

Introducing the Departmental Action Leadership Institute and its preliminary outcomes

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The Departmental Action Leadership Institute (DALI), a component of the Effective Practices for Physics Programs (EP3) Initiative, works with physics departments to help them implement improvements to their undergraduate programs. Each participating department designates two faculty members as *change leaders*. These change leaders participate in DALI activities for one year, through which they learn about, reflect on, and implement effective change practices. During DALI, the change leaders facilitate local teams based on the Department Action Team (DAT) model. We introduce the DALI model, including some of the principles that went into its design. We then present some of the results from a summative assessment of the first DALI cohort. We focus on the growth of change agents' feeling of preparedness to enact components of effective departmental change and on their increased feelings of motivation and ability to create change.

I. INTRODUCTION

Physics departments face numerous challenges in meeting their dual mission of teaching students and supporting physics research. Many departments struggle to graduate enough majors to satisfy budget-conscious administrations [1–3], and physics is among the least diverse of all academic disciplines [4]. While the faculty in these departments are trained to conduct research and (to a lesser extent) to teach, they rarely have any training in leadership, administration, building programs, or creating change. What experience faculty do have in these areas is generally acquired “on the job” as they try to meet structural challenges while being rewarded almost exclusively for teaching and research.

Recognizing the gaps between training and need, the physics and STEM communities have responded with a range of initiatives to support departments and faculty, most notably in improving equity, diversity, and inclusion (e.g., APS IDEA [5], AAAS Sea Change [6]) and supporting curricular and instructional change (e.g., PICUP [7], Living Physics Portal [8], NGPET FOLC [9], AMTA [10]). Efforts to support physics faculty more broadly as leaders and agents of change have been largely limited to workshops such as the New Faculty Workshop [11] and the Physics Department Chairs Conference [12] and to loose cross-disciplinary networks such as ASCN [13] and Project Kaleidoscope [14].

To fill this gap, the Departmental Action Leadership Institute (DALI) [15] is a distinctive, intensive approach to supporting significant change efforts in physics departments by providing change leaders within departments with the knowledge and skills necessary to successfully shepherd those initiatives, along with a supportive community of colleagues. DALIs cultivate the capacity of departments to engage in the deep self-reflection necessary to initiate sustainable “second-order” change, which requires the department to fundamentally change how it operates [16]. The coaching provided within DALI supports physics faculty in surfacing and revising their implicit theories of how change happens [17].

II. OVERVIEW OF THE DALI MODEL

The Effective Practices for Physics Programs (EP3) Initiative is a joint effort of the American Physical Society (APS) and the American Association of Physics Teachers (AAPT), with the goal of “support[ing] physics programs with collections of knowledge, experience, and proven good practice for responding to challenges and engaging in systematic improvement.” Its main component is the EP3 Guide [18], a comprehensive, structured resource that contains information on all aspects of running an effective physics program.

DALI is one mechanism by which the EP3 Initiative is helping physics departments improve their undergraduate programs. DALIs support their member departments in engaging in a change process that will lead to a stronger culture of self-reflection, action, and sustainable improvement.

DALI membership has been open to departments that award physics or astronomy degrees from four-year institutions in the United States. Interested departments submit an application, which includes a narrative describing the departmental context, history with change efforts, challenges and opportunities, and participation rationale, as well as letters of support from the department chair and dean. Accepted departments designate two members as “change leaders” to directly participate in DALI. Each DALI cohort has included five physics departments from a variety of institution types.

The change leaders are the departments’ representatives in DALI; they participate in all DALI activities and are responsible for leading the change effort in their departments. These change efforts are based on the Departmental Action Team (DAT) model, which has been written about extensively elsewhere [19–24]. Each department forms a DAT that is facilitated by the change leaders and that consists of faculty members, staff, students, and other stakeholders relevant to the undergraduate physics program (e.g., alums, advisors). The DATs work includes visioning, designing, implementing, and assessing the change effort; it is the change leaders’ responsibility to translate the ideas about change that they are learning in DALI into practice in their DATs. This “translation” is necessary because each DAT is embedded in a particular physics program, department, and institutional context, which will all impact how the DAT carries out its work.

DALI is led by two facilitators who are responsible for the logistical and intellectual work required to implement DALI, which includes selecting applicants, developing DALI meeting content, managing meeting logistics (e.g., scheduling, creating agendas, setting homework), and advising change leaders outside of regular meetings. Ideally, DALI facilitators should have expertise in higher education organizational change theory as well as experience in having led change efforts themselves (e.g., as a department chair). The first two cohorts were facilitated by authors Corbo and Craig; they will facilitate cohorts 3 and 4 along with new facilitators.

