



# STEM Mentoring Report

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## Introduction

At Yale and across the country, students majoring in the fields of science, technology, engineering, and mathematics (hereafter, “STEM”) face many challenges that their peers in the humanities and social sciences do not. One notable difficulty in the STEM experience is a lack of mentorship. A peer-to-peer mentoring program in each STEM department would markedly improve STEM undergraduate life at Yale by providing important advice on the ins and outs of each major, connections to research and career development opportunities, and a better sense of community within fields that historically have been impersonal and isolating.

## Background

Due to large class sizes and often unavailable faculty, most STEM departments at Yale lack the depth of connections that exist within other fields. Moreover, for much of Yale’s existence, the sciences have been neglected and underfunded. While efforts in the past two decades have sought to improve this historic deficiency, inequality still exists between many of the new STEM departments and other more well-established departments. All of these problems combine to help explain why mentoring in STEM fields is often lacking.

The current state of STEM mentorship at Yale falls in three categories. First, some students receive peer mentoring through student groups and cultural houses. Such groups are often focused on one particular area, such as engineering or research, which means that broader mentorship can be lacking. Moreover, many students are not involved in cultural houses and thus have little access to STEM mentorship through them.

The second form of mentorship comes directly from Yale. Yale requires that each department has a peer mentorship program. Yet, only two such STEM programs exist. The peer mentoring programs currently in place within the MB&B and Economics departments are funded by the Yale College Dean’s Office and are in their pilot years. While a more thorough analysis of these programs will be provided later, such programs ought to serve as the model for what peer mentoring should look like at Yale.

The last form of mentorship is informal advice received from classmates, friends, or first-year counselors. While this form of mentoring can be incredibly useful, it varies greatly depending on the student. The YCC is in favor of more formal means of mentoring to ensure that each student has access to clear, organized, and reliable advice that will help them better navigate their majors.

## Peer Institutions

By and large, Yale lags far behind its peer institutions when it comes to STEM mentoring. At Harvard, each house (comparable to a residential college at Yale) has a dedicated mentor or tutor for almost every STEM department.<sup>1</sup> This strong system provides students with the opportunity to receive advice or support for concerns they might have about classes, internships, or careers—all within the comfort of their houses. Additionally, the Harvard Extension Student Club is a club

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<sup>1</sup><https://osl.fas.harvard.edu/tutors-proctors>

dedicated exclusively to providing mentorship to first-year students.<sup>2</sup> Such assets, along with Harvard's reputation for having better STEM programs overall, provide a strong need for Yale to do more in order to match its biggest competitor.

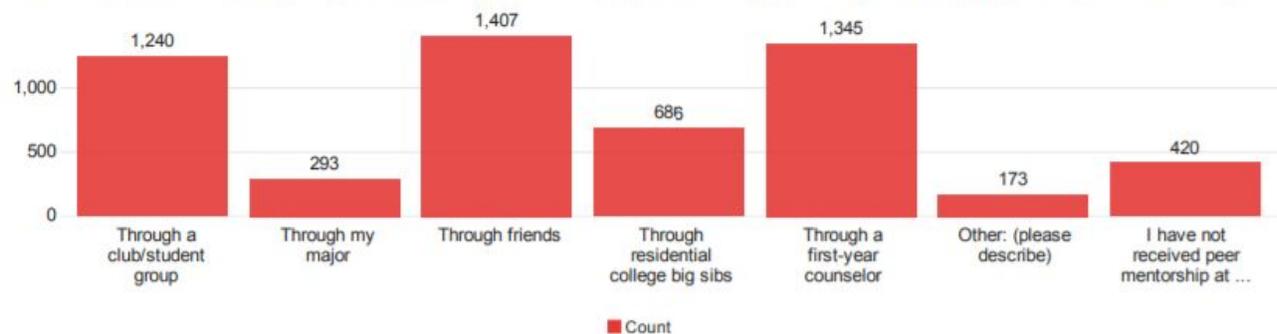
Princeton provides much of its mentorship through the Carl A. Fields Center for Equality.<sup>3</sup> This dedicated center serves as a central hub on campus for students to come together and discuss anything from academics to summer research. Not only does this center provide an unmatched sense of community, but it also offers critical resources to many underserved populations at Princeton. Similarly, the University of Michigan has a central hub where students can go to receive peer mentoring of all sorts. Its Student Learning Center provides connections to research, career planning, study groups, community events, and advice on majors.<sup>4</sup>

The picture painted by these three peer institutions shows exactly how much work Yale has to do to catch up with schools of similar standings.

## Data Analysis

Overall, both focus group responses and survey data supported our conclusions that more can be done with STEM mentorship and that existing mentorship programs often fail to meet expectations.

Q32 - How have you received peer mentorship at Yale? (Select all that apply) - Selected Choice



Across 5564 survey responses, the most common source of mentorship was through friends, with approximately  $\frac{1}{4}$  of the responses. The most popular Yale-backed form of mentorship was through the first-year counselor program. *Notably, only 5% of responses indicated mentorship through majors.* These results show that most students rely on informal means of mentorship, and when they do receive formal mentorship, it is through a program that is only relevant for one of their four years at Yale. Thus, there is a need for more accessible formal mentorship.

