Collaborative Dynamics, Change Activities, & Collective Outcomes in Multi-Organizational Reform: A Conceptual Evaluation Framework

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Higher education reform increasingly relies on large-scale, multi-institutional collaborative initiatives
  ○ **HUGE** focus within STEM

Projects are complex and “messy”

Difficult to determine what impact a collaborative/collective approach has on desired outcomes

“Classical” evaluation methods unable to address such complexity

The **purpose** of this paper is to advance a conceptual, literature-based evaluation framework that demonstrates the interrelationship and importance of evaluating:
  ○ how a multi-organizational reform initiative functions (i.e., collaborative dynamics),
  ○ what the initiative does (i.e., change activities),
  ○ and collective outcomes.
“Classic” Program Evaluation

- Assumption that programs are stable and predictable (or even controllable…)
  - Did X cause A, B, C?
  - Focus on and measurement of summative effect
- Linear progression of outcomes/impact
  - Demonstrated through left-to-right logic models & often theories of change
- STEM education reform has utilized this “classic approach” for decades
  - Hire an evaluator (often summative/external), determine if project goals were accomplished
- Yet, “wicked” problems, like undergraduate STEM reform, are extremely COMPLEX
Move to a Systems Approach

- Movement towards collaborative reform initiatives to replace siloed/ineffective efforts
  - Underlying assumption: more change occurs through collaboration than working alone
- However...
  - “Even though evaluators may acknowledge the dynamic and interconnected nature of the complex systems that evaluated programs function within, many evaluators are unsure how to take these dynamics and interconnections into account and thus continue to use evaluation strategies and practices based on a static, mechanistic, and isolated view of the program.” (Moore, Parsons, & Jessup, 2019, p. 78).
  - The assumed change mechanism (collaboration) is often ignored or under resourced in its development/evaluation
- In response...A push towards developmental, formative, and systems-based evaluation
- To evaluate the success of collaborative change, it is critical to evaluate the system elements/linkages of collective reform:
  - Collaborative dynamics
  - (Aligned) activities
  - Collective outcomes
Collaboration → Reform Activities "?"

Reform Activities ← Outcomes "?"

Collaboration ← Reform Activities "?"
Tiered Evaluation Framework

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How a STEM reform initiative functions...

- Motivation
- Group Norms & Processes
- Support Resources
- Leadership

Affects what the initiative does...

- Individual
- Organizational
- Structural
- Relational
- Contextual

Which influences what the initiative can accomplish.

- Short
- Medium
- Long
Collaborative Dynamics

● **Genesis**
  ○ Development of measures of collective impact in a NSF-funded project
  ○ Literature review of collaboration in multi-sector and multi-institutional initiatives

● **Key Parameters** *(Dimensions of Collaboration Framework)*
  ○ Motivation
  ○ Group Norms and Processes
  ○ Support Resources
  ○ Leadership
Reform Activities

○ **Genesis**
  ○ Prior work investigating the impact of a large STEM Network (CIRTL)
  ○ Hill et al., 2019; Hill, 2019

○ **Key Elements**
  ○ Individual
  ○ Organizational
  ○ Structural (and Logistical)
  ○ Relational
  ○ Contextual
Initiative Outcomes

- **Genesis**
  - Long-time member of the research & evaluation team of CIRTL
  - Applying the systems evaluation protocol (SEP) within CIRTL, “messy” pathway modeling

- **Key Components**
  - Short
  - Medium
  - Long
  - Relationships between outcomes
  - Feedback loops to activities/collaboration
Implications

- Chance to slow down and examine the holistic levels of evaluation...not just programmatic impact
- Collaborative dynamics can contextualize and frame activities and outcomes
- Establish collaborative effect on reform initiatives
- Diagnose areas and ways to improve initiatives

Future Work

- Examine the evaluation framework elements within multiple reform initiatives
- Explore statistical models to examine the interrelationships of the three elements
Transitioning to papers #2 and #3....

Collaborative Dynamics

How the STEM reform initiative functions....

Aligned Activities

affects what the initiative does....

