



# Evaluation Report

## Summer Research Experiences at NIMBioS for Undergraduates and Teachers

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# SRE Evaluation Report

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## Participant Evaluation Data

(n = 16)

### Respondent Satisfaction

#### Overall Satisfaction

Figure 1. Overall satisfaction with the research experience

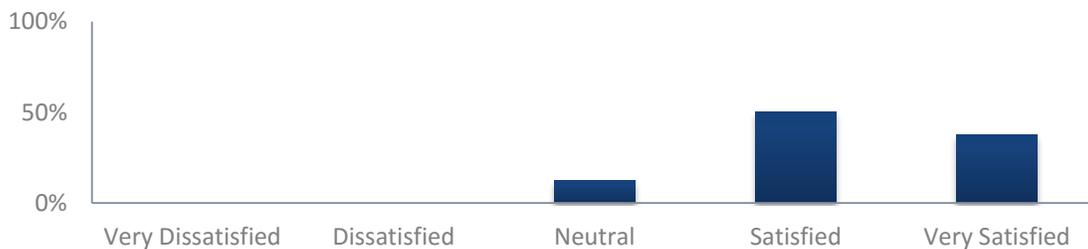


Figure 2. Would you recommend the NIMBioS SRE program to others?



#### *Please explain why you would or would not recommend to program to others:*

*A research experience is always good for any student that is planning to go to graduate school. In particular, NIMBioS SRE is good because here focus on project were you can combine two passions, math and biology.*

*I thought it was very educational and well-structured. I really liked that there were so many optional learning experiences as well*

*I would recommend the program because of the large impact it has made on shaping who I become after my undergraduate career. I learned much about myself from this program, as well as learned much about the people who will become my peers one day. Additionally, the administration staff is top-notch along with Suzanne, which really makes the whole process enjoyable.*

*It gives real insight into independent research and is a great stepping stone for graduate school.*

*It is a great experience to learn about academic research, especially before you have applied to grad school.*

*It is an incredible opportunity to work in an interdisciplinary, collaborative environment as an undergraduate. There aren't many programs in biomathematics that offer this experience. The program also really exceeded my expectations in the amount of lectures, opportunities to meet graduate students and postdocs, and social events. The other SRE students were incredibly talented, and having us all housed on one floor of Laurel Hall was great so we got to get to know each other well. Overall, I learned an incredible amount and had a great summer.*

*It is a wonderful platform for the students wanting to pursue their career in Biological Mathematics.*

*It provides a unique opportunity to delve into mathematical biology.*

*It was very helpful in showing me where I want to go with my future. It was also fun.*

*The program is very beneficial for those interest in grad school and pursue in research interdisciplinary research.*

*This program is one of the few that combines mathematics and biology. It had great facilities, and the people that I met changed my future.*

*Useful in providing the opportunity for students interested in research in mathematical biology*

**Figure 3. To what extent did this research experience meet your expectations?**

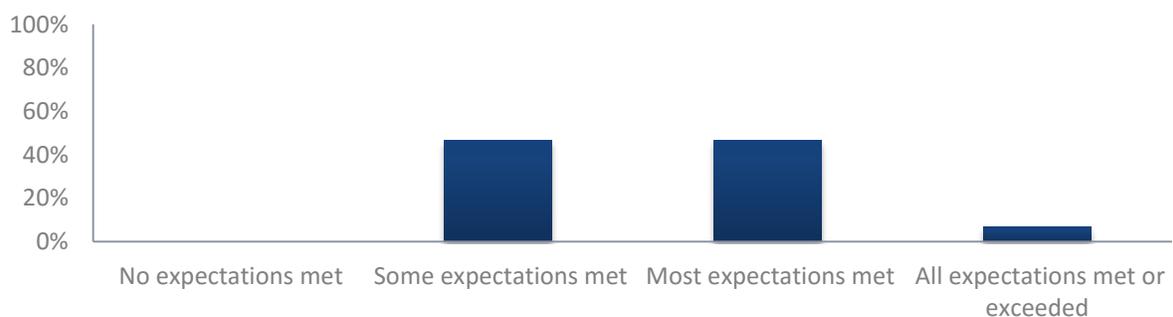
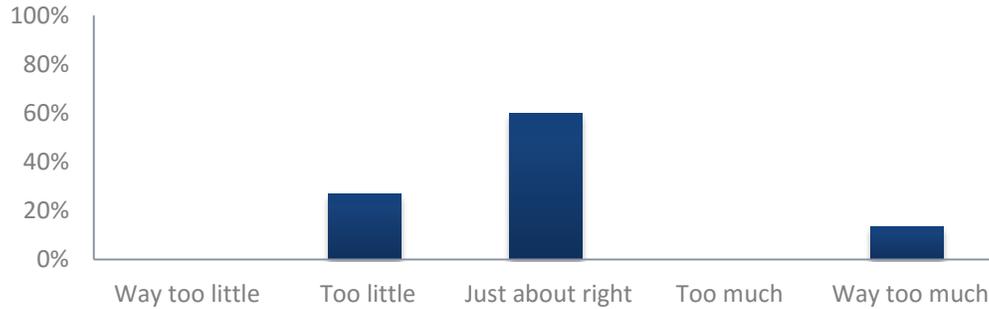