DALI takes place over a calendar year, beginning with a kick-off workshop that serves as a “crash course” into DALI philosophy and process, giving the change leaders an overview of the ground that DALI will cover and more clarity into their roles as change leaders within the DAT model. The workshop also allows the change leaders to get to know each other and their departments, which will help them to better support each other as DALI progresses. The first two DALI cohorts had virtual kick-offs that consisted of four 3.5-hour sessions over several weeks. The third and fourth cohorts will launch in September 2022 with a 2.5 day in-person workshop.

After the kick-off workshop, DALI meets virtually approximately every two weeks for 1.5 hours. Each meeting starts with a brief get-to-know-you activity. Then, one of the five change leader pairs discusses the state of their change effort so that the group can help brainstorm solutions to challenges and share their own experiences. The rest of the meeting is devoted to a topic related to leading effective change; this could involve discussing a reading assigned by the facilitators

or the facilitators guiding the change leaders through an activity (e.g., developing SMART goals) that they could then do with their DATs. These topics are organized into four *strands*: carrying out the change effort, developing a high functioning team, building positive relationships outside the DAT, and growing as change agents. These strands are based upon the DAT model theory of change [25] and principles [21].

In parallel to synchronous meetings, the change leaders and DALI facilitators communicate asynchronously via Slack, sharing resources and answering each other's questions. DALI facilitators also have periodic "2-on-2" meetings with the change leader pairs to allow for deeper, more focused conversations than are possible at regular DALI meetings. Finally, DALI ends with a virtual, 3-hour wrap-up event where change leaders reflect on their DALI experience, articulate their accomplishments, and commit to a plan for how they will continue their work moving forward.

DALIs are an intense, time-consuming experience for both DALI facilitators and change leaders. However, we argue that this level of intensity is necessary to achieve our desired outcomes for both the change leaders and their departments. After DALI, the change leaders should be able to successfully engage in all component activities of the four strands as they effectively lead their local DAT and strengthen the capacity of the DAT to create and sustain change. Through this process, the department should develop the capacity to create and sustain changes to itself and its programs; develop a culture of continuous self-reflection, assessment, and improvement; and make meaningful progress toward addressing the challenges that led them to join DALI in the first place.

None of these outcomes can be fully achieved in the timescale of DALI; a year isn't enough time to engage in a complex change effort from start to finish or to achieve mastery of all of the relevant skills, particularly when change efforts are constrained by the academic calendar and service work is seen as an "add-on." Instead, DALI's role is to set the change leaders and their departments up for future success. This orientation informs the design of DALI.

Modeling: DALI facilitators model behaviors that they want the change leaders to engage in, from the format of meeting agendas to the facilitation techniques they use to encourage participation. In this way, the change leaders are not just learning about abstract concepts, but are experiencing effective facilitation techniques and activities first hand.

Critical reflection: Change leaders are regularly asked to reflect on what they are learning in DALI, especially how particular readings or activities might apply to their local contexts. DALI facilitators also take the time to explicitly unpack the rationale behind these activities. This is an essential piece of the "translation" work that the change leaders must do to implement what they have learned into their DATs.

Ongoing support: The extended nature of DALI allows for ongoing support of the change leaders as they launch the change efforts in their departments. This external accountability can help them persevere through challenges and avoid being permanently derailed by the countless other demands

on their time and attention.

Broad stakeholder involvement: DATs are expected to include members from across the department, including faculty, students, and staff. For departments that participated in DALI, these DATs are the first structure to include representation from all of the stakeholders impacted by the undergraduate program on equal footing. Inclusion of these voices makes it more likely that a change effort will be successful [16, 26].

"Go slow to go fast": A common failure mode of change efforts is satisfying a desire to "do something" by jumping straight to action [16, 27–29], an approach that doesn't work for complex second order change. Instead, DALI facilitators encourage the change leaders to start out "going slow"—developing a functional team culture, creating a collective vision, collecting and analyzing data, and cultivating allies. This foundation will allow them to "go fast" later—to efficiently implement, assess, and iterate on their change plans.

Data-driven decisions: There are generally many things a department might do to address a challenge, but it rarely has the time, resources, or personnel to try them all. Instead, decisions should be made with sufficient data to ensure that the department undertakes initiatives that are likely to solve the problems it *actually has*, rather than ones it guesses it *might* have. This principle informs much of DALI curriculum.

Together, these design choices encourage the change leader pairs to enact a culture in their DATs that is often different from their departmental cultures in key ways (e.g, orienting to students as partners). Thus, the change leaders are not only apprenticing into particular change strategies and facilitation practices, but they are also building a new vision and set of values that can go on to influence their department more broadly as they take them into new departmental contexts.

