

Innovation Configuration Maps: A Tool for Guiding Team-Based Change Work in Higher Education

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The Department Action Team (DAT) model supports groups of individuals in creating sustainable improvements to education within their department. A DAT, consisting of department members and external facilitators, works collaboratively towards a shared goal. Using innovation configuration (IC) maps we study three DATs, exploring members' perspectives about their goals, work, and the process of actualizing goals. We examine the degree to which these groups perceived their alignment with the DAT model, and close with a discussion of how IC maps can be used as a tool to assess the alignment of team-based change work to change models.

Keywords: innovation configuration maps, department change, principles for change.

Meaningful and lasting change is a complex process that goes beyond the efforts of a single individual (Fisher & Henderson, 2018) and can often call into question strongly held beliefs and ingrained practices. Because deep-rooted institutional structures and cultural norms complicate educational transformation (Austin, 2011; Kezar et al., 2015), effective and lasting change must involve stakeholders collectively developing and working towards a shared vision to support and assess innovation efforts to improve STEM education (Henderson et al. 2011; Palmer & Giering, 2023). The Departmental Action Team (DAT) model is such a model that engages multiple stakeholders, taking into account both context and culture to enact and sustain change at the department-level (Reinholz et al., 2019).

The work presented in this paper was part of a larger project aimed to develop collaborative teams (DATs) to work on a local problem in undergraduate STEM education¹. As part of this work, Innovation Configuration (IC) maps in the form of a survey were developed to support DAT members to come together on the key characteristics of the DAT model. Assessing each DAT's alignment with the DAT model is essential for evaluating their change efforts. In this manuscript we explore the work of three STEM DATs and use IC maps to answer the following question: *What are DAT members' perceptions of alignment with the DAT model?*

Theoretical Framework: The Department Action Team Model and Guiding Principles

A DAT is a type of working group typically consisting of 4-8 department members (e.g., faculty, non-tenure track faculty, students, staff) and 1-2 external facilitators. External facilitators are typically individuals trained in group facilitation and may be part of an institution's Teaching and Learning Center. DATs work to make sustainable change by addressing an educational problem of broad-scale importance. Past DATs have focused on developing program-level outcomes, assessments, and studying student experiences for program improvements. A DAT's goal is developed through a shared visioning process (Reinholz et al., 2021), and the DAT meets regularly to enact a project related to the identified goal. The work of the DAT is guided by six core principles which reflect a synthesis of research grounded in organizational change and higher education literature (Quan et al., 2019, p. 010141-2):

¹ Go to <https://dat-project.org/> for more information about the DAT project.

1. Students are partners in the educational process (P1).
2. Work focuses on achieving collective positive outcomes (P2).
3. Data collection, analysis, and interpretation inform decision-making (P3).
4. Collaboration among group members is enjoyable, productive, and rewarding (P4).
5. Continuous improvement is an upheld practice (P5).
6. Work is grounded in a commitment to equity, inclusion, and social justice (P6).

Although Quan et al. note that “fostering departmental change requires more than principles alone” (e.g., readiness, resources, etc.; p. 010141-18), they acknowledge that when coupled with an effective model, such as the DAT model, a change initiative can be more effective. External facilitators use these principles to guide a DAT in their work as well as formatively assess a department’s shift in culture (Ngai et al., 2023; Reinholz et al., 2019).

Innovation Configuration Maps as an Analytical Framework

An IC map is an instrument intended to document and potentially quantify particular aspects of a change effort. Specifically, an IC map illustrates “different ways of getting from A to B” by summarizing “in words of the different ways the key components of an innovation can be made operational” (Hall & George, 2000, p. 3). In this manuscript we focus on an IC map of the six core principles of the DAT model. Each principle makes up a component of the IC map, and each component has variations that illustrate how that principle may manifest in a DAT. These variations illustrate degrees of alignment with the DAT model. For example, the P1 component is illustrated with its five variations in Figure 1². Variations of P1 that are aligned with the DAT model are listed first and are black, . The ideal manifestation of P1 is the first option, and the second is an acceptable variation that is still in alignment with P1. Those below are partially aligned (gray, ) or unaligned (red, .

