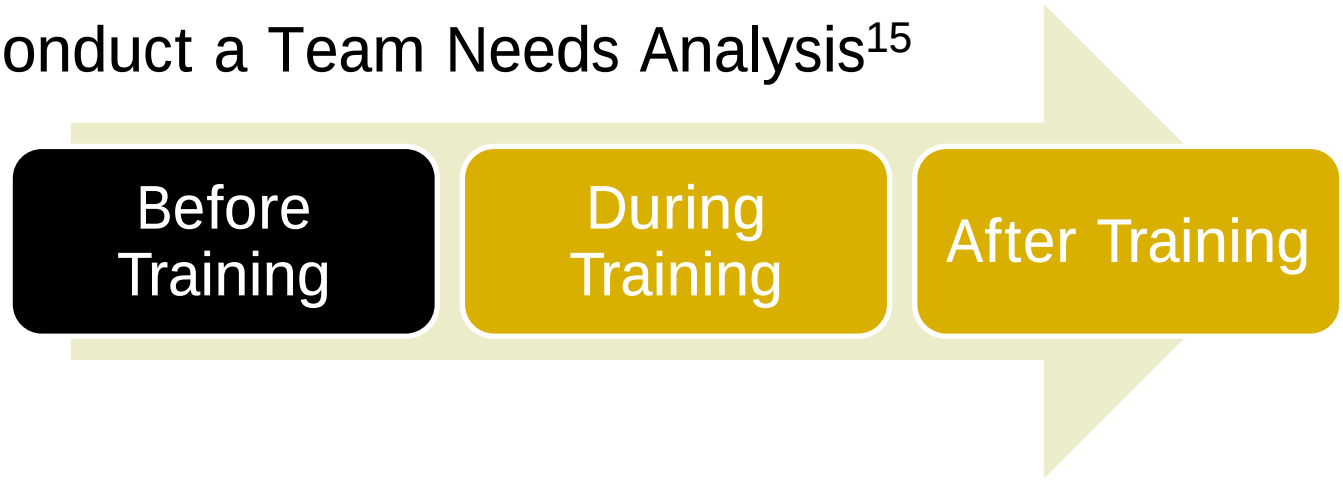
Team Training Works When...

- Focused on **teamwork knowledge**, **skills**, and **attitudes** (KSAs) necessary for effective team functioning
- Provides opportunities to **practice** these KSAs
- Trainers give **feedback** to **diagnose** teams regarding their ability to use the KSAs
- **Tools** are provided to improve **transfer** of team training
  - Debriefs
  - Coaching
  - Checklists

III. What are Best Practices for Team Training?

Before Team Training...

1. Consider Your Trainee[11]
2. Create a Team Training Environment Conducive to Training Goals[12]
3. Create a Supportive Learning Environment[11]
4. Create Teamwork Conditions that Support Transfer of Training[13]
5. Conduct a Team Needs Analysis[15]



During Team Training...

6. Develop Content for Team-Focused Training[14]
7. Utilize Appropriate Content Delivery Methods[15,16]
8. Provide Team Development Aids[17]

After Team Training...

9. Evaluate Team Training[18,15,13,19]
10. Promote Transfer of Team Training[20]

IV. What Can We Leverage Now?

1. Perform Translation!

- There is an existing **large** body of **knowledge**...
  - Cooperation, coordination, & communication
  - Teamwork, team performance
- Create **repository** of what we know, what works, and how to self-correct
- Develop an accessible, easy-to-use **evidenced-based** tool for science teams

2. Develop Tools for Collaboration!

- Checklists, tips advice, guidelines
- Focus on team leaders, team members, institutions
- Examples:
  - How to debrief?
  - How to self-correct?
  - How to resolve conflict?
  - How leaders should behave, think?

3. Adapt Existing Team Training Curriculum!

- TeamSTEPPS[21], in example
  - Medical focus
  - 8 hours of instruction
  - Free!
- Changed, modified, expanded, shortened
- Used now in...
  - K-12
  - Law enforcement
  - Many disciplines in healthcare

4. Start Educating and Preparing Institutions!

- Knock-out items 1-3
- Conduct workshops across country
- Test these! Natural experiments with new and existing science teams
- Educate research departments
- Create/adapt curriculum for scientists and graduate students
- Build curriculum for undergraduate – graduate student classes/projects
  - CATME[22]
- Provide advice on creating conditions for collaboration

V. What Needs To Be Done?

1. Build a Taxonomy of Science Teams

- A way to **organize** the **kinds** of science teams
- Help identify the nature of **task interdependency**
- Specify **KSAs** needed

2. Clarify and Understand What Facilitates and Hinders Science Teams (Deeper Dive)

- Studies of "**Science Teams in the Wild**"
- Identify the **optimal** level of collaboration readiness needed in educational & research institutions
- **New** team-based constructs may emerge

3. Develop a Web-Based or Transportable "Collaborator Dr." for Science Teams

- Leverage existing research, the repository
- "Online-help"
- A "Collaborator Dr." to help diagnose, fix issues
  - Advice of what to do
  - Evidence-based

4. Uncover the Specific KSAs Needed for Science Teams

- What competencies might be needed?
- Are they different from what we know?

Concluding Thoughts

- We know enough to start helping...
- More needs to be done, of course...

How can we help?

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Thank You For Your Time!

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