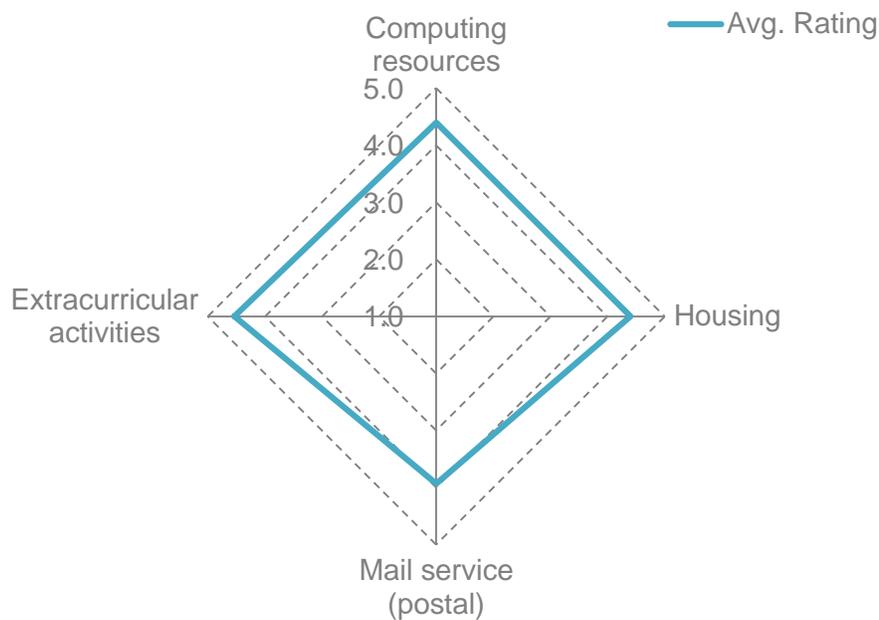
Figure 4. How did you feel about your workload overall?



### Satisfaction with Accommodations

Figure 5. Satisfaction with accommodations

Scale: 1 = Very dissatisfied to 5 = Very satisfied



Please describe any accommodations/supports you needed that were not supplied (if any):

*A tour of the library and/or campus would be very nice at the beginning of the program.*

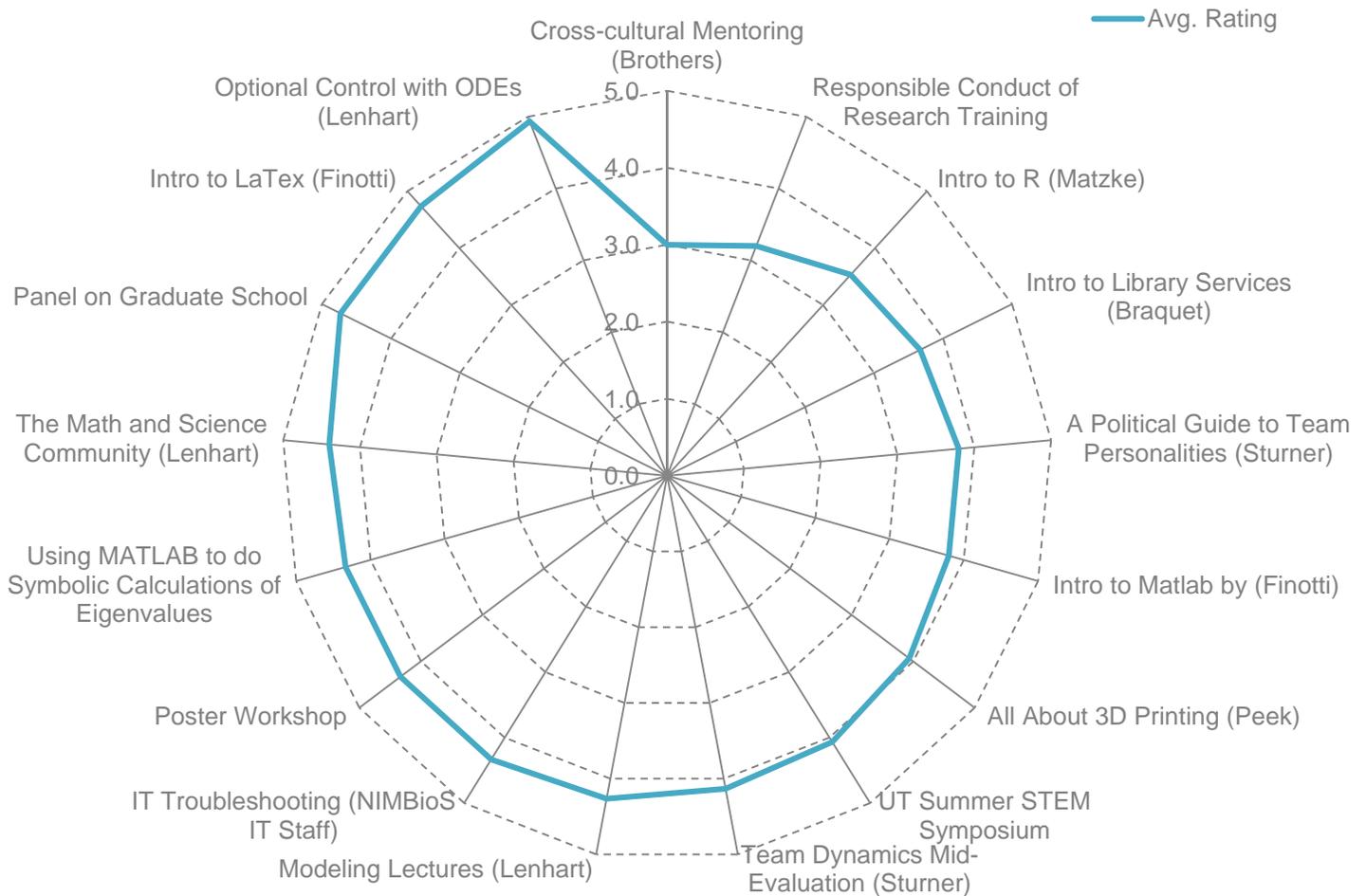
*It would be helpful if we were provided with a micro oven.*

