

## **Getting Things Done in Data-Intensive Inter-campus Research Initiatives: A Social Network Analysis Approach to Understanding and Building Effective Relationships between Researchers and Other University Employees**

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## **Introduction**

It perhaps goes without saying that interpersonal relationships can make or break the success of complex educational research projects. Sharing a common understanding of a project's purpose and achieving trust between key personnel across a university is particularly challenging when those people come from widely different faculty, staff and administrative positions. Traditionally, faculty conduct their research without engaging staff and administration as peers with an equal stake in the outcome of their investigations. A recent NSF funded project, spanning three very different institutions (Purdue University, University of Texas El Paso, Cal Poly San Luis Obispo) took a different approach. Their strategic plan included identifying and enlisting the active participation of Student Affairs personnel in their project's implementation and data collection. Over the past three years, the PIs have been collecting deep student data, developing educational interventions and disseminating their research findings through traditional academic venues.

Explicitly acknowledging the importance of its personnel relationships, the project's external evaluation has gathered ongoing data about the communication between key faculty and staff stakeholders. The evaluation has focused on surfacing and making explicit targeted aspects of peer relationships that might otherwise have been taken for granted: levels of connectedness, trust and common understanding. Findings about the strengths and weaknesses of individual relationships were used to engage the PIs in formative reflections about how those relationships were impacting the momentum and success of their project.

As Patton has pointed out, a defining characteristic of evaluation is *“the systematic collection of information about the activities, characteristics, and outcomes of programs to ... improve program effectiveness, and/or inform decisions about future programming [1].”* The evaluation activities described in the following sections demonstrate a process that has implications for educational projects well beyond the three institutions where it took place.

## **Using Social Network Analysis to Reflect on Trust, Common Understanding**

### *Approach*

In developing the evaluation plan's focus on relationships, the PIs agreed to include five specific criteria for success:

1. The extent to which the PIs and their teams at each institution can obtain the data they need to develop and conduct their interventions.
2. The extent to which the interventions, once developed, are implemented with fidelity at each institution.
3. The extent to which the interventions become institutionalized.

4. The extent to which critical personnel across each institution advocate for the interventions.
5. The extent to which critical personnel across each institution “buy into” the project.

The PIs determined that Trust and Common Understanding between themselves and other university personnel were critical for achieving success across all 5 criteria. Trust is defined as the level of confidence that both parties have in each other and their willingness to open themselves to the other party. According to this operationalized definition, trust has three components: integrity or the belief that a person or organization is fair and just; dependability or the belief that a person or organization will do what they say they will do; competence, the belief that a person or organization has the ability to do what they say they will do [2], [3]. Common Understanding is defined as the extent to which parties both understand and agree with the strategic priorities of the project [4].

Evaluation activities included the construction of a Social Network Analysis to gather data on the 1st and 5th success criteria, specifically: the extent to which personnel at each institution are able to obtain data and conduct interventions, and the extent to which personnel at each institution “buy into” the project.

A Social Network Analysis (SNA) is a sociological method of analyzing networks of people, using nodes as the “actors” and edges as “ties” between the actors [5]. The SNA methodology is used in program evaluation for wide ranging projects [6] from public health [7], [8], to leadership [9], [10], and to education [11], [12]. For this project’s evaluation, the SNA was designed to measure the constructs of Trust and Common Understanding from the point of view of the project PIs at each institution toward Student Affairs and other staff whom the PIs had, or attempted to have, any communication with about the project during a specified period.

The SNA findings were represented by a set of directed network graphs representing the Trust and Common Understanding constructs at each institution. Nodes were labeled with the initials of faculty and staff who were involved in the project.

#### *How the findings were used*

The labeled graphs for each institution were shared with the PIs at that institution, such that they could reflect on patterns of relationships and individual relationships. Their reflections were deep and led to the PIs developing individualized personnel strategies designed to increase the project’s success. De-identified graphs were later shared among PIs at the three institutions. Two examples of these de-identified graphs are represented in Figures 1 and 2.

Figure 1 shows PI perceptions of Trust at one of the three project partners, a large research university (“Institution A”) with a diverse non-traditional student population. The university culture values shared decision making, group ownership of innovations, and places a high value on transparency and communication across departments and divisions. Upon reflection, the PI, represented by the green node, said that the SNA findings were consistent with institutional values such as high levels of trusting relationships campus wide. Even more specifically, the findings accurately reflected their relationships with Student Affairs personnel. The PI also

reported that frequent and mutual open communication led to the high levels of cooperation and buy-in they experienced on the project.

