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Transforming Undergraduate Education

From the Middle Out

With Departmental Action Teams

By Daniel L. Reinholz , Mary E. Pilgrim,
Joel C. Corbo, and Noah Finkelstein

Universities are facing increased pressure to support educational change. But how can leaders promote change in a sustainable, scalable manner? Historically, many efforts have relied on either *top-down* policy shifts or *bottom-up* grassroots efforts in isolation (Henderson, Beach, & Finkelstein, 2011). Instead, we focus on a “middle-level” approach that centers on the department as a locus of change (Reinholz, Corbo, Dancy, Deetz, & Finkelstein, 2015) through the creation of Departmental Actions Teams (DATs).

To date, educational change efforts that involve “dissemination” or “scale-up” approaches have had only a modest impact, especially when they fail to account for institutional context (Austin, 2011; Fairweather, 2008; Kezar, 2011). Additionally, many change efforts fail when they ignore culture—the underlying beliefs, assumptions, values, and ways

of interacting that characterize an organization (Schein, 2010).

A more effective approach to change is one that views the university as a complex system (Kezar, 2014) and that engages multiple levels of this system at once (Corbo, Reinholz, Dancy, Deetz, & Finkelstein, 2016). Given that policies, structures, and disciplinary norms are relatively consistent across a single department (i.e., a department has its own culture), departmental-level changes are more likely to be sustained when they are aligned explicitly to that culture (Reinholz & Apkarian, 2018).

For these reasons, the DAT model focuses on creating sustainable change through ongoing, albeit temporary, engagement with a department that takes its context and culture into account. In DATs, we engage faculty members, students, and staff to make broad-scale educational shifts within a single

department (Reinholz, Corbo, Dancy, & Finkelstein, 2017). External facilitators guide DATs through a change process that supports particular outcomes within the department. By engaging with the DAT process, individuals become empowered as change agents to continue to improve their departments even after the DAT's work concludes. This allows for a DAT—a temporary group—to impact a department in a sustained manner.

Here, we describe the history of the DAT model, provide an overview of how it works, describe its impacts, and provide two illustrative examples that show how campus leaders can learn from and use the DAT model to improve education at their institutions.

HISTORY AND INSTITUTIONALIZATION

The DAT model was developed with funding from the Association of American Universities and National Science Foundation. DATs were initially developed at the University of Colorado Boulder (CU) in 2014. Since then, the model has been applied to over a dozen science, technology, engineering, and math (STEM) and non-STEM departments across two universities, with over a dozen others expressing interest.

The programmatic work of the DAT project at CU is currently housed within the Center for STEM Learning and the Office of Information Technology (OIT), both of which support teaching and learning on the campus. These centers support DAT facilitators—both grant-funded postdoctoral researchers and OIT staff members—to support departments

In Short

- Many change initiatives result in quick fixes that do not result in lasting, sustainable improvements.
- The Departmental Action Team (DAT) model organizes faculty, students, and staff in a department to work together to address cross-cutting issues related to undergraduate education.
- DATs build sustainable structures in their department; at the same time, external facilitators attend to the DAT process, which helps DAT members develop skills and knowledge related to change.
- DATs are most effective when they are in regular communication with department leadership but have agency to pursue their own goals aligned with the department's broader goals.



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at CU. To date, CU has made some partial commitments that have the potential to continue facilitation after the end of grant funding.

Additionally, DATs have been adopted by CU's Teaching Quality Framework (TQF) initiative, which is working with more than a dozen departments to support more scholarly and developmental forms of teaching evaluation (Reinholz, Corbo, Bernstein, & Finkelstein, 2019). Work at CU has benefited from the prior presence of the Science Education Initiative (SEI), which focused on course transformation through backwards design (Wieman, 2017). While both the SEI and DATs support departments through embedded expertise, SEI facilitators typically worked with a single department, whereas DAT facilitators, as described below, work with many departments simultaneously while focusing on much broader education goals.