*Microwave in the apartment (this is a must for cooking)*

## Satisfaction with Lectures and Sessions

Figure 6. Ratings for Lectures and sessions

Scale: 1 = Not useful to 5 = Very useful



### Other lectures or sessions you found valuable:

*The ORNL tour seemed really cool, even though I didn't go on it since I thought we might have a lot of work to finish up on that day. I might suggest including it in the NIMBioS program rather than having us sign up for it on our own, to kind of deter that from happening (if that's possible, don't know if it is).*

*I liked when groups invited other groups to attend their lectures, even if the lecture was not directly related to what we were doing.*

*Lectures given by project mentors.*

*Lou Gross gave a talk about stochastic models that was very valuable.*

*Matlab by Buddi Pantha*

*Modelling with Suzanne Lenhart R coding lecture*

*Our ice cream socials with the post-docs at NIMBioS was invaluable. I met people that were currently doing what I wanted to do, and who could give me advice when needed.*

*The graduate school discussion by Ernest Brothers*

**Other comments about lecture or sessions:**

*I rated these based on how useful I thought they were to us as participants in the SRE. For example, the 3D printing lecture I really enjoyed, but it doesn't really seem necessary to the program. On the other hand, I didn't feel like I learned much from the beginner programming lectures (since I already had experience) but I can understand why they're necessary.*

*I wish there had been more lectures and sessions. I understand that there are time restrictions for those who might teach the lectures, but I would have enjoyed even an hour or two extra lectures per week.*

*I wish we had more lectures on R, as it was very relevant to the projects we were working on.*

*Some of the lectures could have a description of what they are covering so the students that have a knowledge of what is going to be taught do not have to spend time in these lectures.*

*The coding lectures should be optional.*

*They were mostly helpful.*

**Satisfaction with Mentors**

Figure 7. Average rating by mentor characteristic

Scale: 1 = Strongly disagree to 5= Strongly agree

**My mentor:**

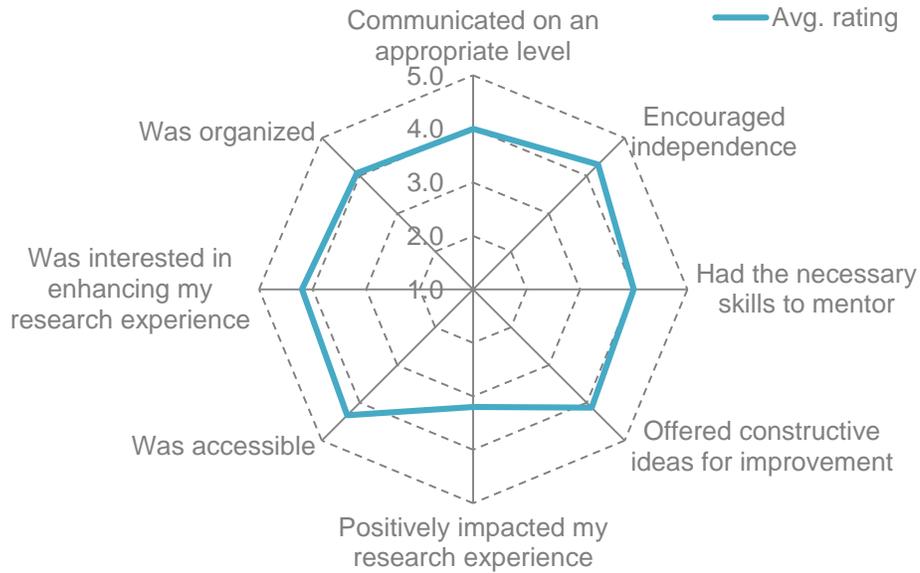
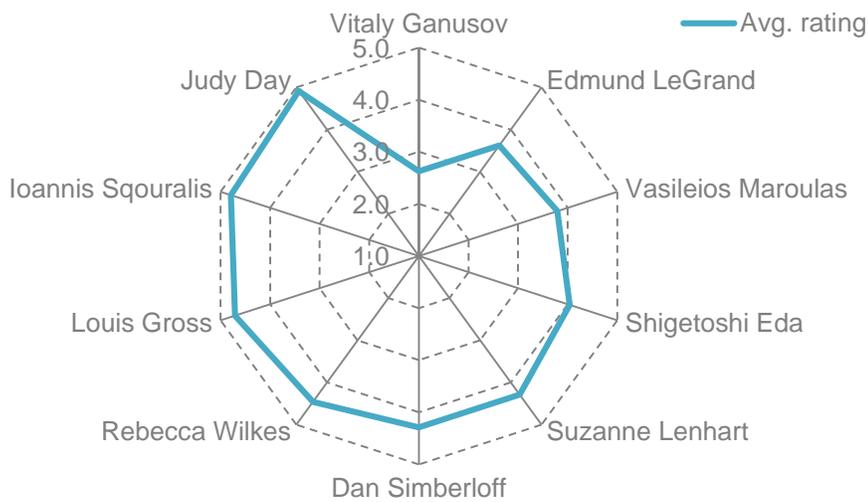