The PI at Institution A focused their reflection time on the relationships between themselves and the 5 people represented by connections in the Ambiguous Trust graph. Ambiguous Trust graph connections indicated either that the PI was unsure about how much to trust the person or that their level of trust was context dependent. The PI then reached out to each of these people in order to bring them further into the project in a way that would be mutually beneficial.

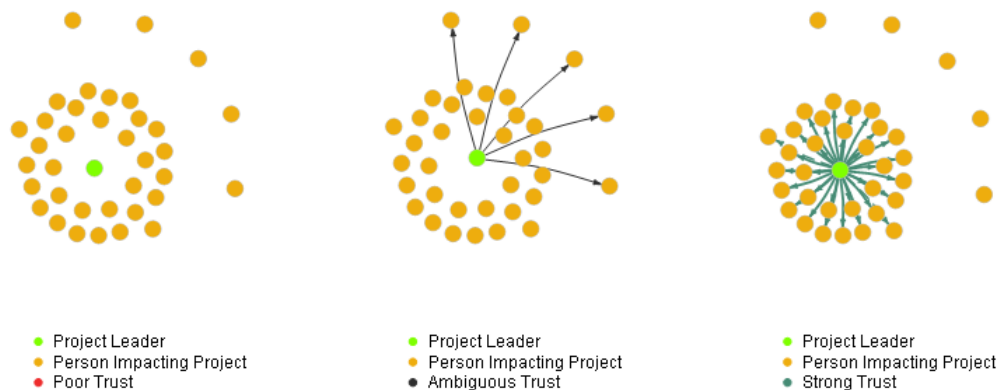


Figure 1. PI perceptions of trust at Institution A

Figure B shows perceptions of PI perceptions of Common Understanding at one of the other project partners, a large research university (“Institution B”) with a mostly traditional student population. The university culture values faculty autonomy and employee adherence to position descriptions; roles are typically well defined and a deep shared understanding is not necessarily required for completion of a task. When the 4 PIs reflected on the Common Understanding graphs they agreed that the graphs reflected their reality: each PI works primarily on the project with a small group that they know well. The PIs noted the large number of the people who are part of the project that they need to rely on but know less well (Ambiguous Common Understanding), indicating that they are unsure if they share a understanding about the project. In contrast to Institution A, the PIs at Institution B felt that having a strong degree of Common Understanding was not necessarily relevant to successful governance of the project. Thus the large numbers of connections in the Ambiguous Common Understanding graph was not as much a concern as were the people who were perceived as having a Poor Common Understanding of their project. Reflecting their institutional culture, the PIs viewed identification of these people as an opportunity to search for the most optimal ways to accomplish important tasks.

