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A Faculty-Led, Community-Building Program That Enhances Student-Faculty Connections within Biology

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Connections between students and faculty on campus may influence students' sense of belonging, and a greater sense of belonging has a positive effect on student success. We developed a low-cost, faculty-led program of community-building events and implemented the program in the biology department at a small liberal-arts institution with the goal of improving students' sense of community. Student responses to surveys indicated that the majority of students felt connected to faculty and students in the department; however, Black or African American students initially felt a lower level of connection to faculty than did white students. After implementing our series of community-building events, students surveyed reported high levels of satisfaction with the events. Furthermore, there was a trend toward a higher percentage of Black or African American students than white students reporting that they were more likely to reach out to faculty after participating in the community-building events. Thus, our low-cost program improved connections between students and faculty in the biology department. Collectively, our results suggest that academic departments can implement community-building programs to improve students' sense of belonging.

KEYWORDS community-building events, diversity, faculty-student interactions, GPA, inclusion, undergraduate belonging

PERSPECTIVE

Student retention is a top priority for many colleges and universities across the United States. There is a particular emphasis on retention within STEM majors, as over 60% of students who declare STEM majors do not graduate with a STEM degree (1). Furthermore, the discrepancy in graduation rates across racial and ethnic groups increased from 1996 to 2011 (2). One strong predictor of student retention is a sense of social belonging (3), as students who have a greater sense of community have higher expectations that they will graduate (4). Student's sense of belonging differs based on demographics and is intersectional. For example, white students have a greater sense of belonging than do African American, Hispanic/Latino, and Asian students (5, 6), and female students who are nonwhite and/or members of other minority groups have the lowest sense of belonging in STEM fields (6, 7). Feeling a sense of belonging may affect students' persistence to complete a degree (8), making this an important consideration for STEM programs seeking to improve student success and increase retention and graduation rates.

Characteristics of both students and the academic institution can affect sense of belonging (9). Elements of the college experience that can influence a sense of belonging include residence hall life, involvement in cocurricular activities, and course-related student-faculty interactions (5). Community building events often occur within groups established on campus, such as residence halls, student clubs, and classes (10, 11). Building a sense of community within academic departments is also important given that students' academic motivation is influenced by the quality and frequency of student interactions with faculty (12), and academic engagement positively affects students' sense of belonging (13). There are a variety of ways to create community within a department, including promoting programs that contribute to student academic success and hosting social events (14).

Various interventions and programs have been developed with the goal of increasing students' sense of belonging to improve academic performance, retention, and persistence (15, 16, 17). At some universities, programs that cultivate interpersonal and disciplinary connections among students, such as peer mentoring programs, have improved student retention and increased enrollment, even during the COVID-19 pandemic (18). However, many institutions do not have the resources to support large-scale initiatives. Lower-cost community-building events at the departmental level have the potential to contribute directly to students' sense of belonging.

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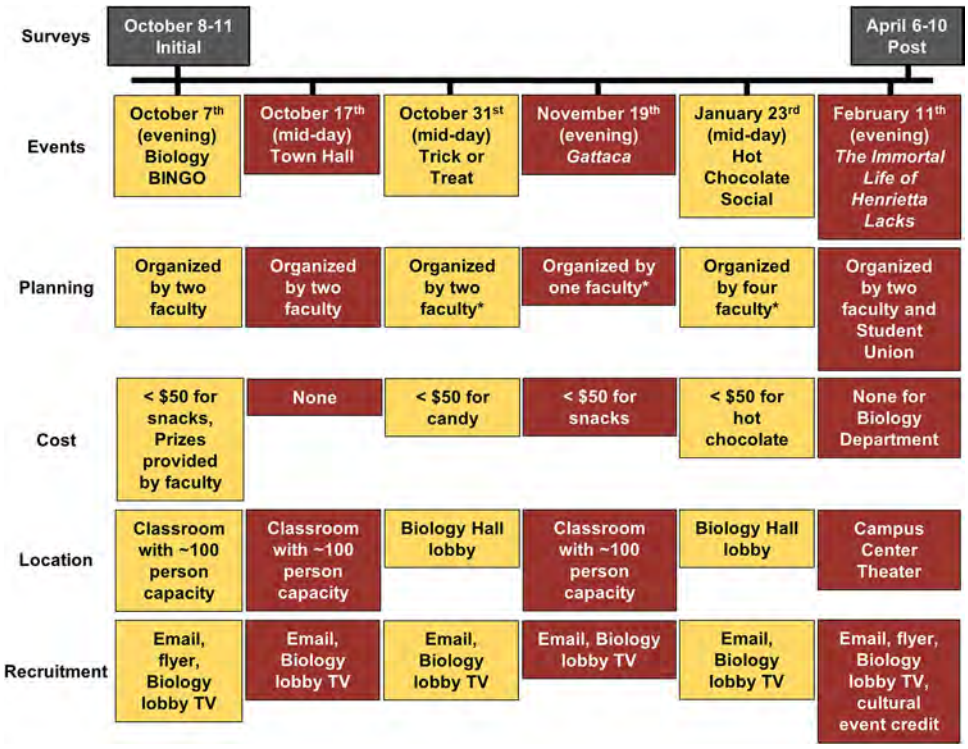

