

A Developmental Evaluation Framework for Transdisciplinary Teams and Institutes



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Developmental Evaluation Framework

Developmental evaluation emphasizes iterative learning and continuous feedback, enabling teams to refine their approaches in real time (Patton 2010). This is vital in environments where initial hypotheses and methodologies might change significantly. The team scientist plays a crucial role in driving the project's success.

Team scientists facilitate continuous learning and adaptation, ensuring the team remains agile and responsive to new insights and changing research landscapes. We employ qualitative, quantitative, and social network methods, providing a comprehensive assessment that captures the complexity of the team's dynamics and research outputs.

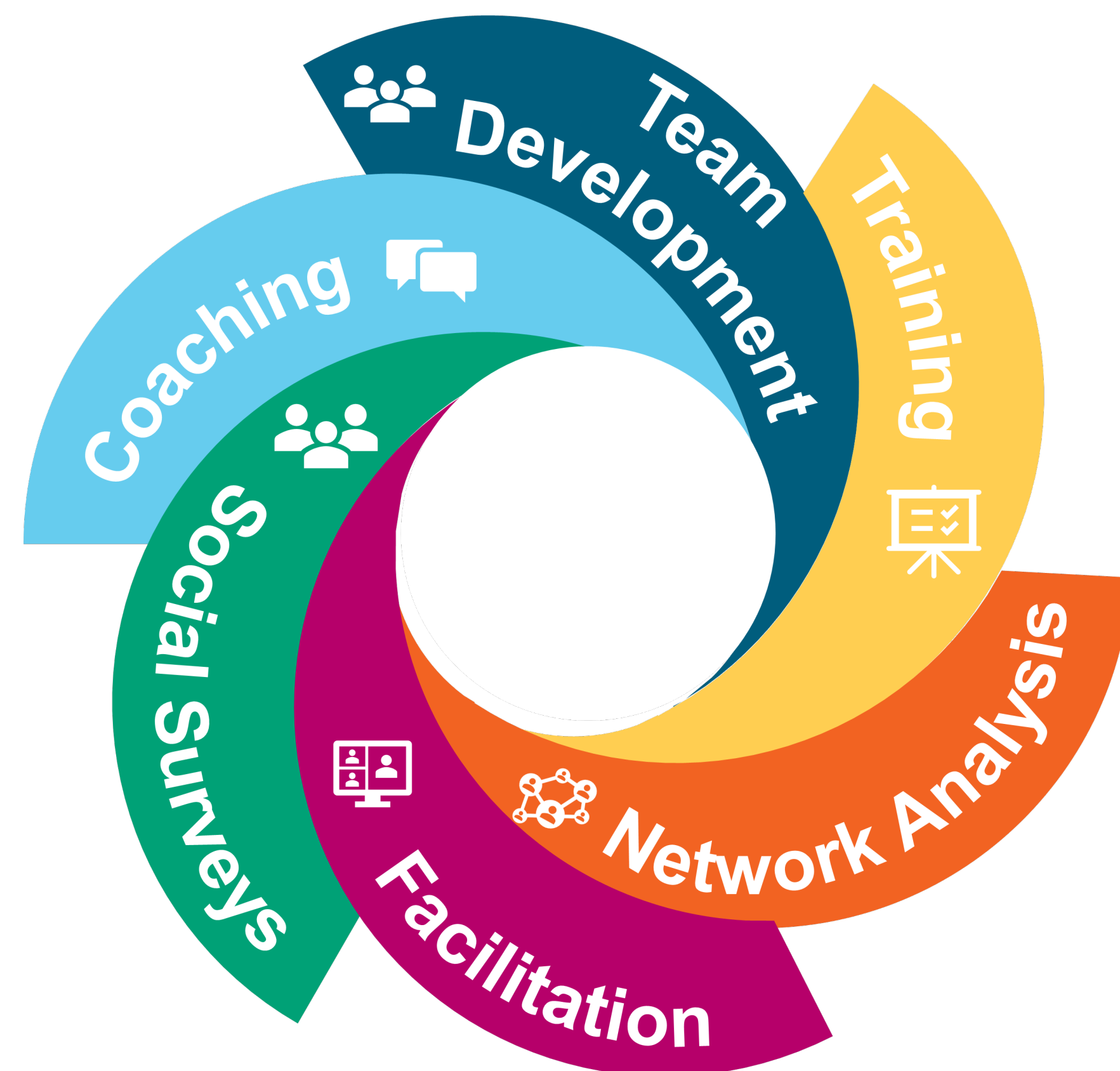


Figure 1. Developmental Evaluation Framework for Team Science

"Each time I participate in a team science training, I think, 'it would have been so great to have learned this when I was in grad school or my first years as an assistant professor'."

-Virginia Rich, Co-Director BII EMERGE

Team Development Ladder

Team Scientists focus on team development and growth, attending to team relationships, structures and leadership.

Using the social science literature, Team Scientists hold regular check-ins, monitor team growth, suggest evidence-based interventions, and host training sessions designed to meet the specific needs of each team.