III. METHODS

An exit survey for the first DALI cohort was designed to provide summative feedback for improving future DALIs. The survey is composed of 5 sections: (i) comparing pre-DALI preparedness to post-DALI preparedness in enacting components of effective change aligned with the four strands, (ii) evaluating the degree of support within DALI for apprenticing into each component, (iii) reporting on the level of success in taking up each component within their local DATs, (iv) assessing the alignment of their current and ideal DAT implementation, and (v) describing their holistic growth as change leaders. Here, we highlight outcomes for DALI change leaders informed by analysis of sections (i) and (v) for the eight change leaders (out of ten) who consented to participate in research.

IV. PRELIMINARY DALI OUTCOMES

In survey section (i), change leaders reported their level of preparedness in enacting components of effective change on a

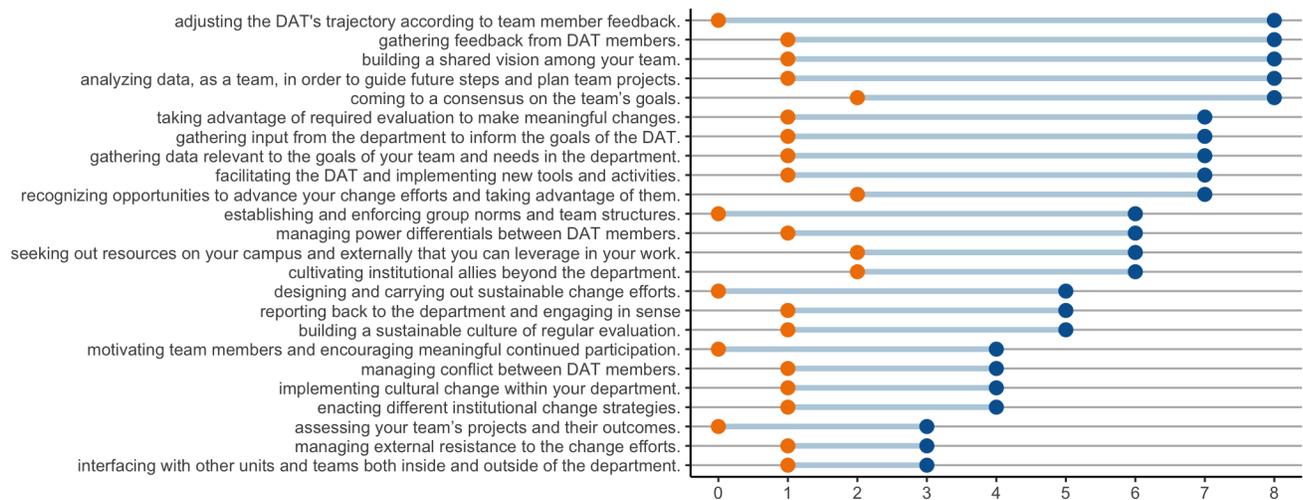


FIG. 1. The number of DALI participants who reported being largely or completely prepared prior to DALI (orange) versus after DALI (blue) on specific components of change leadership aligned with the four DALI strands.

5-point Likert-scale (not at all, scarcely, moderately, largely, or completely) both prior to and after their participation in DALI. All eight change leaders left DALI feeling at least moderately prepared to engage in all but two of the components (only seven felt moderately prepared for *enacting different institutional change strategies* and *building a sustainable culture of regular evaluation*). Pre-DALI, only between one and six change leaders reported feeling moderately prepared, depending on the component. Thus, there was a large shift in the change leaders' confidence in guiding effective change in their department and facilitating teams to do so.

In Fig. 1, we plot the number of change leaders that felt either largely or completely prepared in each component of change both pre- and post-DALI. This allows us to see variation in the change leaders' post-DALI preparation that is hidden when we include "moderately prepared." All eight change leaders felt largely or completely prepared to engage in five components of change: *building a shared vision among the team*; *coming to a consensus on team goals*; *analyzing data, as a team, in order to guide future steps and plan team projects*; *gathering feedback from DAT members*; and *adjusting the DAT's trajectory according to team member feedback*. In contrast, only three change leaders felt largely or completely prepared to enact three components of change: *assessing teams' projects and outcomes*, *interfacing with other units and teams inside and outside the department*, and *managing external resistance to change efforts*. The other components fell somewhere in between.

By the end of DALI, change leaders had been working with their DATs for 8 to 10 months. During that time, there were certain components of leading change that they would have been more likely to have implemented or experienced with their DATs, either because they come early in a change pro-

cess or because they were emphasized by the DALI facilitators. However, some components come late in a change process or were not directly addressed by the facilitators because they happened to not arise in these DATs. This distinction largely explains the pattern in the data: change leaders feel more confident in components of change that they had more time to experience and that were more emphasized by the facilitators. Additionally, when asked about the progress of their DAT (data not presented here due to space), change leaders report having not yet attempted the components that they also felt least prepared to exact. This supports the idea that DALI was successful in apprenticing them into their roles as change leaders. Nevertheless, all of the components of change are important in carrying out a successful change effort, so it is important for the facilitators to consider how to build those capacities within change leaders in future cohorts.