Collective Outcomes

which influences what the initiative can accomplish.

Paper 1: Framing

Paper 2: INCLUDES Case

Paper 3: CIRTL Case
Evaluating Collective Impact in the CIRTL
INCLUDES Pilot Project

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Collective Impact as a Model for Collaboration

Evaluation of Collaboration
- Intentional learning about CI processes
- Continuous learning within project through regular data feedback cycles
- Assessment of progress as well as outcomes

Evaluation as Collaboration
- Evaluators embedded within each project team
- Close coordination with teams to understand their data needs and build awareness of value of evaluation
- Co-creation of needs assessments and surveys to advance teams’ work
Key Elements of Collective Impact (CI)

Collective Impact provides a framework for organizations to align and coordinate as a new system to address complex problems in a way that encourage emergence of innovative solutions and dissemination of effective practices. Key elements for the framework are:

- Common agenda
- Mutually reinforcing activities
- Shared measurements
- Continuous communication
- Backbone infrastructure
What do we want to learn from evaluation of CI?

Using a developmental approach, we have asked 3 primary questions to evaluate Collective Impact processes, activities, and outcomes:

1. Did it occur?
2. How did it occur?
3. What was its quality?
   a. Was it aligned with the common agenda?
   b. To what extent were the project members engaged and committed to the work?
   c. Did it mutually reinforce other activities in the project?
   d. Was it evidence-based, actionable, and feasible?
Our CI Evaluation Model in CIRTL INCLUDES Pilot

Evaluation of Alliance Level
- Alignment of strategic goal activities
- Increased system-level capacity
- Establishment of internal connections
- Identification of external points of influence
- Development of backbone organization

Collective Impact Processes
- Establishment of norms
- Communication
- Decision-making
- Team dynamics
- Conflict resolution
- Collaborative governance

Phase II Activities
- Common agenda
- Needs assessment
- Research foundation
- Shared metrics
- Strategic planning process

Phase II Outcomes
- Research agenda
- Knowledge syntheses
- Strategic plans with metrics
- Action plans
- Evaluation plans

Evaluation of Strategic Goal Levels
The Practice of Collective Impact in INCLUDES Collective Impact?
### How do we measure Collective Impact?

<table>
<thead>
<tr>
<th>Alliance-Level Items</th>
<th>Team-Level Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Aspire Alliance agrees on a common problem.</td>
<td>We agree on a common problem.</td>
</tr>
<tr>
<td>The Aspire Alliance has shared goals.</td>
<td>We have shared goals.</td>
</tr>
<tr>
<td>Aspire Alliance members communicate effectively with each other.</td>
<td>We communicate effectively with each other.</td>
</tr>
<tr>
<td>Aspire Alliance members trust each other.</td>
<td>We trust each other.</td>
</tr>
<tr>
<td>The Aspire Alliance provides ways for all voices to be heard.</td>
<td>We provide ways for all team member and partner voices to be heard.</td>
</tr>
<tr>
<td>The Aspire Alliance make decisions collectively.</td>
<td>We make decisions collectively.</td>
</tr>
<tr>
<td>Leadership in the Aspire Alliance is effective.</td>
<td>Leadership in [team] is effective.</td>
</tr>
<tr>
<td>Partners (i.e., individuals and organizations) essential to the success of the Aspire</td>
<td>We involve essential partners (i.e., individuals and organizations) to advance the</td>
</tr>
<tr>
<td>Alliance are involved.</td>
<td>work of the [team].</td>
</tr>
<tr>
<td>The Aspire Alliance has identified strategies to achieve Alliance-wide goals.</td>
<td>We have identified strategies to accomplish our goals.</td>
</tr>
<tr>
<td>Aspire Alliance teams coordinate with one another to implement project activities.</td>
<td>We know how the goals and activities of our team fit within the Aspire Alliance as</td>
</tr>
<tr>
<td></td>
<td>a whole.</td>
</tr>
<tr>
<td>The Aspire Alliance has identified metrics to measure our success.</td>
<td>We have identified metrics to measure our success.</td>
</tr>
<tr>
<td>The Aspire Alliance has a clear plan to collect and use data to drive strategic</td>
<td>We have a clear plan to collect and use data to drive strategic improvement.</td>
</tr>
<tr>
<td>improvement.</td>
<td></td>
</tr>
</tbody>
</table>
Alignment of Collective Impact Metrics

Our measurement of CI in the NSF INCLUDES Alliance lies within multiple frameworks: Collective Impact, the CIRTL INCLUDES pilot, the NSF Collaborative Framework, and the theoretical Collaborative Dynamics framework.