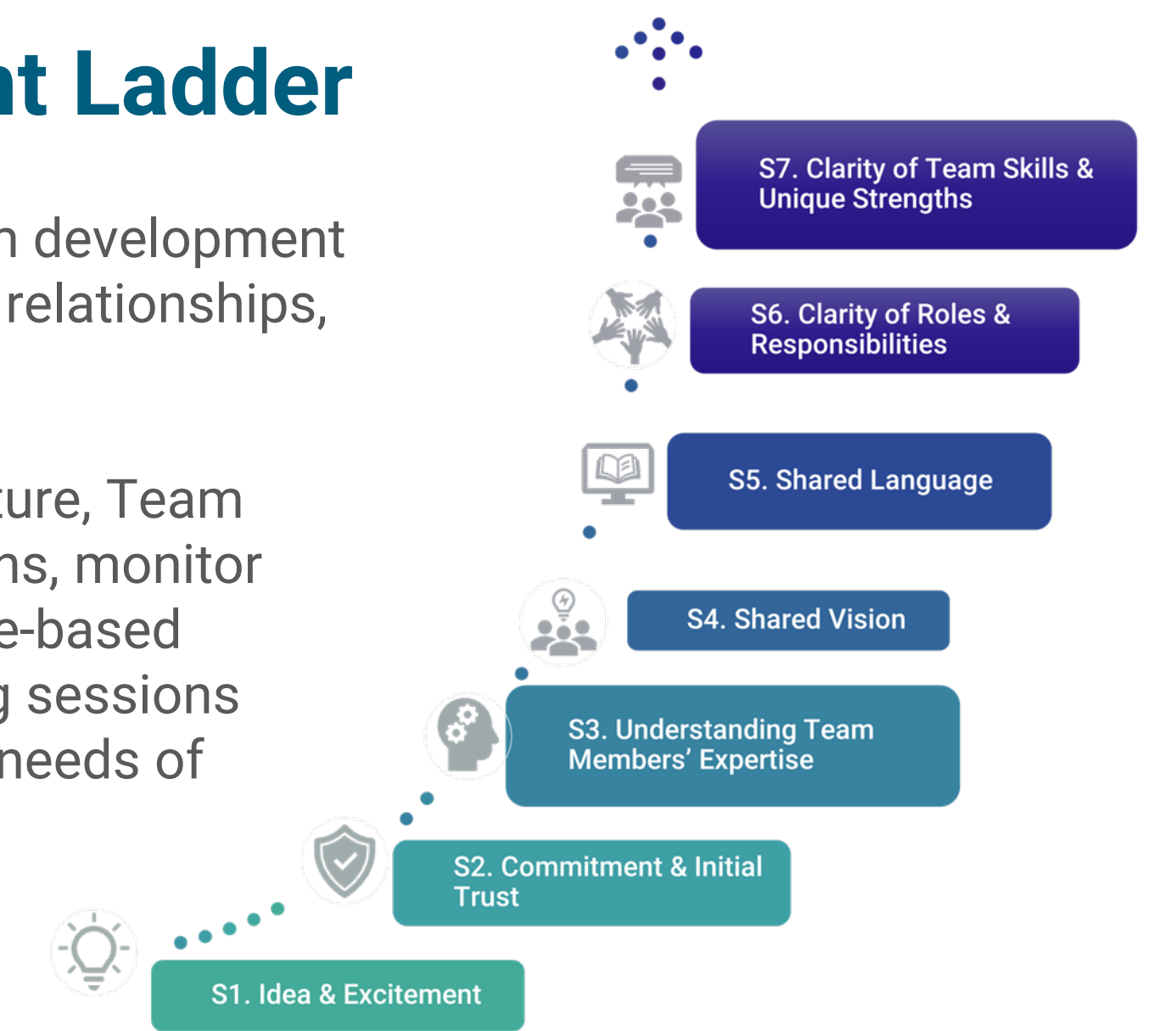


Figure 2. Team Development Ladder (Source: Cross, Jablonski, Schipanski 2021)