Survey section (v) included several open-ended questions. We draw from responses to three: what have you appreciated the most about your DALI experience; how has your participation in DALI shaped your professional work; and thinking about everything you have experienced in DALI, what are you most proud of accomplishing/overcoming professionally this past year. We observe two main themes: (1) change leaders taking more measured and intentional approaches to change work and (2) change leaders feeling more agency and a renewed hopefulness toward their ongoing work.

Many change leaders' responses indicate that they value the intentional, go-slow-to-go-fast approach to change advocated by DALI, including learning to work as a team, taking time to develop a shared vision, collecting data, and so on. These responses speak to DALI strands of *carrying out the change effort* and *developing a high functioning team*. For example, Harold states:

[I have appreciated] learning how to form the DAT and set up norms such that a group of faculty, administrators, alum, and student[s] can collectively work towards an agreed upon goal, and the [focus] on collecting data to support the desired and intended change.

Here, Harold describes his appreciation of DALI in guiding him through the DAT formation process, which he sees as enabling his team to be data-driven and work collaboratively. Similarly, Charles states:

I am most proud of the work my department's DAT has accomplished this past year. We were able to develop a vision, run a focus group with our undergraduate physics majors, and developed a survey for the students in our calculus-based physics. This year, we hope to use the information from the focus group and survey to improve retention and recruitment.

Charles describes his DAT's accomplishments, and while they are not tangible changes to his undergraduate program, he is still proud of this work and sees how it will lead to meaningful change to retention and recruitment. In both cases, the change leaders demonstrate that they value the DALIs measured intentionality and believe that this approach will help them reach their desired outcomes.

Additionally, we see substantial growth in change leaders' motivation and belief in their own ability to create change. For example, Misha states:

I always came out of DALI meetings feeling empowered and motivated. Everybody was committed to their goals and ready to put in the effort . . . For the first time I am truly believing that my physics program is salvageable. I am motivated to bring my department back into a thriving state. I feel equipped and trained to lead this change.

The ongoing DALI meetings and the commitment of her fellow change leaders helped Misha to build and maintain motivation and to feel that she has the ability to meaningfully improve her department. This is a significant change, given that before DALI, she didn't believe that her program was "salvageable." Such feelings of motivation and competence encourage the change leaders to continue their work, support their DATs, and push their change efforts forward.

DALI focuses on apprenticing change leaders into a particular approach to creating change and into applying this approach to their own context. Change leaders cite their appreciation of this process and note that it has prepared them to address their challenges. For example, Henry states:

By far, what I am most proud of is coming away from DALI feeling like I can lead a change effort in my department not by solving the problem but by facilitating a change effort involving a diverse group of stakeholders. Such change will be much more robust and lasting.

Henry's quote indicates that he has embraced the DALI model and can see his own role in it not as a problem solver but as a facilitator marshaling the strengths of a diverse team. Moreover, he recognizes that change driven by a collective will be more sustainable than change driven by himself alone.

Through these quotes, we see change leaders describing a renewed sense of agency in addressing department problems, a sense of being equipped with new change leadership skills, and a renewed hopefulness motivating their ongoing work—all derived from their DALI experience. They see their DAT's work as a foundation underlying their continued change efforts. While these outcomes do not indicate what might be changing in the culture of the department, they do provide evidence that the change leaders themselves are growing into the model provided by DALI. This is an important step towards increasing the department's capacity for implementing sustainable change in the future.

V. CONCLUSIONS

DALI has improved change leaders' preparedness in enacting many components of effective change—in fact, all the change leaders report feeling least moderately prepared to enact all but two of the components of change included in the survey. Nevertheless, change leaders feel less prepared to enact components related to activities later in the change process, especially those they have not yet had the chance to attempt by the end of DALI. Thus, while DALI is successful in attuning to the immediate needs of change leaders and their DATs, it remains to be seen how well prepared change leaders are for later parts of the change process. As the DALI facilitators revise and streamline the DALI curriculum for subsequent cohorts, they will work to integrate more of these "later parts" into the DALI experience, either through the existing structure of biweekly meetings or through other mechanisms (e.g., check-ins with the departments six months to a year after their cohort ends).

Change leaders' own descriptions of their growth through DALI reveal two main themes: (1) they take up a more measured, go-slow-to-go-fast approach to change that includes broad stakeholder involvement and (2) they develop confidence in their ability to lead change, which enables increased motivation. The change leaders attribute these outcomes directly to DALI. Future work will investigate what DALI structures contribute to these outcomes and how these outcomes play out in the DATs and departments in the long term.

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