<table>
<thead>
<tr>
<th>Alliance-Level Items</th>
<th>Team-Level Items</th>
<th>Framework Constructs</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Aspire Alliance agrees on a common problem.</td>
<td>We agree on a common problem.</td>
<td>CI: Common agenda</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CIRTL CI: Alignment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NSF: Vision</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>CIRTL CI: Communication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NSF: Leadership &amp; communication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CD: Interaction</td>
</tr>
</tbody>
</table>
What have we learned about the implementation of CI?

- Decision to use CI needs to be a collective decision
- Implementation takes time, commitment, and resources
- “Shared leadership” needs to be defined and practiced proactively
- Practice of CI sits at the intersection of multiple organizational cultures
- Equity and inclusion should be explicitly stated in order to confront systems of oppression
- Implementation is dynamic and iterative
What are our challenges?

● How should the project balance the work to produce program outcomes with the work to develop collaborative processes?
● How does the project develop and practice inclusive norms, including ones to address dynamics, positionality, and voice?
● How should equity and inclusion be defined by the project? How can these constructs be explicitly measured within the CI framework?
● How can we best use the organizational research on institutional mergers, large-scale collaborations, and shaping of new organizational cultures to enhance this project and inform other funded efforts to bring change initiative to a national scale
Evaluation Capacity Building Through Stakeholder Pathway Modeling of Local Programs in a Multi-Institutional STEM Future Faculty Development Initiative

American Evaluation Association, 2019

Mark Graham & Melanie Bauer
Yale University

Lucas Hill,
University of Wisconsin-Madison

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The CIRTL Network of 38 Institutions
Center for the Integration of Research, Teaching, & Learning (CIRTL)
University of Wisconsin - Madison

Founded in 2003, now 38 member institutions across the U.S. (NSF funding)

Impacts >5,000 “future faculty” participants annually through >100 Professional Development (PD) activities (e.g., workshops, courses, events) with goal to improve undergraduate STEM education.

Infrastructure. CIRTL Central at the University of Wisconsin. Each of the 38 institutions has a “local” institutional/campus leader. In-person network meeting every 6 months. Conference call once a month. Active leadership team.
State of Evaluation for the CIRTL Network

Evaluation of CIRTL needs to move towards assessing network-wide impacts

Currently:

- Collect annual reports from institutions (# and types of activities, # of participants, levels of participation)
- Most institutions conducting immediate, post-program surveys
- Some individual institutions studying their program impacts over the longer-term

The CIRTL Network desires a set of common measures to examine broader (cross-institutional) Professional Development training impacts over the short-, medium-, and long-term.

Network-wide information would be very useful to local programs as well, but they are limited in their capacity (time, resources, expertise) to collect this data.
Common Measures Across a Network Initiative? Potential First Steps towards the Solution

The CIRTL Network: a case study for using systems-based evaluation across a program network

Work at institution level toward creating network-level evaluation infrastructure

Evaluation capacity building intervention with two cohorts of local CIRTL leaders – a ground up, grass roots approach to common measures
Systems Evaluation Protocol

a.k.a. “the SEP”
Outcomes Analysis

Pathway Model ("Map")

Evaluation Plan

<table>
<thead>
<tr>
<th>Evaluation Question</th>
<th>Measurement</th>
<th>Sample/Participants</th>
<th>Design/Procedures (e.g., pre/post)</th>
<th>Data Management</th>
<th>Analysis</th>
<th>Reporting/Utilization</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