Team Effectiveness Year 1

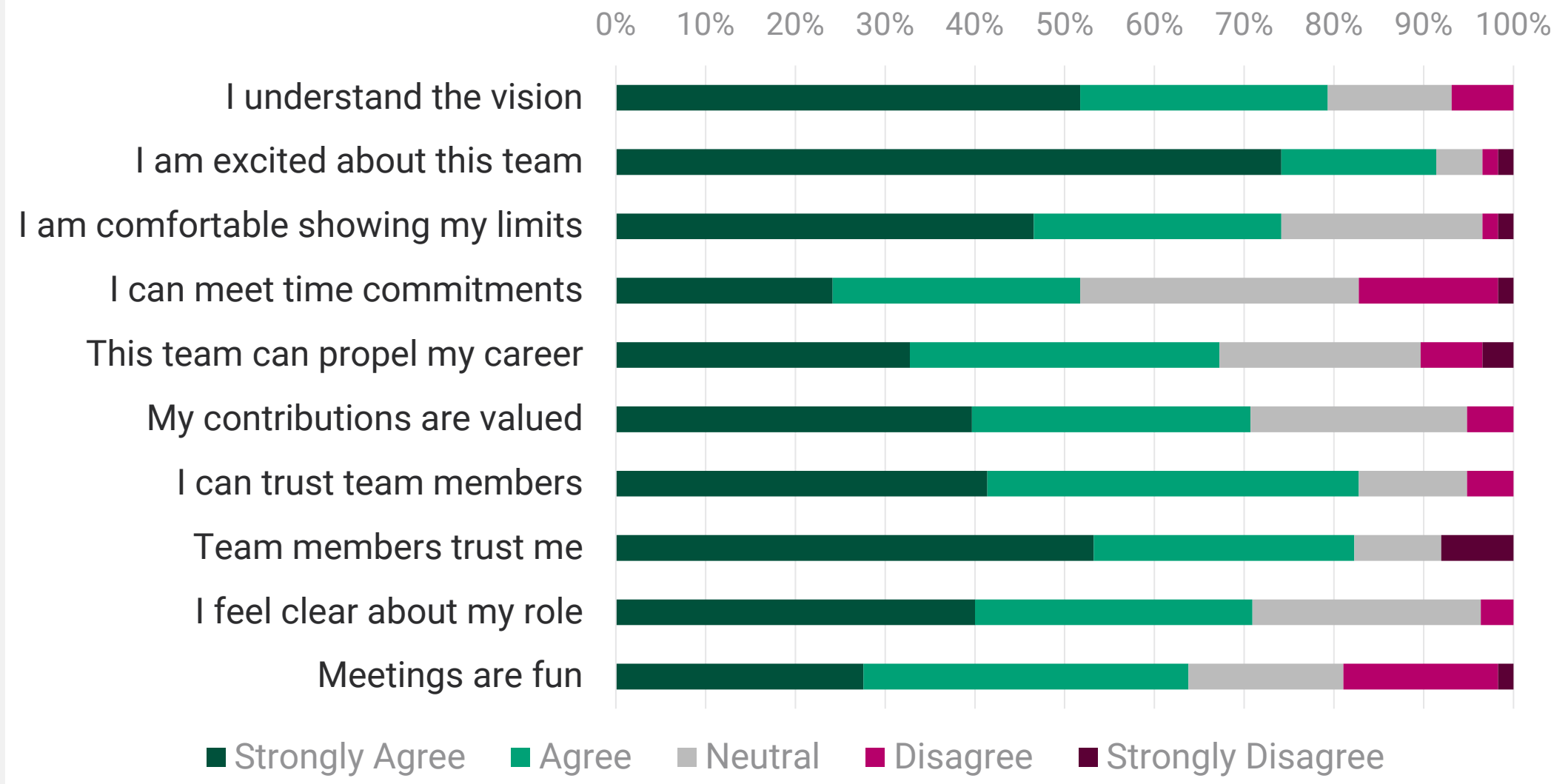