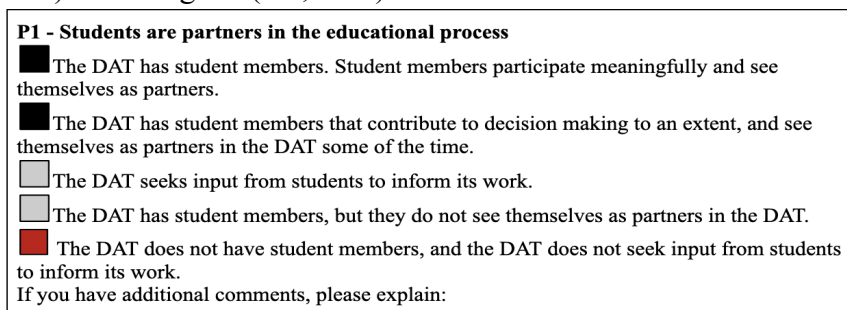


Figure 1. Principle 1 and its corresponding variations.

Methods

This study focuses on the participant perspectives from three STEM DATs: Herbs, Summoning, and Prophecy (all pseudonyms). Data collection occurred during the last phase of the Herbs and Summoning DAT work as external facilitation began to diminish, and immediately after the Prophecy DAT concluded their work. Thus, we deemed them as well-positioned to pilot the DAT Core Principles IC Map, which has gone through subsequent revisions. The current version can be found in *Facilitating change in higher education: The Departmental Action Team mode* (Ngai et al., 2020). Twenty-nine DAT members were invited to

² All principles and their corresponding variations can be found in this document: <https://tinyurl.com/3zaphsbm>.

participate, and 19 responses were received. Respondents included department members as well as facilitators, many of whom were involved in the development of the IC Maps.

We used a Google form to administer the IC Map as a survey and synthesized perspectives from DAT members to establish a holistic picture of the level to which the DAT was embodying each of the six principles. First, DAT members were asked open-response questions about their DAT's goals and the DAT experience, and then multiple-choice questions about the six principles followed where respondents were prompted to choose variations of each principle that matched their DAT's implementation. Following each multiple-choice prompt, respondents were also asked if they had additional comments, which were provided as open responses. The survey ended with two closed-form responses about department structures, however, the focus of this manuscript is on how the DAT engaged with the six core principles.

Participants' responses were categorized (aligned, partially aligned, unaligned) by the authors based on the variation selected for each core principle. Responses from facilitators triangulate and add context to broader results.

Results

In the following sections we describe three DATs (Herbs, Summoning, and Prophecy) and how they focused their work based on their survey responses. We discuss members' perspectives of how their respective DAT's work aligned with the six principles.

Herbs

The Herbs DAT assembled for about two academic years with the primary aim to assess the alignment between the department's desired student outcomes and the skill development from targeted coursework for undergraduate majors. At any given time, the Herbs DAT was composed of up to seven members: up to four faculty members, one graduate student, one undergraduate student, and up to two facilitators, with members cycling on or off the DAT due to other obligations. Seven Herbs DAT members responded to the IC map survey: one student, three faculty members, and three facilitators.

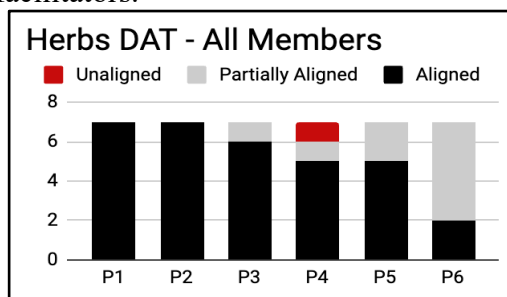


Figure 2. Herbs DAT responses to IC map.

