

Exploring faculty's explanations of enrollment issues: where does responsibility and control reside?

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Google Drive Link

Motivation

- In physics, faculty online learning communities, and other shared professional spaces, have primarily centered around curriculum and instruction [1,2].
- The Departmental Action Leadership Institute (DALI), brings a similar approach to apprenticing physics faculty (change leaders) into strategies for sustainable institutional change and facilitation practices associated with leading change teams [3,4].
- Better understanding how DALI applicants are writing about the state of their programs can inform developers of resources in their recommendations and community engagement activities.

Enrollment challenges

- From results presented in an APS report, more than 70% of surveyed departments faced top or moderate challenges related to recruitment and retention [5].
- In PER, recruitment and retention improvement efforts have focused on many different spaces:
 - course reform efforts [6],
 - Learning Assistant programs [7],
 - inter-institutional partnerships [8], and
 - Long term peer groups [9].

Research questions

- What sources of enrollment challenges and opportunities for change are described in DALI applications?
- What forms of responsibility and control are expressed within the DALI applications in relation to enrollment challenges?

Responsibility and control

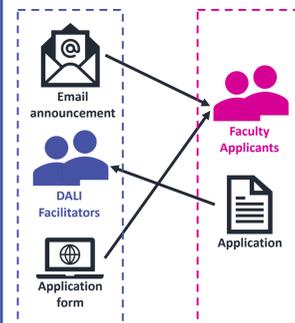
- Control: the influence expressed by applicants over the future of their programs.
- Responsibility: the acknowledgement of applicants' own contributions, positive or negative, to the current state of their programs.
- Each can be understood through models such as stewardship, collective leadership, or a culture of assessment [10-12].
- While the applications may flatten complex stories, understanding the way in which applicants frame their responsibility and control is valuable when apprenticing into effective change practices.

	All	Accepted	Rejected
Total	18	5	13
<i>Inst. Char.</i>			
Public	13	5	8
Private	5	0	5
R1+R2	7	3	4
MSI	6	1	5
<i>Phys. Deg.</i>			
PHD	4	1	3
MS	3	1	2
BS/BA	11	3	8

Doctoral universities of very high (R1) and high (R2) research activity as defined by Carnegie classification; Minority Serving Institution (MSI) designations as defined by the U.S. Department of Education; highest physics degree awarded (Phys. Deg.) as reported by departments in their applications and confirmed via public department websites.

Context and analytical approach

- Our analysis of DALI applications borrows from genre analysis methods, situating this work in the intertwined contextual features of the *genre* [13, 14].
- A genre is a distinct form of communication that shares common styles, purposes, and communities of practice [15, 16].



Setting: The size and type of each applicant's department and relationship between faculty.

Focus and Purpose: The focus is on the undergraduate physics program—its history, current challenges, and future—with the goal of being included in DALI. Informed by the related texts.

Author-Audience Relationship: The authors are physics faculty, and the audience is the facilitators who decide admittance to DALI. This motivates the applicants to write to gain favor with the facilitators.

Community Values: All authors are assumed to be members of the larger physics academic community, with shared values around the continued improvement of undergraduate physics programs.

Results

Student-associated sources of problems

The demographics of students who attend their institution is used to explain a perceived lack of math preparation, which impacts their retention numbers:

"Student enrollment and retention has always been and remains one of these challenges. Much of this challenge is driven by socio economic background of many [institution] students who often come to college substantially underprepared. Weak math skills prevent these students from entering [the] physics program on time to graduate in 4 years and often lead students to failing their first math/physics course and dropping from a physics major."

"Visibility" and students' choices are used as a reason for low enrollment, displacing responsibility from the faculty:

"The reasons for the low enrollments are no doubt complex. We believe the main problems have to do with a general lack of visibility among prospective students in the sciences generally, not just physics. As such, we feel that most of the problem is beyond our control. We built a fine physics program and there is no reason it should not be thriving, particularly given the rise in interest in physics as a major over the past 20 years."

The demographics of students are connected to the ascribed belief that majoring in physics does not lead to an immediately successful career:

"However, at [institution] the problem [of recruitment] is exacerbated by the fact that many of our students come from underprivileged backgrounds and many of them are first generation college students. Our students are understandably focused on improving their lives and the lives of their families by getting a good job. Students do not see a physics degree as something that is immediately valuable in the job market."

Organizational challenges and competition

The organizational changes that are outlined by applicants are described as outside of their control and are seen to have been detrimental to the recruitment and retention of their students:

"Historically, the [d]epartment was housed in the College of Engineering [...]. As part of an academic revitalization program, Physics was moved into a new College of Natural Sciences [...]. Since the move from Engineering about ten year[s] ago, enrollment has steadily declined."

When competition between institutions is discussed as a source of enrollment challenges, the authors present a narrative of students being recruited away from their programs, without much they can do to keep these students:

"The [flagship state university] [...] began giving more needs-based scholarships to undergraduates than they ever had before. This may have a significant effect on where potential physics and engineering majors choose to go to school. While a high percentage of graduates from [state] high schools might be better served at an institution such as [author's institution], where teaching is the main focus and the environment is more nurturing, students are naturally going to be attracted to the flagship institution. I think we offer an excellent program for undergraduates, our challenge is to "get the word out" to those who need to hear it"

Curriculum change as a solution

The course reforms are the most proposed solution and are mainly driven by a desire to bring in students who are framed as under-prepared in math to the physics major:

"We would like to change our first year curriculum so that incoming physics majors can start these physics classes sooner. We are also interested in adopting research-based pedagogies that have been shown to improve retention."

Programs that have already begun their curriculum changes look to DALI to provide ways to assess and modify their efforts:

"We have restructured our curriculum to reduce barriers to entry and to sustain engagement using bridge courses. We have also incorporated multiple hands-on and computational elements into our program in an effort to appeal to a variety of interests. However, we have not been able to achieve and sustain a critical mass of physics majors. As part of DALI, we would like to get feedback and to develop better assessment tools and models to help us improve these efforts."

Conclusions

Applicants must try to explain their complex enrollment challenges to motivate their acceptance into the DALI.

Most authors avoid placing responsibility of challenges on the faculty, instead putting it onto other factors.

These proposed change projects are most often related to curriculum reform.

A goal of DALI is to channel this sense of responsibility and control into an *inquiry-stance* toward the sources of challenges, mobilizing collective action toward a vision of a department that embraces multiple paths for change.

References
See the Google Doc link