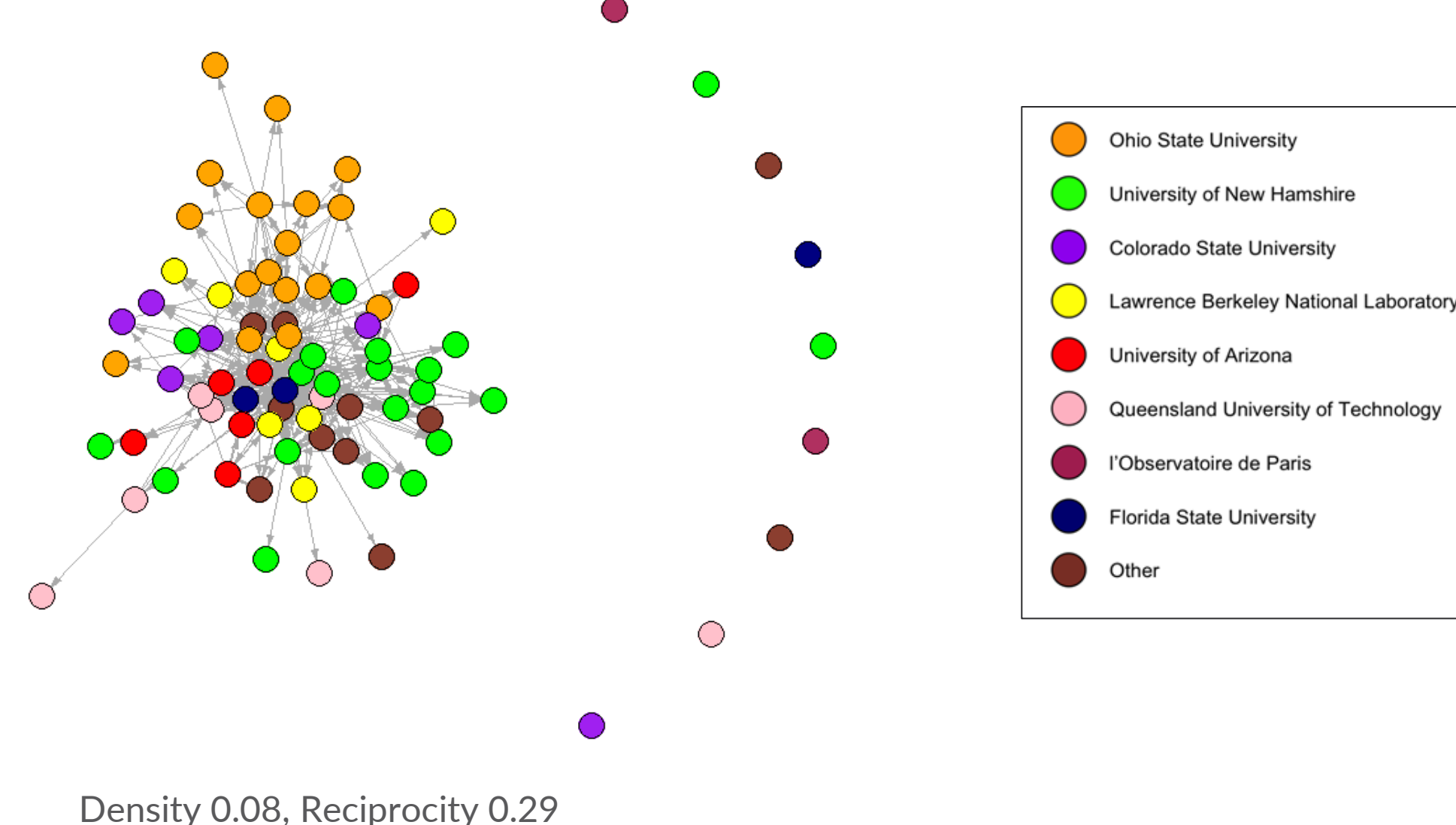
Figure 3. Teaming Readiness Survey Sample Results