The Herbs DAT members were in complete agreement with regard to alignment with P1 and P2 (Figure 2). Although in agreement on P2, there was some tension, with a facilitator noting that there were times when a couple of DAT members had “outsized influence” on the work. For the most part members were also in agreement with regard to their use of data (P3). The one dissenting respondent, a facilitator, commented that “data comes from their choice of assessments. [It is] unclear whether they will engage in pure bias prediction activity. [Institutional Research] and course data has not been included.”

While five of the seven respondents characterized Herbs' collaboration (P4) as ideal, a few members noticed certain areas that did not align with the DAT model. One member indicated

that they perceived the group collaboration to be overall positive, but questioned whether the DAT would actualize their goals. One facilitator chose an unaligned option, noting that there were some members with “lower attendance.” However, another facilitator highlighted the DAT’s success in fostering collaborative learning about assessment.

For P5, two members selected a partially aligned statement expressing concern with specific details of how and when assessments would be conducted and how results would impact future work. Two faculty expressed uncertainty about lasting impact, with one indicating it would be dependent on whether faculty continue the work, and another noting the need for establishment of an ongoing committee if the work was to continue.

Regarding P6, the DAT respondents were mostly in agreement that their work was partially aligned with a commitment to equity, inclusion, and social justice, with two members feeling that the work was aligned. For example, one facilitator acknowledged the diversity in the membership of the Herbs DAT but expressed some reservation about the degree to which Herbs’ work was grounded in equity, inclusion, and social justice. They explained, “I wouldn’t say inclusion is routinely considered, but they have done so unprompted.”

Summoning

The Summoning DAT operated as a DAT for about two years, honing on the issue of cultivating community among the undergraduate majors. Summoning began their work with six members: three faculty members, two graduate students, and one facilitator. The membership expanded to include up to two undergraduate students and two external facilitators. Six of the ten Summoning members completed the IC map survey, including three facilitators, one faculty member, and two students.

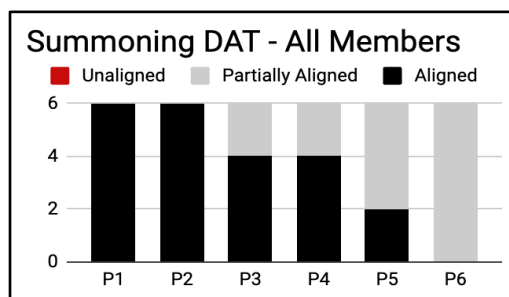


Figure 3. *Summoning DAT responses to IC map.*

The Summoning DAT was in agreement with perceived alignment with P1 (Figure 3). Summoning members saw the value that students brought, noting that they were “driving forces” for change and “accomplishments would not have come to fruition without them.” One student member expressed that they were able to develop communication skills and a sense of belonging:

I have been able to work with my professors in the DAT and meet with some amazing people, learn how to communicate effectively and hear so many different ideas. I really was able to learn the beauty of collaboration from a socially diverse group.

One facilitator responded, “this is the DAT that showed me how friendly and supportive a group can be toward its undergraduates.”

The DAT members also were in agreement about alignment with P2. While the DAT felt that their work was primarily consensus-driven, some members felt that there were some instances when work was driven by a few more vocal members - thus categorized as aligned, but not ideal.

Disagreement among members crops up more with regard to P3 and P4, with four members perceiving their work as aligned with the DAT model and two members selecting partial

alignment. Members who felt that they were aligned with P3 noted that they used student survey data, department statistics, and faculty and student opinion polls, noting specifically that their work was “motivated by student voices”. The two respondents who perceived the work as partially aligned, one of whom was a facilitator, did not elaborate on their selection. There was however further elaboration with regard to the partial alignment characterization of P4. Two DAT facilitators chose partial alignment here, with one adding “they have been stronger as a group around their process skills, than in executing projects that will be big/structural/sustainable.” While the group collaborated well, it struggled to achieve its goals.

Four respondents' selections were coded as partially aligned with P5; these respondents acknowledged that change may occur, but two of them did not believe that Summoning considered nor developed an assessment to guide the change, and the other two did not believe the group planned for sustainability.