- Implement active learning in own class
- Lead a discussion section as a TA
- Use educational technology
- Write learning goals
- Understand implicit bias
- Learning Community
- TA Training Event
- Workshops
- Events
- Communities
- Changes in participant skills
- Implement in class
- Innovations in teaching
- Share ideas with colleagues
- ...attitudes
- ...knowledge
CIRTL Program Mapping with the SEP

Program & Staff Activities

- Workshops, events, and courses that compose the program and supporting administrative tasks

Short-Term Outcomes

- Direct results: changes in participants’ knowledge, skills, awareness, and attitudes

Medium-Term Outcomes

- Indirect results: changes in participants’ behaviors and practices

Long-Term Outcomes

- “Pie in the sky” goals: Accrued changes that impact the individual, community, department, institution, and society
Our Questions

What are the expectations and experiences of institution-level CIRTL program leaders as they participate in our SEP-driven evaluation capacity building intervention? Like it? Not like it? Helpful? Useful?

*Are we improving evaluation knowledge, skills, and attitudes?*

What are the expected program outcomes (spanning the short-, medium-, and long-term) shared across their institutions? Commonalities or unique aspects (or both)?

*Are local leaders better prepared to develop plans to measure mid- to longer-term outcomes?*
Over two years we worked as evaluation consultants with institution-level program leaders across two cohorts of CIRTL institutions (N=10):

**Cohort 1**
- Cornell University
- Johns Hopkins University
- Northwestern University
- University at Buffalo
- Yale University

**Cohort 2**
- Drexel University
- Iowa State
- University of Maryland
- University of North Carolina
- University of Texas-Arlington

At each institution additional participants invited by program leaders -- local CIRTL program stakeholders (e.g., evaluators, center directors, program staff)
● Each local program mapped their activities and expected short-, medium-, and long-term program outcomes (under guidance of a systems evaluation consultant) using simplified version of the SEP

[additions to the SEP]

● Because of cohort model, intentionally created evaluation-focused “communities of practice” that meet in-person biannually at network meetings to exchange/collaborate

● Using a subset of Cohort 1 program leaders to assist in co-facilitating the evaluation intervention with Cohort 2 (early success!)
Leader experiences

Formative feedback reported in stakeholder surveys/interviews at each stage:

1. after program mapping
2. after evaluation planning
3. after sharing maps/plans with other program leaders at a network meeting

Grounded theory and general analytical process used by Auerbach et al. (2018)
<table>
<thead>
<tr>
<th>Theme</th>
<th>Freq.</th>
<th>Example Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program</td>
<td>74</td>
<td>“To identify gaps in our programs”</td>
</tr>
<tr>
<td>Evaluation</td>
<td>41</td>
<td>“Learning more about program assessment”</td>
</tr>
<tr>
<td>Support/Affect</td>
<td>31</td>
<td>“More confident knowing I can reach out to someone”</td>
</tr>
<tr>
<td>Sharing</td>
<td>17</td>
<td>“Create some common language across CIRTL leaders”</td>
</tr>
<tr>
<td>General Work</td>
<td>15</td>
<td>“Good for collaboration and productivity”</td>
</tr>
<tr>
<td>CIRTL</td>
<td>4</td>
<td>“Rectify CIRTL core goals with what current projects doing”</td>
</tr>
<tr>
<td>Feedback</td>
<td>4</td>
<td>“Only downside was the overall time commitment”</td>
</tr>
</tbody>
</table>
Program outcomes

Analyzed program maps to identify “common outcomes” across maps \((n=6)\)