Social Surveys

Social Surveys can measure an individual's or team's capacity for collaboration, and survey results help identify what kinds of team interventions will be most helpful to address current challenges or foster growth.

The Teaming Readiness Survey (Figure 3) focuses on measuring a team's capacity and effectiveness.

2021 Advice Ties



2022 Advice Ties

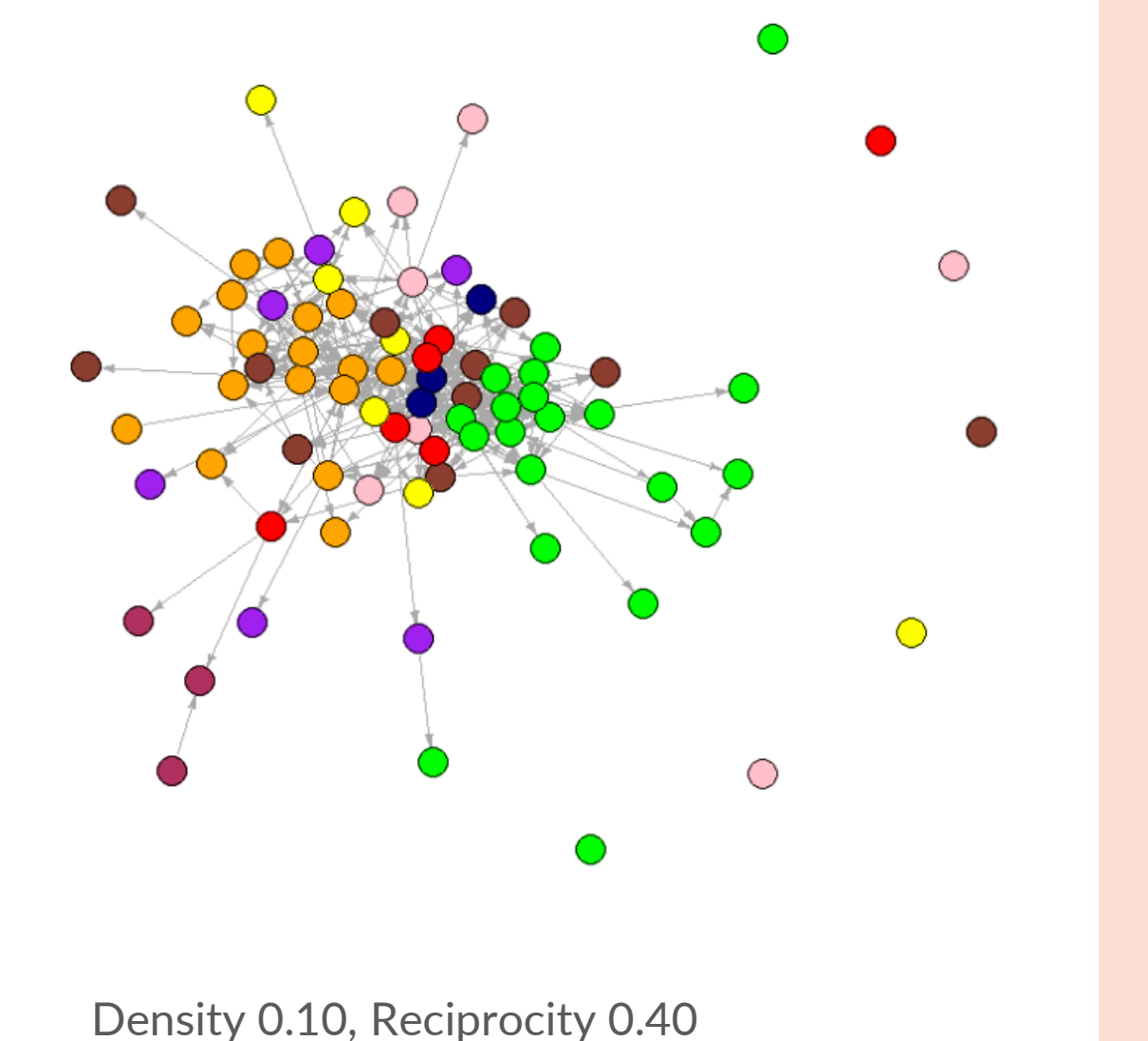


Figure 4. Social Network Analysis of Advice Ties in EMERGE BII by academic institution

What enhances a team's creativity and productivity?

- Third-party facilitators
- Structured ideation sessions
- Having FUN 😊
- Building personal relationships and trust
- Even turn-taking

Team Scientists can serve as facilitators, whose focus on team dynamics and application of teaming best practices, rather than contributing to the science.



Figure 5. Team Facilitation in Action

Social Network Analysis is an essential tool for team evaluation and assessment.

1. **Mapping Collaborative Relationships:** Network data can illustrate the relationships and interactions within a team, identifying how team members are connected, and revealing potential gaps in collaboration.
2. **Identifying Influencers and Key Players:** Social network analysis can identify individuals who play key roles in the team, such as opinion leaders, information brokers, or connectors.
3. **Assessing Interdisciplinary Integration:** Social network statistics can measure integration across a team, showing whether there is effective collaboration across disciplines, labs, demographic groups or sub-teams. Identifying connections and gaps can guide efforts to improve integration.
4. **Understanding Team Evolution:** Using longitudinal analysis, network analysis can track how team structure and relationship changes over time. We use this to highlight integration of new members and document team evolution.
5. **Facilitating Targeted Interventions:** The results from social network analysis provides a detailed understanding of the team's collaborative structure and can inform specific team interventions, designed to strengthen weak links, enhance collaboration, and improve overall team performance.

Team Science Training is designed to advance the teaming and collaboration skills of all members of transdisciplinary teams, from senior scientists to first year students.

Workshops are designed using active learning exercises to advance a specific teaming competencies such as perspective taking and developing shared language as defined in recent Science of Team Science publications.

Effective teaming does take skill, and sadly, many of the competencies for team science are not typically taught in doctoral programs.

Team Science competencies can all be LEARNED!!

Team science training fills the gaps to build strong teams through hands-on training.