Colorado State University (CSU) Fort Collins is the second site to be added to the DAT project. Similar to CU, DAT facilitators at CSU are housed in The Institute for Learning and Teaching, which has integrated DATs with other educational development work on the campus. DATs have been adopted by campus-level administrators as a mechanism to advance the Student Success Initiative 2 (SSI2), a campus-wide effort to improve retention and graduation rates, with a particular focus on sophomores and juniors. Involvement with SSI2 expanded the original STEM focus of DATs at CSU to include several non-STEM departments, and the effectiveness of SSI DATs is currently being evaluated. As these cases illustrate, the DAT model can fit well within existing educational development structures, like a campus

Teaching and Learning center, and can support other campus initiatives.

THE DEPARTMENTAL ACTION TEAM MODEL

A DAT is a group of (roughly) four to eight faculty members, students, and staff within a single department. Meaningful departmental support, especially from the chair, is prerequisite to forming a DAT, because it increases the likelihood of a department taking up the DAT's work. A DAT meets regularly for up to four semesters, typically for an hour every other week. Its overarching goal is to create sustainable change around a broad-scale issue related to undergraduate education in the department (e.g., curricular alignment, equity in the major, community building).

The DAT's focal issue is not externally defined. Instead, the DAT begins with a series of activities to develop a shared vision, consensus on the focal issue, and a set of goals. This helps DAT participants to be more committed to the DAT's work. Once a focus has been selected, the DAT works collaboratively to meet its goals by collecting, analyzing, and interpreting relevant data to better understand the focal issue; creates and implements a plan of action; assesses its progress; and communicates with its department and relevant external stakeholders to maintain support, gather resources, and demonstrate success.

At the end of its work, the DAT will ideally have created new departmental structures and processes for sustaining improvements (e.g., departmental roles, committees, policies, assessments) related to its focal issue. As such, a DAT's success is demonstrated by its ability to build infrastructure and resources for addressing educational needs identified in a department. These structures and resources in turn are then used to directly impact educational practices and student outcomes.

EXTERNAL FACILITATION AND A FOCUS ON PROCESS

DATs facilitators lead a DAT by using their expertise in education, institutional change, group processes, and campus resources. These facilitators are responsible for managing logistics for the DAT participants, supporting their development as a highly functional working team, providing support that is customized to their goals and needs, and increasing their capacity as change agents. As departmental outsiders, the facilitators bring in new ways of thinking and custom-tailor their approach to fit with each department's local culture and context. DAT facilitators may be funded by an external grant or they could have permanent positions within a Center for Teaching and Learning or equivalent unit on campus.

The facilitators directly support the work of the DAT by structuring meetings to help the group move through a series of steps: visioning; goal setting and landscape assessment; action planning and implementation; and assessment. As this work progresses, facilitators deploy specific techniques to help the group make complex decisions, come to consensus, brainstorm ideas, and have productive discussions. Through

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all this, facilitators explicitly teach and implicitly model skills related to collaboration and institutional change.

This focus on process is central to a DAT's success in creating lasting changes. By engaging in a functional, collaborative process, participants become more empowered agents of change, both with respect to the DAT's focal issue and any future change they try to make. Thus, the department benefits from the DAT process in addition to the new structures that the DAT creates.

CORE PRINCIPLES

To build such infrastructure, facilitators and DATs follow six core principles (Quan et al., 2019):

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

These principles act both as features that define the “ideal” departmental culture that the DAT project is striving to create and as touchstones to guide the evolution of the DAT model. They represent both best practices from the organizational change literature *and* the values of the DAT project team. These principles are shared with DAT participants, and the project teams use them to formatively assess shifts in a department's culture.

THE IMPACTS OF DATS

The impacts of DATs have been documented in a wide variety of departments (Reinholz et al., 2018). These impacts include new standing committees, instructor positions supported by course releases, curricular assessment tools, and community events, all of which can continue long after a DAT is disbanded. In addition, DAT members report their own development as change agents (Reinholz, Ngai, Quan, Pilgrim, Corbo, & Finkelstein, 2019). Because every DAT has a unique goal, it is difficult to describe the impact of DATs in the aggregate, but rather, it is up to each DAT to collect data to demonstrate its impact on an ongoing basis.

The first two DATs at CU, from the Runes department and the Potions department (pseudonyms used to protect the identities of participants), provide examples of success in addressing two persistent challenges in higher education: curricular alignment and improving equity.