The IC map prompt for P6 asked respondents to measure the extent to which their work is grounded in equity, inclusion, and social justice with choices pertaining to both 1) the group composition and 2) the DAT’s work. All six respondents indicated the DAT partially aligned with the ideal of P6. One facilitator stated,

[The group was diverse] in role and gender. They have considered how language and scheduling impact [undergraduates] vs. other roles in the department. They have considered issues of [universal design for learning] and accessibility, but they didn't apply these strongly to event planning. They struggled over how to advertise inclusively for various reasons. One member requested inclusion be put in the agenda, once.

One member stated, “We lack diversity in our membership, but I think it is something that we realize and we are trying to think about it with respect to our goals.” So, while there was agreement regarding group composition, there was some tension around whether or not DAT work was grounded in P6.

Prophecy

The Prophecy DAT was made up of four faculty members, one graduate student, and two external facilitators. Membership remained unchanged for the Prophecy DAT during its one-year tenure. Of the seven DAT members, three faculty members, one graduate student, and two facilitators responded to the IC map survey. Responses on the IC map survey indicated that the Prophecy DAT struggled in identifying a singular goal for their work.

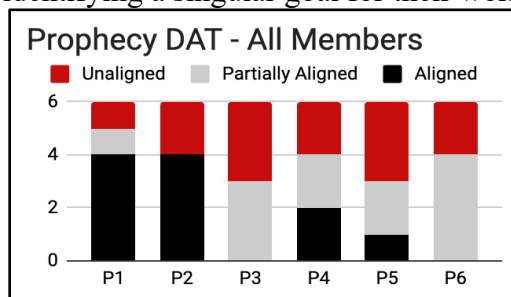


Figure 4. Prophecy DAT responses to IC map.

Figure 4 illustrates the mixed perceptions Prophecy DAT members had with regard to the six principles. Although P1 and P2 had some agreement of perceived alignment, there were still notable differences. For instance, the graduate student member stated finding it “difficult to contribute [her] opinion.” Other DAT members felt that their student member was valued and

had meaningful participation opportunities. Further, both facilitators and the graduate student stated that having an undergraduate student on the DAT would have been valuable.

The divide with P2 was between department DAT members and facilitators. The facilitators did not see the work as having a meaningful positive outcome. In contrast, the department DAT members selected statements coded as aligned with P2. These selections seem to contradict these members' statements that they had difficulty identifying a goal.

None of the Prophecy DAT members selected choices coded as aligned with P3. A facilitator pointed out that data was examined early on when the DAT was looking into doing work associated with Prophecy majors and research experiences. However, the facilitator also stated in their response that when they brought up the need to examine data connected to Prophecy's final goal, some DAT members pushed back, telling the facilitator "this is not an education research project." This indicates that in addition to not coalescing around a distinct goal, these DAT members did not recognize data's role in decision-making and their change efforts more broadly.

P4 and P5 had the least agreement among DAT members, with members' responses ranging from aligned to unaligned. While some found the meetings generally enjoyable, some were frustrated with the presence of facilitators, with one member stating that they felt like the facilitators were trying to "move in a direction" that was different from what the department DAT members wanted. There was a lack of agreement regarding sustainability (P5), most members viewed the work as a temporary "fix". One department DAT member noted that faculty are already overburdened with service, so the DAT work was not a priority and "a permanent DAT would be unwelcome both for the DAT members and for other department members."

The department DAT members were in agreement regarding P6, with all members selecting the partial alignment option, "The group exhibits diversity within its membership. The group can consider how decisions impact diverse populations when prompted." One pointed out that diversity was a challenge as members of the Prophecy Department were predominantly White and male. However, another DAT member felt that their group "could have been more diverse". The student member noted the lack of diversity, being the only student and female member, apart from facilitators. One department DAT member felt that the DAT did "indeed frequently consider the effects of [their] work on the diversity of our major population". However, a facilitator DAT member, in contrast, selected the unaligned option and added a note in their open response that they did not see any commitment by the DAT to equity, inclusion, or social justice.