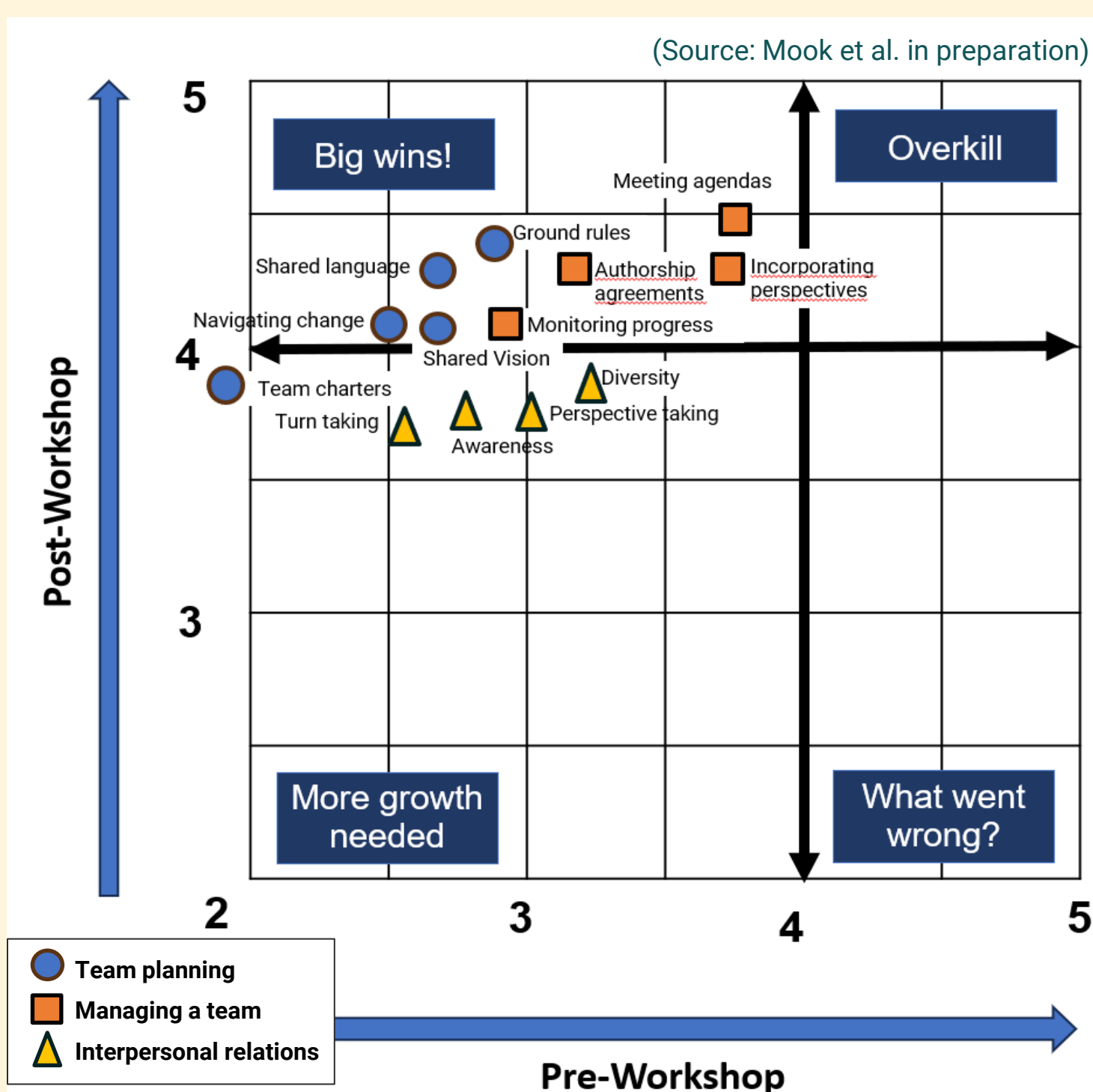


Figure 6. Team Science Workshop Series Evaluation Results

What is unclear?				What is not working?			
Decisions making	Expectations from leadership	The value of our paper	I can not familiar with some of the language	Working time with the project being unclear	Learning about a new concept	Building effective relationships	Being in different time zones
+1	+1	+1	+1	-1	-1	-1	-1
What is missing?				What is right (going well)?			
Our roles and responsibilities	A timeline	Communication between group	A good description of how our work contributes to the literature	Internal to the project	Communication between group	External about other's expertise	Opportunity to make new connections
+1	+1	+1	+1	+1	+1	+1	+1

Figure 7. Four Questions for Coaching and Managing Teams

Coaching Teams and Leaders

The larger scientific teams become, the more complex they are to lead and manage. Most scientists at academic institutions have received very little, if any, leadership coaching or team management training.

The field, Science of Team Science, grew out of the need to study teams in scientific settings and uncover their unique challenges and needs. Some tools for managing teams come from the existing fields of project management and research on teams. And yet, science teams also need specialized tools and practices adapted to their unique context.

Team Scientists are leading the effort to develop team coaching practices designed specifically to advance the skills of team leaders. (Hall et al. 2019; Jiang et al. 2023)

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