Curricular Alignment

Many departments at CU have a long history of educational reform. For example, the Runes department (Reinholz et al., 2019) was widely considered an SEI success story, implementing active learning strategies and extensive

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learning goals in their major course sequence. Still, department members noted backsliding in progress within a few years of external support ending.

This drove the creation of a Runes DAT, which analyzed curricular alignment and student course-taking patterns, and made the case to the department that there was a need for three new positions to support the sustainability of the successful changes the department had already made. Each position was supported by a course release for a non-tenure-track instructor (all three of whom were members of the DAT). The positions have continued to exist after two department chair changes, so it seems highly likely that they will continue to exist for a long time. Thus, the DAT supported the creation of a new structure that can support curricular innovation indefinitely, even without continued external funding.

These positions have supported curricular alignment, built new structures (e.g., a course for undergraduate teaching assistants, faculty coffee hour), and provided discipline-specific professional development to other faculty members through workshops and individual consultations. Before engaging in these activities, a survey was administered to department faculty to understand their current teaching practices. By later administering a follow-up survey and analyzing institutional data on student course-taking patterns and student outcomes, the department will be able to track the impact of this work over time.

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Equity

Equity in the undergraduate major is another important issue that many departments face. The Potions department (Corbo, Reinholz, Dancy, & Finkelstein, 2015; Rainey, Corbo, Reinholz, & Betterton, 2016) created a DAT to improve the recruitment and retention of women and underrepresented minority (URM) students as undergraduate majors. The DAT analyzed a variety of data on student admissions, persistence, and outcomes, which it reported back to the department and used to convince the faculty to convert the DAT into a standing committee focused on equity and inclusion.

The DAT, the subsequent standing committee, and a spin-off group have been responsible for a number of changes in the department: proactive recruitment of underrepresented students admitted to CU, fall welcome events for majors, monthly equity and inclusion events, gender neutral bathrooms, increased attention to the mental health of graduate students, improvements to the departmental help room, and more inclusive departmental promotional materials. These structural changes provide strong evidence of the DAT's impact on the department, creating infrastructure to support improvements in student outcomes.

Using institutional data, the DAT has been able to document its impact. Four years after the formation of the DAT, the enrollment of women in the major has increased from 13% to 16% and of URM students from 9% to 15%; these data provide correlational evidence of the DAT's impact, indicating a promising trend. In addition, the DAT has resulted in ongoing interactions between faculty, student, and staff in a way that did not happen before the DAT was created.

NOT ALL DATs ARE THE SAME

The above outcomes demonstrate the potential of DATs to create lasting, meaningful change, but such changes are not guaranteed. To illustrate this, we tell the stories of two “composite” DATs that illustrate two general trajectories a DAT may take. These composites are based on our extensive dataset, which includes over 75 interviews with DAT members, thousands of pages of meeting minutes, and artifacts created by DATs.

The following stories represent common patterns drawn from 5 years of working with real departments, but we have aggregated results from multiple departments to highlight key features while protecting the identities of any particular department. Department A highlights many of the features of a DAT that can make it effective, whereas Department B shows what can happen when things go wrong.

Department A

Student exit surveys have revealed a number of issues within Department A: students leave the program without strong connections to relevant industries, the student body is relatively homogeneous, and some students have reported feeling disconnected from their professors. The department chair has been aware of these issues for some time but was not sure how to proceed.

After an initial consultation with the DAT project team, the chair e-mailed her department seeking volunteer DAT members; she recruited four faculty members and one staff member. One of the faculty members invited two undergraduate students from a departmental club, and they joined as well. The chair intentionally chose *not* to participate in the DAT to provide space for the DAT members to make decisions as they saw fit.

The DAT developed a shared vision by articulating their aspirations for an “ideal student” graduating from their major. The DAT members organized their ideas on sticky notes and rearranged them to find themes. Emergent themes included: technical skills, alumni connections, and a sense of belonging to a disciplinary community. This activity helped all DAT members find common ground and feel ownership over the vision. Ultimately, the DAT decided to focus on the last two themes.

DAT members then brainstormed ideas and drew from evidence-based practices for building faculty–student connections in the department. The DAT started building new structures within the department: a social media group, a welcome event for new majors, and an equity-focused brown bag meeting. The DAT carefully collected data to document the impact of their work and received departmental approval to create a standing committee to carry it on.