Figure 8. Average rating for all characteristics, by mentor

Scale: 1 = Strongly disagree to 5 = Strongly agree with each characteristics from Figure 7

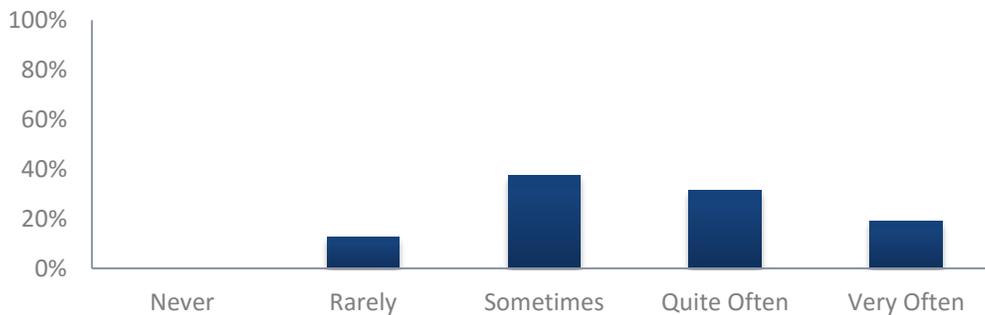


## Communication and Group Dynamics

Figure 9. Did you find that Basecamp was a useful means of communicating within the SRE group?



Figure 10. How often did you feel your research group worked well together?



When your group worked well together, what factors do you feel contributed to the group's success?

*Communication*

*Communication and reasonable distribution of work*

*Communication, a willingness to compromise and collaborate on ideas, clear leadership (either from students or mentors), and specific daily and weekly goals.*

*Communication, commitment and programming skills*

*Daily morning meetings, enough knowledge, drive, sports outside NIMBioS*

*Equal work-effort proved to be the most effective means of success. Not work contribution, but work effort.*

*Good communication and laying out the tasks each of us should do each day.*

*Motivation seemed to be a factor in the group's success. Much of the time, one of our group members often said he "lacked the motivation" to work. As a result, the rest of us*

*had to do more work than what was originally anticipated. When he did choose to work, we made quite a bit of progress and worked somewhat well together.*

*Personalities of the group members and leadership of our mentors. Free flow of ideas and communication.*

*The most contributing factor to our group's success was when we communicating daily what we were doing and what are goal were for that day.*

*We became good friends during the 8 weeks and tried to split the work fairly if possible.*

*We worked well when we had direction. This either came from the mentors or ourselves. For example, after a mentor meeting, we often became very productive for the days after because we knew what we ought to be doing. Sometime after that, we might experience a slow down because it felt like we had finished everything we knew how to on our own. At that point we would further explore tasks that we thought would be apt for our research, but sometimes would need a bit of guidance on how to push forward. That's about when we'd schedule another mentor meeting.*

*Well, I can't actually name a time that my group worked well together, but I will say that we worked best when each person was accountable for their part.*

*What I feel that contributed to our group's success is the communication and understanding that everyone's scientific background is different but we able to come to middle ground.*

**If/when your group was not functioning well, what were some barriers that prevented your group from working well together? How were these barriers overcome (or how do you feel they could have been overcome)?**

*A lack of communication, too much separate/uncoordinated work, lack of direction from the mentors, lack of data. Most of these barriers were overcome by scheduling regular meetings and setting goals as a group. The data problem could have been overcome if we had come in with a project that supplied data. This wasn't a major issue, it was just unexpected and resulted in a lot of time spent searching for data and not learning new topics.*

*Due to the splitting of work, it was not apparent to me of just how little effort my group members were putting into the project until the last few weeks when it was time to put together a paper, poster, and presentation. When the group evaluations were done halfway through the program, I honestly reported that our group was having no issues, as I was not aware of their lack of effort in helping the project along. I feel that this could be overcome by explicitly outlining what work has been contributed by each member of the group to prevent members from not working much, thinking that their group members will pick up their slack. Mentors could also help assign parts of the project (including work on the paper/poster/presentation) to group members as a way of facilitating this.*

*Not well communication, for this reason we created a group text chat in our phone, download Dropbox and use google docs.*