Coded for CIRTL and non-CIRTL (emergent) themes
## Program outcomes

Most common outcome codes across institutions’ program maps

<table>
<thead>
<tr>
<th>*Code</th>
<th>Map 1</th>
<th>Map 2</th>
<th>Map 3</th>
<th>Map 4</th>
<th>Map 5</th>
<th>Map 6</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career</td>
<td>33</td>
<td>13</td>
<td>14</td>
<td>4</td>
<td>22</td>
<td>4</td>
<td>90</td>
</tr>
<tr>
<td>EBT-1</td>
<td>14</td>
<td>17</td>
<td>16</td>
<td>10</td>
<td>13</td>
<td>5</td>
<td>75</td>
</tr>
<tr>
<td>LC</td>
<td>8</td>
<td>7</td>
<td>26</td>
<td>2</td>
<td>22</td>
<td>2</td>
<td>67</td>
</tr>
<tr>
<td>EBT-2</td>
<td>7</td>
<td>13</td>
<td>6</td>
<td>8</td>
<td>9</td>
<td>0</td>
<td>43</td>
</tr>
<tr>
<td>Culture</td>
<td>5</td>
<td>0</td>
<td>12</td>
<td>4</td>
<td>5</td>
<td>9</td>
<td>35</td>
</tr>
</tbody>
</table>

**EBT-1 & EBT-2 relate to evidence-based teaching; LC relates to learning communities**
**Example Outcome Codes**

<table>
<thead>
<tr>
<th>Example CIRTL Codes</th>
<th>Example Non-CIRTL Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe several assessment techniques and recognize their alignment with particular types of learning goals.</td>
<td>(Career) Improving job prospects, benefits for tenure and promotion.</td>
</tr>
<tr>
<td>Describe the scope of diversity in learning environments, of both students and instructors.</td>
<td>(Attitudes) Positive attitude and confidence related to teaching as a profession and/or teaching identity.</td>
</tr>
<tr>
<td>Describe several techniques and issues of establishing learning communities comprising a diverse group of learners.</td>
<td>(Discipline) Learn discipline-specific knowledge related to teaching &amp; learning.</td>
</tr>
</tbody>
</table>
Benefits to programs and the local leaders

- Mapping products (program map, evaluation plans); can “see” their program
- Accountability partner (i.e., project evaluators checking in)
- Bringing key local people together to collaborate
- Creating a collaborative learning community of CIRTL leaders (different program structures, post-meeting collaboration around evaluation between two institutions)
- A way to advance collective impact - i.e., compare maps with other campus groups to see how their programs fit in the larger whole and other institutional priorities and goals
Benefits to program network

- Local leaders (10 of 38) supported/trained in evaluation and a common language for evaluation (evaluation capacity building in the network)

- Evaluation-focused community of practice formed (and growing); in part due to existing CIRTL infrastructure

- For a subset of CIRTL programs, an identification of common outcomes that can support network-wide evaluation

- The potential for ramp up effect where many campuses trained in systems evaluation, which then has a means to identify common metrics

- A test bed to figure out complicated metrics for a complicated collaborative reform initiative

- National ripple effect and potential large-scale effect on STEM reform; CIRTL members are often part of much more than CIRTL
Challenges and risks

- Time and energy required by each program leader to participate.
- How to incorporate multiple program stakeholders’ perspectives into one program map.
- Multi-institutional evaluation projects: keeping the ball rolling on a project when the majority of work is facilitated remotely (i.e., online).
Lessons Learned

Reduce the mapping for large programs (i.e., map only a subset of their programs)

Go online first--have local leaders create their own program maps in the online program Mural (vs. paper and pen later digitized by evaluator)

Frequent check-ins move the project along (especially in evaluation planning and execution phases)

Semi-structured, informal cohort meetings allow for community building and cross-institution sharing (vs. rigid, highly structured set of activities)

May be useful to have cohorts matched for a similar stage of program development (though pros/cons of each format)
Conclusions

Institution-level program leaders benefiting both in program development and evaluation planning from this evaluation intervention, also appreciate the support and guidance from evaluation consultants.

Several activity outcomes are candidates for “common measure” instrument development (at least across the first 5 CIRTL institutions), but also significant institutional variation.
Institution-level program leaders invite additional stakeholders to engage in the evaluation process. Cross-institutional sharing and collaboration.

Map of program activities
Share activity maps with other program leaders

Map of short-, medium-, and long-term outcomes
Share outcomes and evaluation plans with other program leaders.
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