The committee included faculty, students, and staff, who drew on concrete strategies that they learned from the DAT—building a shared vision, focusing on outcomes, using data to guide their work, and externalizing progress—to support their work. The committee developed an assessment plan for measuring the health of the student community and its impact on recruitment, success, and student persistence.

Department B

Department B wanted to improve the experience of majors in their upper-division courses. Departmental leadership had proposed a few solutions, including improving research opportunities, revising the upper-division course sequence, improving advising, and updating display cases to better showcase the major.

It needed a group to make these changes happen. The department chair appointed five faculty members to a DAT. The chair chose influential faculty members but did not include students or staff. The chair participated as well, but because of his busy schedule, he could only attend meetings intermittently.

The DAT unenthusiastically participated in the shared visioning activities. They wanted to “get right to work” and begin implementation even without clearly defined goals or a landscape analysis. The DAT members rejected support from the facilitators to focus on group process and instead preferred to talk in an unstructured way.

Eventually the DAT encountered problems. Faculty members had competing proposals for how to revise the upper-division course sequence, but they had no agreed-on goals to guide their decision making or norms for productive collaboration. This resulted in arguments about academic freedom, and ultimately one of the DAT members resigned from the DAT. The chair was hesitant to intervene, because he did not want to offend any faculty members.

One semester later, the DAT had little to show for its efforts. To make visible progress, it decided to update departmental displays and flyers for recruiting students. These were simple tasks that could be completed quickly. Again, DAT members argued about how best to proceed, and in the end the task was delegated to the two non-tenured members of the DAT.

LESSONS FOR DEPARTMENTAL LEADERS FROM THESE DATs

While the majority of DATs we have facilitated look much like Department A, we have had experiences like Department B. Often, these issues can be tied to underlying aspects of departmental culture and identity (e.g., toxic patterns of interaction; devaluing deliberate, process-focused work in favor of fast, “get it done” work). Still, departmental leaders have significant influence over how a DAT can play out in practice.

In Department A, the chair solicited members who voluntarily chose to participate, she ensured that group had a diverse membership, and she delegated authority to the DAT. All of these choices supported DAT participant agency; she empowered the group to make a positive change and give them latitude to determine where they wanted the change to go. Because they had this freedom, they were more open to following the facilitators’ lead in adopting the best practices for change they suggested. They also felt more ownership over the DAT’s work, which helped to keep them going through frustrations. At the same time, the DAT was not a wholly autonomous body; DAT members still needed to

collect data from the department, communicate with the chair, and gain the support of the faculty as a whole. The chair helped the DAT in these activities.

In contrast, Department B’s chair appointed its DAT’s members, chose only faculty, and joined the group himself. He also framed the DAT as existing to solve particular problems outlined by him. This encouraged DAT members to view the DAT’s work as an assignment that they needed to complete so that they could move on to things that they perceived were more important, rather than as an opportunity to create change that they found mutually meaningful and desirable. This also discouraged DAT members from engaging with the facilitators’ suggested practices, because they were seen as distractions in the short term even though they would have helped the group achieve positive outcomes in the long term. The lack of functional group processes led to infighting and an inability to make decisions, which the chair did not address despite his presence in the DAT. Despite spending a lot of time meeting, the DAT ultimately did very little.

GOING FORWARD

In just 5 years, the DAT model has matured into an evidence-based model for making lasting changes to academic departments. DATs are flexible—they take the local context and culture of a department into account by customizing facilitation and cultivating ideas from as many stakeholder groups as possible. This flexibility overcomes the limitations of externally imposed, context-insensitive change initiatives. Moreover, the DAT model is designed to work synergistically with other campus efforts, and we have seen examples of this at CU with the TQF initiative and at CSU with SS12.