FIG 1. Community building program roadmap, with information about resource needs (planning, cost, location) and recruitment methods. * indicates assistance was provided by the Department of Biology Administrative Coordinator. The Student Union is the student association that programs events for the campus community. Cultural events include films, art exhibitions, musical performances, and lectures; attending a specific number of cultural events is a graduation requirement. No events were held after February 2020 during the 2019-2020 academic year due to COVID-19.

A committee of faculty in our department at a small liberal-arts institution developed a low-cost, community-building program to foster connections between students, their peers, and faculty within the biology department in order to cultivate a sense of belonging among our students. Our biology department had 409 declared majors in fall 2019 (76% female, 38% Black or African American). The first-time, full-time freshman to sophomore retention rate in biology from fall 2019 to fall 2020 was 41.5%, which is similar to national retention rates in STEM majors (1). Although increasing the diversity of faculty and staff has been a priority, our department was 37% male and 77% white in fall 2019. This composition does not reflect the diversity among our student population, which may impact the sense of social belonging among students and may be similar to what students are experiencing in other departments and at other institutions.

COMMUNITY BUILDING PROGRAM

Between October 2019 and February 2020, the committee organized several community-building events within the biology department that provided opportunities for students and faculty to interact outside typical classroom or advising contexts: (1) biology BINGO game night, (2) town hall meeting (advising session), (3) trick or treat gathering (costumes encouraged), (4) showing of the movie *Gattaca*, (5) hot chocolate social, and (6) showing of the movie *The Immortal Life of Henrietta Lacks* (cosponsored with our university's Student Union) with a biology faculty panel discussion after the movie (Fig. 1; Appendix 1). For biology BINGO, we created a list of biology terms that spanned disciplines (biodiversity, cell/molecular biology, ecology, evolution, genetics, physiology) and used My Free Bingo Cards (https://myfreebingocards.com/bingo-card-generator) to generate BINGO cards. The town hall meeting included a brief PowerPoint presentation and a faculty panel. The trick or treat gathering and hot chocolate social were both drop-in events that facilitated impromptu meetings between faculty and students and encouraged informal conversation; these events were held in the common area of the biology building. The showing of *The Immortal Life of Henrietta Lacks* was open to all students on campus. We used a variety of methods to recruit students to participate in events (Fig. 1), and we had diverse racial representation among faculty (full-time or adjunct) at a number of the events.

STUDENT FEEDBACK

Our committee conducted an initial survey of biology majors in October 2019 that focused on advising and retention. Students were asked about their perceptions regarding interactions between faculty and students to rank items in