*One member contributed far less than the rest of us because she had trouble understanding the programming.*

*One of our group members did not feel the motivation to complete the work he was assigned to do. Communication was also an issue. When we asked him to do the work he was assigned, he would not follow through. It became more exhausting to ask him to complete his work than to do his work instead. These barriers were not overcome. If the mentor themselves had talked to him about this problem, this barrier may have been overcome.*

*Other teammate not having the same level of mathematical and computational background. Teaching one another and assigning them work that does not require as much background knowledge.*

*Some members had a lack of effort to learn new material, this could have been overcome if the team members put in more effort.*

*Sometimes languages. Asking group members to repeat, slow down. Timely meeting-scheduling daily meetings*

*The division of labor was unequal. I understand that every group member will never perform the same amount of work, but the differences in labor should never be as drastic as they were in our project. Communication was another issue, but I would say a minor one. Another of the most prominent issues was work ethic. When one member is willing to give everything to finish the project and another says that he/she has "lost motivation," nothing good can come of that.*

*We didn't really have times where we were too dysfunctional, but when we were not working at our best, it was due to lack of direction and / or communication. Since it was a group project, everyone needed to have a goal / something to do. We tried to rectify this by having morning meetings where we laid out our goals and gave everyone their own job. (This was partially rectified but we didn't really stick to it completely).*

*We were not communicating and some people ended up doing a lot of the work. We sat down and aired our feelings and figured out ways to equally distribute the work. It worked really well after that.*

*When group members were unavailable to meet. Our group moved to email and online collaboration to address our issues.*

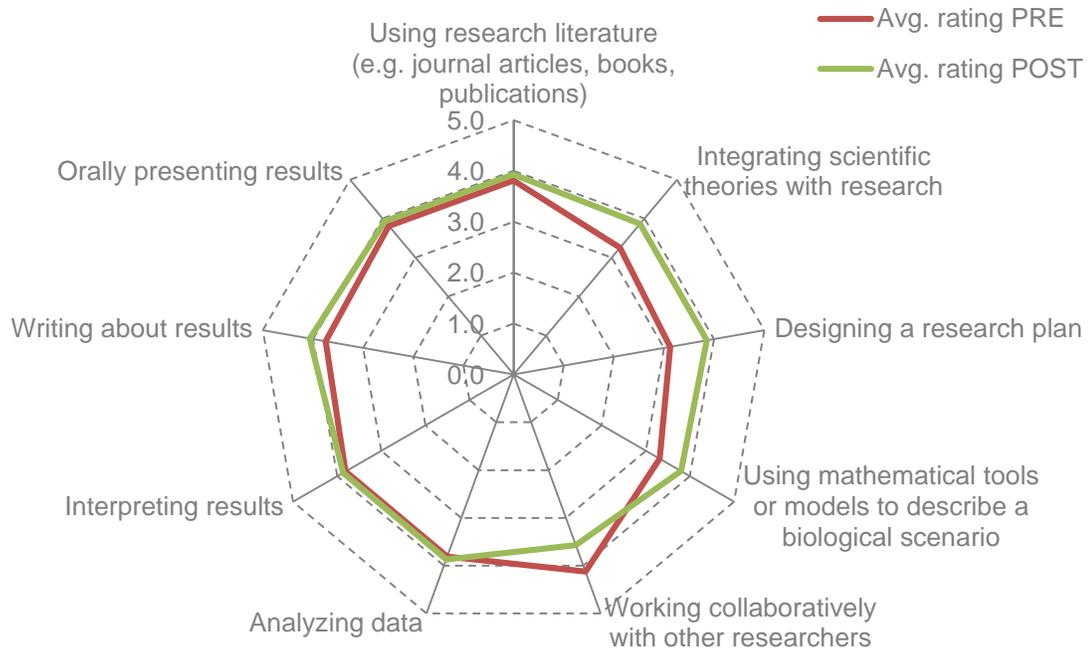
*When not everyone communicating what they were doing. When some group members could only work certain hours of the day. Also, the different levels of knowledge about math held certain group members back.*

## Program Impact

### Participant Skills

Figure 11. Participant pre-and post-program skills, self-reported

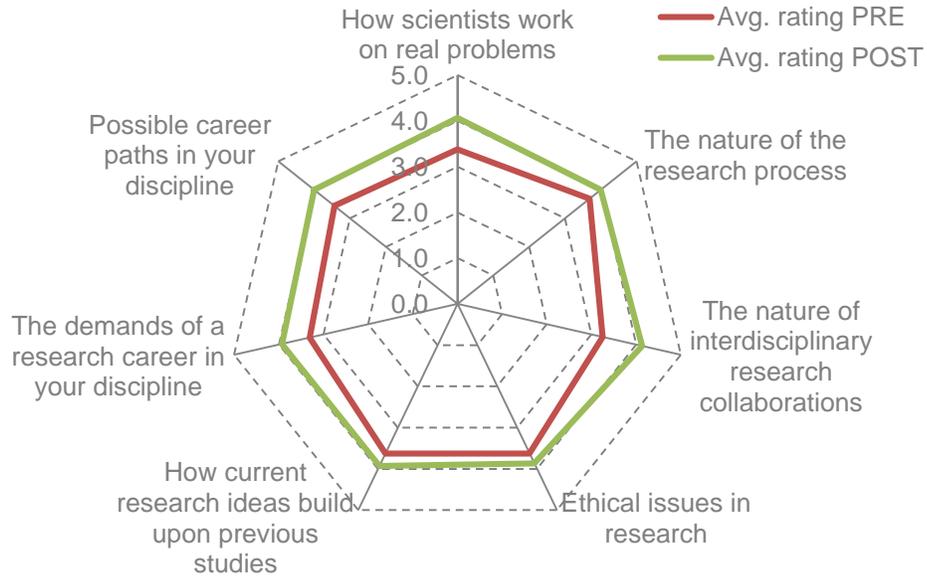
Scale : 1 = Extremely poor at the skill to 5 = Excellent at the skill