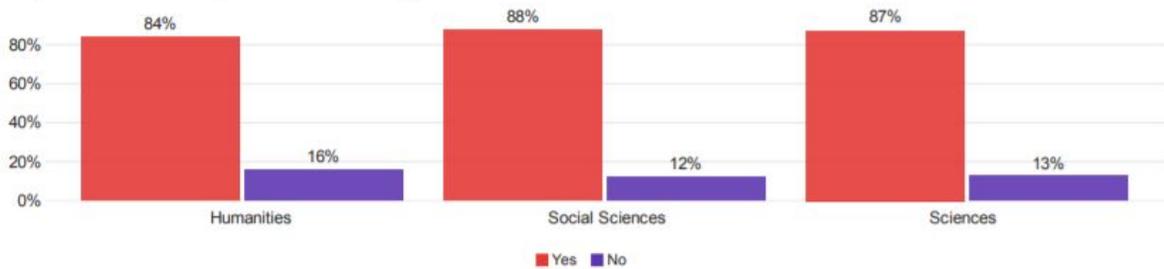
<sup>2</sup> <https://hesa.dce.harvard.edu/>

<sup>3</sup> <http://fieldscenter.princeton.edu/mission/>

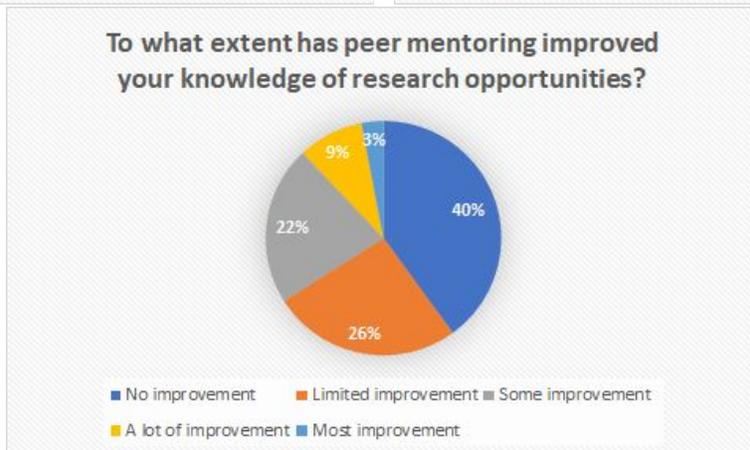
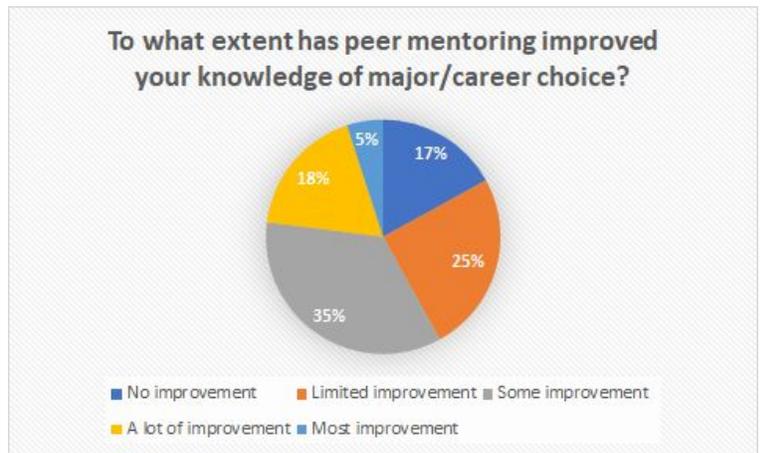
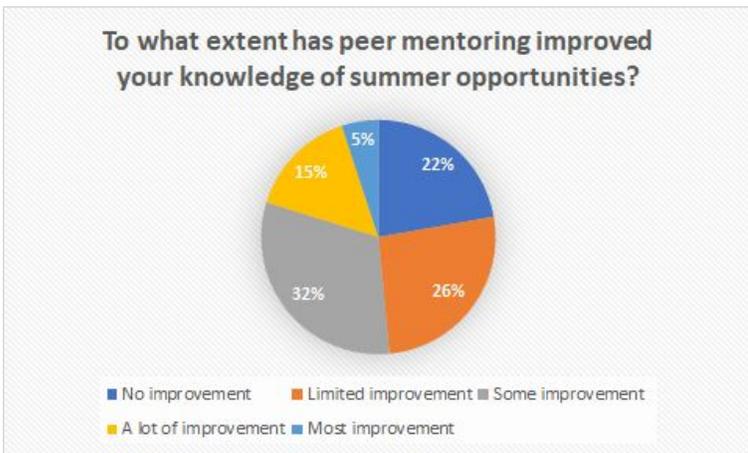
<sup>4</sup> <https://lsa.umich.edu/slc/about-us.html>

Across all fields of study, 88% of respondents indicated that they would be interested in a central hub on campus where students can go to receive peer mentoring. Such strong support speaks clearly to the desires of students on campus.