Discussion

Responses to the IC Map survey yielded varied perceptions of alignment with the Core Principles of the DAT model. However, across all three DATs, P6 was the principle where most respondents did not perceive alignment with the DAT model. Historically, oppression and power imbalance have been prevalent in academic structures and across roles. Deep change work must attend to academic systems, structures, and roles (e.g., Fisher & Henderson, 2018; Henderson et al., 2011; Kellam et al., 2020; Malachowski et al., 2020; Reinholz & Apkarian, 2018), with consideration given to understanding how change impacts marginalized groups. A DAT could attend to this in several ways, including recruiting diverse (e.g., in role, background, gender, race, etc.) members when establishing a DAT, soliciting input and feedback from a diversity of stakeholders, and critically attending to issues of equity, inclusion, and social justice as it pertains to the DAT's overall goals. While Herbs and Summoning exhibited diversity in their membership, external facilitators noted the lack of a grounding or execution of DAT work attending to equity, inclusion, and social justice. Department DAT members of Prophecy, on the

other hand, acknowledged a lack of diversity in their membership. Further a facilitator questioned Prophecy's commitment to these principles in their DAT work altogether.

DAT Goals correlated with the enactment of six principles

We noticed a relationship between clearly articulated goals agreed upon by all members and better alignment with the principles. Summoning and Herbs were exemplars of how clear goals were associated with (perceived) alignment with the six principles. In contrast, Prophecy struggled to identify and state a goal and achieve alignment with the principles. This association may occur when a clearly articulated goal facilitates a DAT's embodiment of the six principles. For instance, a goal can guide a DAT's approach to stakeholder input, data collection, and feedback, which are necessary for informing their work.

Herbs. The work of the Herbs DAT focused on student outcomes and skill development in targeted coursework. They believed that including a student voice (P1) was crucial to achieving their student-centered goal. In addition, Herbs' clearly articulated goal may have better positioned them to focus on achieving positive outcomes as a collective (P2). Short-term success was perceived, but the long process to actualizing the stated goals raised concerns about the DAT's productivity (P4) and sustainability of efforts (P5). Ultimately, members acknowledged that institutionalization was necessary for long-term sustainability. Overall, the Herbs DAT mostly agreed on alignment (or in some cases partially aligned) with the six principles and considered themselves successful in pursuing their goal.

Summoning. Summoning aimed to foster community among undergraduate students in their program. To incorporate the student voice, which was crucial in discussing student community aspects, Summoning recruited and actively engaged student members in their DAT work (P1). Both department DAT members and facilitators emphasized the value of the student voice, and targeted data sources that would help them capture it (P3). Although Summoning focused on collectively achieving positive outcomes (P2) and collaborated in a rewarding way (P4), they struggled to have a clear assessment plan to guide ongoing work and change efforts (P5) focused on the undergraduate student community in their program.

Prophecy. Unlike Herbs and Summoning, Prophecy struggled to define a clear goal and also struggled with uncertainty about which student voices should be heard and debates over student inclusion (P1). The absence of a focus hindered discussions on data-driven decision-making (P3). Furthermore, some department members felt that facilitators were steering the work in a direction not chosen by the DAT members, causing collaboration difficulties (P4). Overall, this lack of clarity made it hard for the Prophecy DAT to focus their meetings and work in a meaningful way, which negatively impacted long-term efforts and sustainability (thus Prophecy's lack of alignment with P5). It is possible that for the Prophecy DAT the absence of a clear goal contributed to varying perceptions of alignment with the six principles.

Conclusion

The DAT model provides a framework for anyone wishing to pursue department-level change with the IC Map acting as a research-based tool for professional development facilitators or teams engaged in change work. The six core principles of the DAT model can guide teams to actualize sustainable and meaningful change within their communities. DAT facilitators and team members can use the IC Map to regularly evaluate the alignment of their work with the six core principles and make adjustments as needed. However, the analysis of the three DATs underscores the need for clearly articulated goals towards pursuing sustainable departmental change.

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