**Participant Knowledge**

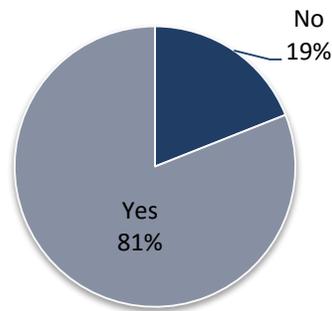
**Figure 12. Participant pre- and post-program knowledge, self-reported**

**Scale: 1 = Extremely poor understanding to 5= Excellent understanding**



**Graduate School Plans**

**Figure 13. Did this research experience impact your plans to go to graduate school?**



**Please explain how the research experience impacted your plans for graduate school:**

*Gaining experience in a research setting provides me with a better preparation for upcoming research in graduate school*

*I had always hoped to apply for a PhD program. However, I did not know what to look at when applying to graduate school and what these schools required during the application process. The graduate panel and talking to Post docs helped me immensely.*

*I may consider an MD/PhD program for the financial benefits*

*I now know that I want to go to graduate school for applied mathematics.*

*I was unsure if I would enjoy graduate school because it seemed to be a continuation of the monotonous schoolwork I'm doing now. After completing this research experience, I am more excited than ever to go to graduate school. The independence I experience this summer is really what I'm looking for and can't wait to find in my further education.*

*It helped me decide that I am less interested in mathematical biology, and more interested in applied mathematics itself.*

*It reinforced my desire to attend graduate school.*

*It showed me that I definitely want to go to graduate school. The graduate school events helped monumentally.*

*Made me much more open to the idea, especially of enrolling in a PhD program, for several reasons. For one, I found that I really enjoyed the research environment, a lot more so than some of the previous experiences I had had in different fields (microbiology, mostly.) This was due to my positive reaction to the environment at NIMBioS (I felt was very open, conducive to academic research), the type of work that we were doing (collaborative math/computer modeling), and the abundance of activities that were pacifically aimed towards informing participants about graduate school. These include the graduate student panel, the receptions with working groups, meetings with mentors and postdocs, etc. I think the ability to meet so many people at so many stages in their careers, and just being able to talk to them was very helpful, actually taught me a couple of things about the process I didn't know, and significantly warmed me up to the idea.*

*My research experience impacted me to apply and attend grad for applied mathematics for the sciences.*

*The opportunity to talk with professors and graduate students in the field/area of my interest gave me a better understand of the route I have to take to continue doing research in that area.*

**Table 1. Participant pre- and post-program degree plans (14 participants answered both pre and post participation)**

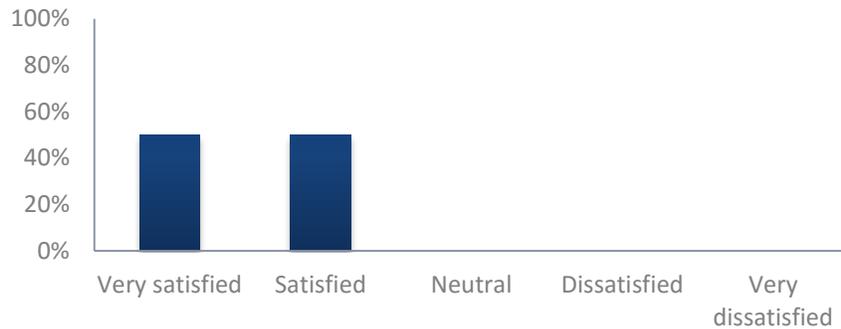
		End of Program			Total
		Bachelor's	Master's	PhD	
Start of program	Bachelor's	0	1	0	1
	Master's	0	0	3	3
	PhD	0	1	9	10
	Total	0	2	12	14

## Mentor Evaluation Survey Data

(n = 8)

### Overall Satisfaction

Figure 14. Overall, how satisfied were you with the NIMBioS SRE program?