Q33 - Would you be interested in a central resource on campus that would provide connections to peer mentoring and summer opportunities?



Lastly, Yale’s peer mentoring seems to fall short in several specific areas. 66% of students reported that peer mentoring has led to little to no improvement in their knowledge of research opportunities. When it comes to major or career choice, only 23% of students saw significant improvement in their knowledge due to peer mentorship. Moreover, 80% of students had some, limited, or no improvement in their knowledge of summer opportunities because of peer mentorship. These numbers demonstrate that much can be done to improve how existing peer mentorship at Yale works.



The results of the YCC focus group on STEM mentorship suggested unanimous agreement that mentoring at Yale is unsatisfactory. Students recounted spending hours searching through outdated websites to find summer opportunities because their faculty advisor was not helpful and they had no one else they could ask for help. Another issue these students raised was the lack of an adequate mentor in existing mentorship programs at Yale. Quite commonly, STEM students find themselves paired with a faculty mentor with very different life experiences who may be disconnected from the life of a college student. Having a peer mentorship program would address many of the issues of relating to a diverse group of undergraduates.

Perhaps the biggest takeaway from the YCC focus group on this subject was the success of the MB&B peer mentorship program, in which student mentors host events, study breaks, and office hours to personally guide underclassmen. One of the peer mentors spoke to the focus group on the progress of the program, and its aims were met with strong approval from the students present.

## Recommendations

- 1.) Implement programs similar to the MB&B peer mentorship program in every STEM department. Given the support of the Yale College Dean's Office and the Dean of Undergraduate Education, Pamela Schirmeister, for the project, in addition to the fact that such programs are already required, we feel that this recommendation is feasible and attainable in the coming semester. Like the MB&B peer mentorship program, each program will consist of 4 peer mentors (more or less, depending on the size of the major) who will be available to meet with students and host informal get-togethers throughout the year. We plan to meet with department DUSes to implement the peer mentorship program in each STEM major and raise awareness of them throughout campus.
- 2.) Fund a central space on campus for peer mentoring for all students. While this recommendation will be harder to implement, it seems reasonable to request it given the ongoing construction of the Schwarzman Center. The YCC looks forward to exploring whether space within this new center could be dedicated specifically for peer mentorship. After further research, we will decide whether this is feasible, and if so, create a report recommending such a space.

## Progress

This semester has been a great foundation for this project. The first few months were spent collecting data on the current state of STEM mentorship and beginning to create what we wanted to see changed. We began by interviewing students at peer institutions to see what their STEM life was like. Next, we ran a focus group to see what our peers thought of mentorship at Yale. We supplemented this work by interviewing one of the MB&B peer mentors and getting his recommendations on what the MB&B program could look like in other majors. We also talked with the MB&B DUS to gain his perspective on the program. With all of our data collection complete and our purpose clear, we spent the final phase of the semester advocating for peer mentorship programs in every STEM major. We pitched the idea to the faculty and DUS of the MCDB major

and, after a brief discussion, they decided to pilot the peer mentorship program in the spring of 2019. The department is currently in the process of selecting several mentors, and we will be working with them in January to make sure that the start of the program runs smoothly.

## Challenges

Thus far, we have not run into too many challenges. Our biggest problems relate to finding good times to meet with STEM faculty and administrators. One challenge that we foresee is implementing this program in the smaller STEM majors with fewer resources and students available to be mentors. However, having just one or two mentors in these majors, rather than four or five, would suffice.

## Next Steps

The first week of second semester, we have a meeting planned with Yale's Dean of Science and Quantitative Reasoning, Dean Sandy Chang, to discuss peer mentorship at Yale. Dean Chang created the MB&B program, so we hope to also gain more knowledge of the program and its history from him, as well as to learn the best way to expand the model to other departments. Our plan next semester is to meet with the DUS of every STEM department and pitch the peer mentorship program, meeting with at least one DUS per week, beginning in mid-January. While this plan is certainly ambitious, we hope to see great progress, given the administration's stated support for these initiatives. Based on our meetings in January, we aim to have a concrete grasp on how to successfully pitch peer mentorship programs, and what kind of problems we will encounter. By focusing on the implementation of the MB&B program, we aim to create a template for mentorship programs, which will be useful in future collaborations with the many STEM departments.

## Conclusion

Through our discussions with Yale students in focus groups and the YCC fall survey, it has become increasingly clear that Yale must do more to improve the STEM experience. Yale already lags far behind its peer institutions, and STEM students need new, more formal means of mentorship. Mentoring from peers can be incredibly positive when it comes to selecting a major, finding summer work, or building community.

From what we have gathered from meetings with peer mentors and administrators, it makes sense to implement peer mentorship programs in each STEM department. These mentors would be responsible for providing advice to younger students in the major and hosting events to build community within the major. Moreover, the YCDO has already expressed support for these programs and has funds available to host events. Lastly, and perhaps most strikingly, Yale programs are already required to have departmental mentorship programs. Thus, there is strong momentum heading into the spring semester, and we look forward to turning these recommendations into realities in the near future.