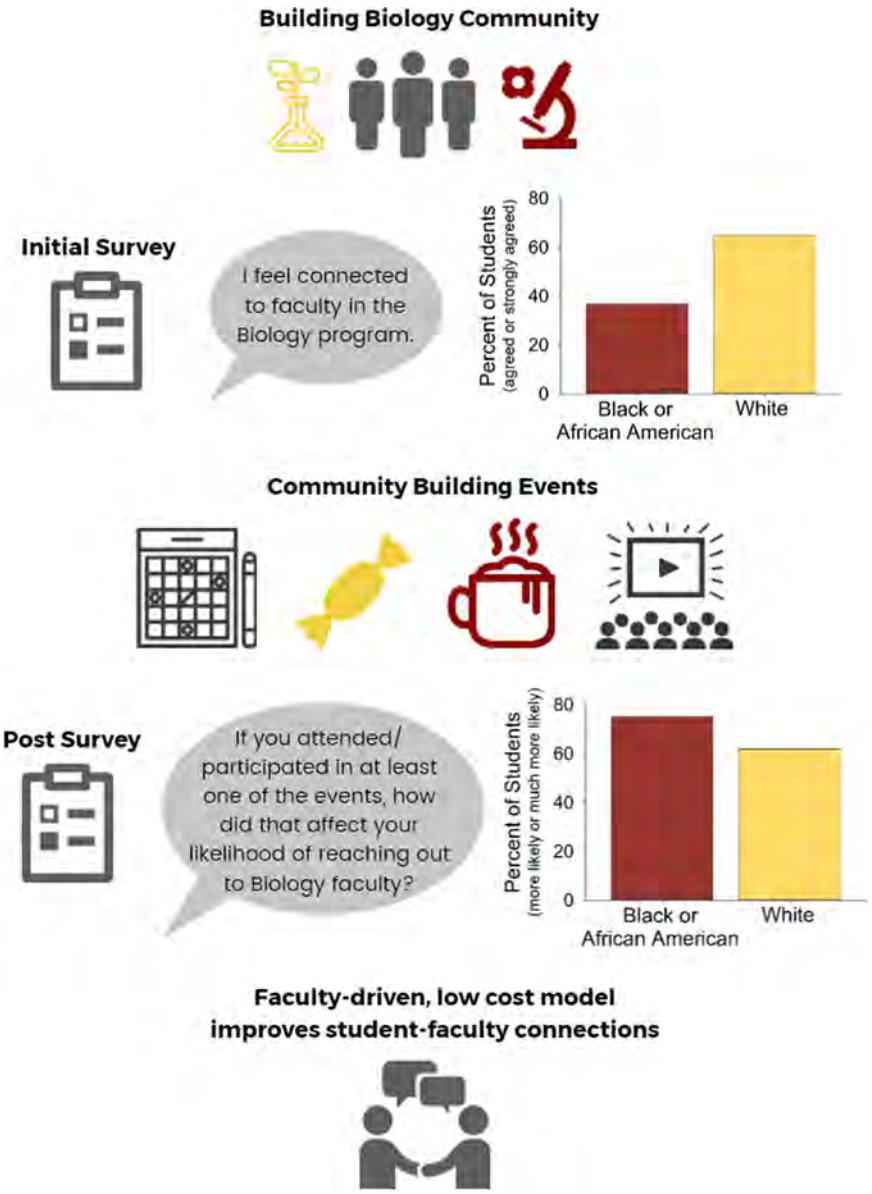

FIG 2. Low-cost, faculty-driven community building events strengthen student-faculty connections in biology (25).

order of their importance to their success. Of the 96 students that responded to the survey, nearly 75% agreed that they are comfortable seeking advice from biology faculty who are not specifically their academic advisor, and responses did not vary based on student GPA or demographics. Surprisingly, students felt slightly more connected to faculty than to other students. However, feelings of connection to faculty were higher for students with a high GPA than students with a low GPA and for white students than Black or African American students (Fig. 2). Providing opportunities for biology student social gatherings and community building was ranked as the first or second most important item for success by one-third of students.

We conducted a postprogram survey of biology majors in April 2020 (after pivoting to virtual instruction) that focused on the community-building events. Students were asked about their satisfaction with the events and the effects of attending events. Of the 105 students that responded to the postprogram survey, 57% attended at least one event. Over 90% of students were satisfied with the events they attended, and 63% of students indicated that attending one event made them more likely to attend another event. Furthermore, the majority of students (63%) indicated that attendance at an event made them more likely to reach out to faculty. Additionally, 13% more Black or African American students than white students responded that they were more likely to reach out to biology faculty after attending an event (Fig. 2).

REFLECTIONS

Our community-building program to promote student and faculty interactions yielded several promising outcomes: (i) student attendance at events indicated an interest in

engaging in the department; (ii) students were satisfied with the events; (iii) for some students, attendance at events seems to have facilitated a greater sense of connection to biology faculty; (iv) encouraging students to attend at least one community-building activity may be enough to engage students in the departmental community; and (v) attendance at events has the potential to bridge the connectivity gap experienced by Black or African American students. Facilitating connections and engaging students in the departmental community could have a positive effect on students' sense of belonging, which has implications for student success and retention.