### Overall comments about the program:

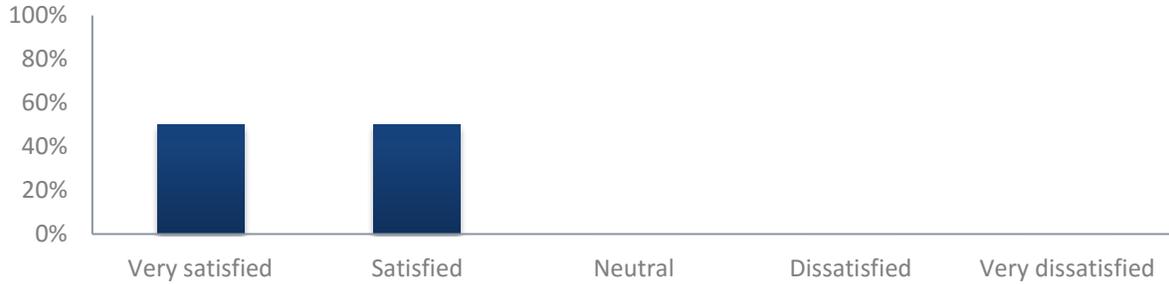
*It would be helpful to know the evaluation criteria on which we are assessing the students at the beginning of the program so that we could keep an eye out for these aspects of their understanding at the beginning vs. the end. We felt disconnected from the requirements that the program had for the students (i.e. report criteria, poster criteria, etc.) and what our goals for the SRE were for the 8 weeks. So, it would be helpful to have a handle on these aspects to integrate them better with our planned schedule and goals.*

*Perhaps have a regular "tea time" at which there would be rotating mentors from different groups guaranteed to be in attendance so the SREs could have a bit more interaction with different mentors, along with resident NIMBioS postdocs and visitors.*

*Training for participating faculty will be key and discussion of methods which work and which do not. I would like to learn from others of which methods work best with students and what should be avoided.*

## Application Process

**Figure 15. How satisfied were you that the student applications supplied the necessary information needed to choose qualified participants?**

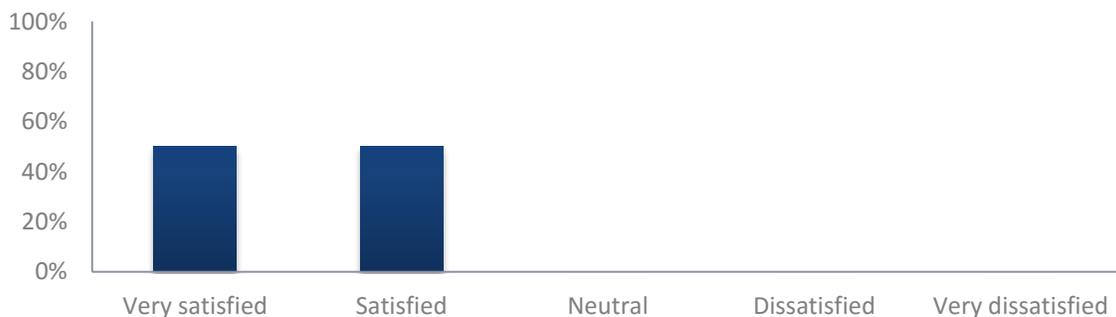


***Please provide any suggestions regarding questions or content that might be helpful to include in future applications:***

*If students had prior research experience, a short paragraph about what the project was about and how math modeling was used in it (and other techniques - statistics, programming) would be useful*

## Student Training and Supports

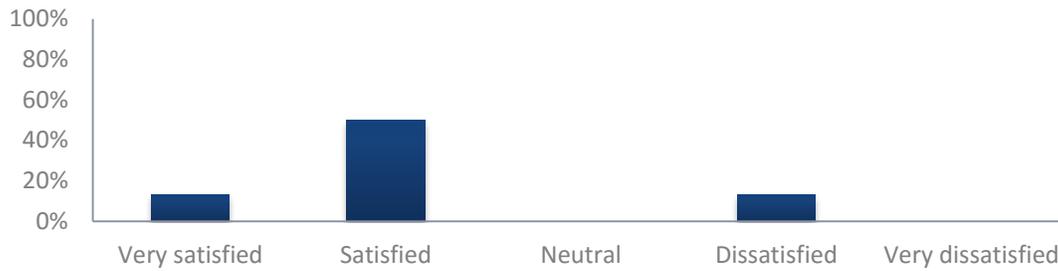
**Figure 16. How satisfied were you with the training provided by NIMBioS to your students (lectures in R, MatLab, modeling, etc.)?**



***Please let us know if there are any additional training that you feel would have benefitted your students:***

*Might be good to have a brief option on "good coding practices" that would apply across whatever language/software tool they use.*

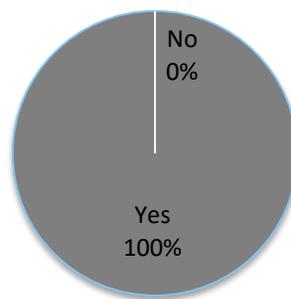
**Figure 17. How satisfied were you with the other supports provided by NIMBioS to your students (computer resources, social activities, etc.)?**



*Please let us know if there are any additional supports that you feel would have benefitted your students:*