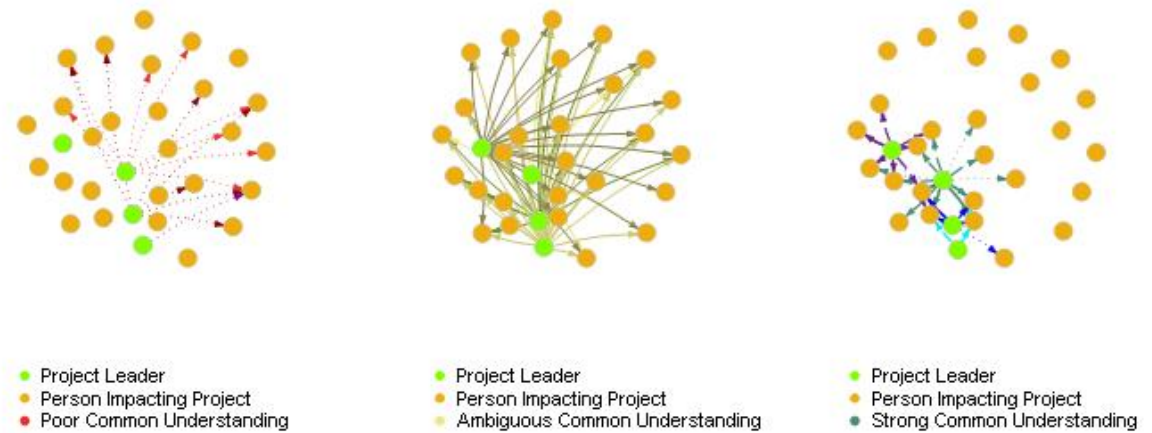


Figure 2. PI perceptions of common understanding at Institution B

Our intent in sharing the above examples is to show how the PIs engaged with the SNA findings to further the project’s success in a way that reflected their institution’s culture of “how things get done”. All of PIs at the three project universities reported anecdotally that the SNA graphs were a useful tool for better understanding and partnering successfully with other university personnel. The project teams agreed with the sentiment of Bergquist and K. Pawlak that, “we must determine how to work with and use the strengths and resources of the existing organizational culture to accomplish our goals [13].” In addition, the project teams approached the SNA findings about strength of Trust and Common Understanding from an asset based mindset; e.g. perceptions of Ambiguous or Poor relationships were not viewed as people problems to be “fixed”, but rather as opportunities to develop more effective relationships.

### Discussion: Increasing the Relevance and Impact

Although the PIs at each institution had insights and responses that were highly specific to their own personnel, all of the teams *implicitly* relied on an understanding of their own organizational culture. Although outside the scope of the evaluation to gather formal data on the role of each team’s culture, anecdotal information supports the observation that attempts to strengthen relationships were most successful when they aligned with cultural values and unstated views of “how things get done” on each campus.

This relational observation enables us to address the question: How does the experience and findings from this particular project apply more broadly to education researchers working on

other projects at other institutions? The challenge and the way forward are to identify findings that are informative at a level that can be used to guide change processes that are specific to different types of academic organizational cultures [14], [13]. Kezar and Eckel explain as follows:

The difficulty of working at the micro-level is becoming too specific and idiosyncratic to be of much help to others... Idiosyncratic observations are often of little use to practitioners. The challenge is to chart a middle ground and identify findings informative at a level that can be used to guide change processes. This task is challenging, because markers that one might use to determine the level of detail or the appropriate level of abstraction are not readily apparent. One solution to charting meaningful middle ground is through a cultural perspective [14].”

Our SNA approach was particularly successful at helping each institution’s PIs to understand micro-level personnel issues that needed to be addressed and to reflect on how trust and common understanding worked in their respective organizations. To find the middle ground referred to by Kezar and Eckel, one where findings taken at a micro-level also lead to meaningful change beyond the individual, we recommend that PIs who wish to partner with other university personnel on scalable educational research projects engage in a process that combines use of a formalized organizational culture assessment specific to academia [13] with an SNA analysis as introduced here.

We further propose that combining an *explicit* cultural study alongside micro-level data from a social network analysis will drive reflections to a clear understanding of the change processes that are a natural part of having a particular institutional culture and thus lead to generalizable findings across institutions with similar cultural profiles.

## **Summary**

The purpose of this multi-institutional project’s evaluation was to assess levels of connectedness, trust, and common understanding among project stakeholders and partners at each university. The evaluation focused on surfacing and making explicit targeted aspects of otherwise implicit interpersonal relationships: levels of connectedness, trust, and common understanding. Social network analysis graphs describing the strengths and weaknesses of peer relationships as perceived by the project PIs were used to engage them in formative reflections about how those relationships were impacting the success of their project. Incorporating an implicit understanding of their unique academic cultures, each set of PIs used their newfound insights to take targeted actions to increase institutional buy-in to their project.

It was outside the scope of the project’s evaluation plan to conduct a study of institutional culture. However, after reflecting on the evaluation findings, all three sets of university PIs felt strongly that the project would have benefitted even further from an investigation of the relationship between the SNA data and institutional culture. In fact, a subset of the PIs is currently integrating formal cultural analysis into other educational research projects.

Based upon the positive outcomes of this project's use of SNA graphs in supporting the success of the project, we hypothesize that conducting a more formalized and specific assessment of academic institutional culture - and incorporating those findings into asset based reflections of SNA data - will enable project leadership to achieve the highest levels of project success. It is our sincere hope that readers of this work (and viewers of the accompanying poster) will develop their own mixed method SNA - cultural analysis educational research studies and reflect successfully on the findings.

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