The outcomes produced by DATs represent the type of broad-scale, structural changes that are needed to improve undergraduate education in a sustainable way. Additionally, all DAT participants have the opportunity to grow as change agents because of DAT facilitators’ focus on process as well as products. As they move on to other roles in the department, this growth can impact other aspects of the department, potentially leading to long-term cultural shifts in alignment with the core principles. Thus, the DAT process is just as critical as the actual structural outcomes of the DAT. We urge more university leaders to take up the DAT model, or a variant, to support change at the departmental level. ☐

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REFERENCES

- Austin, A. E. (2011). *Promoting evidence-based change in undergraduate science education*. East Lansing, MI: Michigan State University.
- Corbo, J. C., Reinholz, D. L., Dancy, M. H., Deetz, S., & Finkelstein, N. (2016). Framework for transforming departmental culture to support educational innovation. *Physical Review Physics Education Research*, 12(1), 010113. doi:10.1103/PhysRevPhysEducRes.12.010113
- Corbo, J. C., Reinholz, D. L., Dancy, M. H., & Finkelstein, N. (2015). *Departmental Action Teams: Empowering faculty to make sustainable change*. Paper presented at the Physics Education Research Conference 2015, College Park, MD. doi:10.1119/perc.2015.pr.018
- Fairweather, J. (2008). Linking evidence and promising practices in science, technology, engineering, and mathematics (STEM) undergraduate education. *Board of Science Education, National Research Council, The National Academies, Washington, DC*. Retrieved from http://otl.wayne.edu/wider/linking_evidence--fairweather.pdf
- Henderson, C., Beach, A., & Finkelstein, N. (2011). Facilitating change in undergraduate STEM instructional practices: An analytic review of the literature. *Journal of Research in Science Teaching*, 48(8), 952–984.
- Kezar, A. (2011). What is the best way to achieve broader reach of improved practices in higher education? *Innovative Higher Education*, 36(4), 235–247. doi:10.1007/s10755-011-9174-z
- Kezar, A. (2014). *How colleges change: Understanding, leading, and enacting change*. New York, NY: Routledge.
- Quan, G. M., Corbo, J. C., Falkenberg, K., Finkelstein, N., Geanious, C., Ngai, C., ... Wise, S. (2019). Designing for institutional transformation: Six principles for department-level interventions. *Physical Review Physics Education Research*, 15(1), 010141. Retrieved from <https://doi.org/10.1103/PhysRevPhysEducRes.15.010141>
- Rainey, K., Corbo, J. C., Reinholz, D. L., & Betterton, M. (2016). Improving representation in physical sciences using a Departmental Action Team. Paper presented at the Physics Education Research Conference 2016, Sacramento, CA. doi:10.1119/perc.2016.pr.061
- Reinholz, D. L., & Apkarian, N. (2018). Four frames for systemic change in STEM departments. *International Journal of STEM Education*, 5(1), 3. doi:10.1186/s40594-018-0103-x
- Reinholz, D. L., Corbo, J. C., Bernstein, D. J., & Finkelstein, N. (2019). Evaluating scholarly teaching: A model and call for an evidence-based approach. In J. Lester, C. Klein, A. Johri, & H. Rungwala (Eds.), *Learning analytics in higher education: Current innovations, future potential, and practical applications* (pp. 69–92). New York, NY: Routledge.
- Reinholz, D. L., Corbo, J. C., Dancy, M., & Finkelstein, N. (2017). Departmental Action Teams: Supporting faculty learning through departmental change. *Learning Communities Journal*, 9, 5–32.
- Reinholz, D. L., Corbo, J. C., Dancy, M. H., Deetz, S., & Finkelstein, N. (2015). Towards a model of systemic change in university STEM education. In G. C. Weaver, A. L. Childress, & L. Slakey (Eds.), *Transforming institutions: 21st century undergraduate STEM education*. West Lafayette, IN: Purdue University Press.
- Reinholz, D. L., Ngai, C., Quan, G., Pilgrim, M. E., Corbo, J. C., & Finkelstein, N. (2019). Fostering sustainable improvements in science education: An analysis through four frames. *Science Education*, 103(5), 1125–1150. Retrieved from <https://doi.org/10.1002/scs.21526>
- Reinholz, D. L., Pilgrim, M. E., Falkenberg, K., Ngai, C., Quan, G., Wise, S., ... Finkelstein, N. (2018). Departmental Action Teams: A five-year update on a model for sustainable change. In *Proceedings of the Reinvention Collaborative 2018 National Conference*. Arlington, VA.
- Schein, E. H. (2010). *Organizational culture and leadership*. San Francisco, CA: Jossey-Bass.
- Wieman, C. (2017). *Improving how universities teach science: Lessons from the Science Education Initiative*. Cambridge, MA: Harvard University Press.