*No comments*

**Figure 18. Did your students attend all research group meetings?**

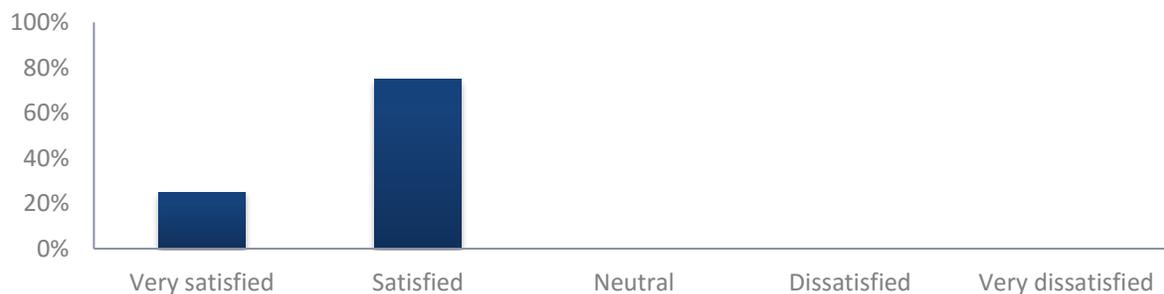


*If you answered "No" above, what were the reasons for not attending provided by your students?*

*N/A*

## Group Communications

**Figure 19. How satisfied were you with communication within the program (among organizers and mentors) about expectations, program schedules, etc.?**

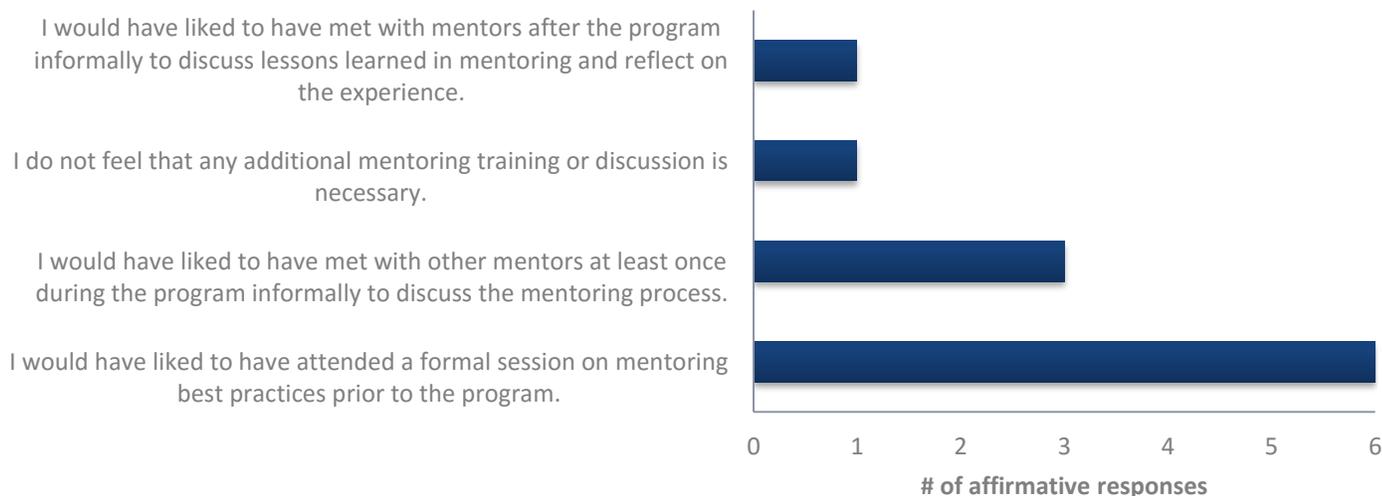


**Comments about communications within the program in general:**

*I am not sure if I completely got the idea about expectations (in terms of scientific expectations).*

**Mentor Training**

**Figure 20. Please indicate if you agree with the following statements:**

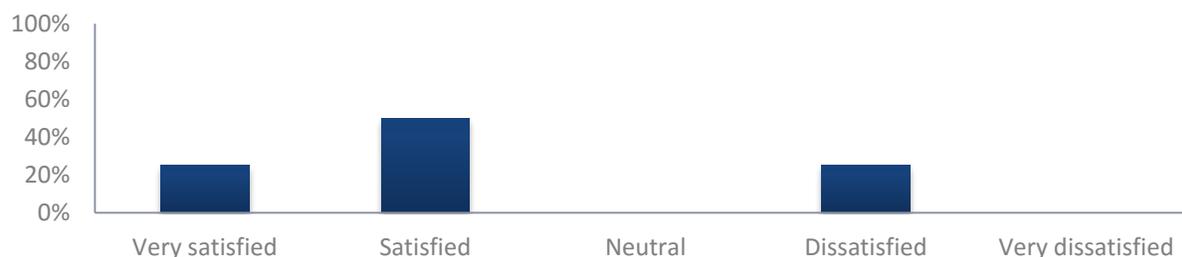


**Comments or suggestions about mentor training:**

*I think the option to have all mentors meet would be beneficial to those with less experience and would clarify expectations across the groups.*

*I think we must have a session on mentioning practices, and review our expectations and goals for the program. I feel that I had too high expectations of what needed to be done and it is possible that a session would "temper" my expectations and prepare me for better work with students.*

**Figure 21. How satisfied were you with your interaction with the other mentor(s) on your project?**



**Comments about interactions with other mentors on your project:**

*I'd have found a meeting of mentors to be useful a few weeks into the program.*