Student feedback in our initial survey revealed a discrepancy in our students' experiences within the biology major. There was a gap in the feeling of connection between Black or African American students and their faculty, relative to white students (Fig. 2), which was concerning given that interactions with faculty affect students' sense of belonging (5). Student feedback in our postprogram survey indicates that attending an event had a greater impact on Black or African American students' feeling of comfort in reaching out to faculty, relative to white students (Fig. 2), which is a promising trend considering that development of personal connections between faculty and students can contribute to greater thriving in students of color (19). How comfortable students feel reaching out to faculty may depend on the number and diversity of faculty that attend community-building events, reinforcing the call for universities to increase diversity of faculty and staff. More targeted strategies such as developing a department-level diversity, equity, and inclusion committee that includes both faculty and students and implementing diversity reading groups to foster discussion between faculty and students (20) may help mitigate the connectivity gap between students and faculty. Furthermore, showing and discussing movies that relate to diversity and equity, such as *The Immortal Life of Henrietta Lacks*, might positively affect perceptions of the racial climate on campus, which is a predictor of sense of belonging for students (5), including women in STEM (21).

Among our biology students, feelings of connection to faculty were higher for students with higher GPAs. This was not unexpected considering that student GPA is positively correlated with the quality of student relationships with faculty (22) and that a low feeling of belonging has a negative impact on students' GPAs (23). Thus, we recommend that faculty make particular effort to encourage students with lower GPAs to participate in community-building events in an attempt to improve connections between students and faculty and a sense of belonging for students.

PROGRAM SUGGESTIONS

Our community building program has the potential to be implemented at other colleges and universities with similarly positive results. Based on our experiences, we offer the following recommendations to departments considering implementing a similar program.

Partnering with other organizations on campus to host events when possible can be beneficial and promote biology events beyond the department. Compared to our department, our Student Union has more resources available, including permission to show movies, and more experience planning and advertising campus events. In our case, cosponsoring the viewing of *The Immortal Life of Henrietta Lacks* with our Student Union led to our most highly attended event. Students who participated also received a university-wide incentive through cultural event credit, further encouraging student participation. This event also allowed us to share biology perspectives with a wider audience and perhaps recruit students to the major or minor.

While the monetary cost for our events was low, planning events did require faculty time and effort. We divided the work among faculty to share responsibility, and organizers found the experience rewarding. Our program is a significant contrast to well-established and well-funded programs at larger universities (18). However, our faculty-driven, low-cost model can be applied to a wide range of institutions, including technical/community colleges and other small liberal arts universities. Although we were able to host many events with minimal cost, greater financial investment may be necessary for the long-term success of community-building programs in larger academic departments, especially as faculty workloads continue to increase.

During the 2020–2021 academic year, we faced challenges to our community-building program due to the COVID-19 pandemic. We transitioned to virtual events, which included Zoom trivia, Jeopardy! night, and a biology-themed meme contest. Anecdotal evidence indicates that students enjoyed these virtual events; thus, we recommend hosting virtual events in addition to in-person events in more traditional years for several reasons. First, one of the most commonly reported reasons that students did not attend events was because the events conflicted with their schedules, and organizing virtual events may allow for greater flexibility for when events can be scheduled. Second, students living off campus have a lower sense of community than students living on campus (9), and because virtual events provide opportunities for students to participate even though they are not physically on campus, hosting virtual events might increase participation of commuter students and upperclassmen who have moved off campus. Third, students suggested offering career-related events, and virtual events may permit the participation of recent alumni and catalyze networking opportunities for current students.

CONCLUSIONS

Student sense of belonging can have implications for academic success and retention as well as longer-term impacts on quality of life (24). Our low-cost, faculty-driven, community-building program provided meaningful improvement in faculty-student connections and was well received by students. Interaction between students and faculty also appeared to increase social belonging of Black or African-American students. Our grassroots model can be implemented across all institution types

and is a potentially valuable strategy to support student retention efforts.

SUPPLEMENTAL MATERIAL

Supplemental material is available online only.

SUPPLEMENTAL FILE 1, PDF file, 0.2 MB.

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We declare no conflicts of interest.

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