

## REU Exit Focus Group Session

### Summary Report

Summer 2014

Number of participants = 8

The purpose of this focus group has been to collect REU Program participants' feedback on the activities, targeting Program Learning Outcomes achievement for future program iterations. All eight participants attended the focus group session led by the SATAL Program.

- **For each of the program learning outcomes 1-6, which activities A-F have been particularly effective in supporting its achievement? Please elaborate on survey responses for each PLO. What activities have helped you achieve each PLO?**

REU Program has designed activities to help you achieve these outcomes, including ...

- A. Orientation
- B. Computational bootcamp
- C. Professional development workshops on Wednesdays
- D. Feedback Fridays
- E. Group and individual meetings
- F. Research Symposium

#### 1. Formulate well-posed mathematical problems.

Students noted that *Feedback Fridays* and *group and individual meetings* helped with this program learning outcome (8 or 100%). Students reported that, when planning on posing a problem to someone else, they had to think of a way to make the problem easily presentable (7/7 or 100%)\*. Some felt that the *Research Symposium* helped to formulate well-posed mathematical problems (4 or 50%).

#### *Illustrative Comments*

"You have to present the work, so you have to think about how to say it."

"When you have to share, you have to formulate how to explain the problem. You have to sit down and think about how you have to formulate it in an understandable way."

"At the Feedback Fridays, we had to present our work. When you're presenting a project to someone you have to formulate the problem and explain the problem to them and how you're approaching it. Whenever I presented I had to work to make the problems understandable to others even if they haven't been working on it with you. Sometimes when you're doing computational work, you're just sitting in front of a computer all day writing code, but it made you actually think about the problem you're working on and how to describe it to others."

#### 2. Implement computational methods for solving mathematical problems.

*Computational boot camp* allowed students to improve their implementation of computational methods (8 or 100%). They also unanimously agreed that *group and individual meetings* supported the refinement of this skill (8 or 100%). The collaborative aspect of *Feedback Fridays* was helpful as well (8 or 100%). Some students found that the feedback they received and the chance to present during Feedback Fridays helped by providing them with a chance to hear from others who might have a different perspective on a subject (6 or 75%).

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*Illustrative Comments*

“You learn about computational methods in our boot camp, so they taught you how to implement them. It was really dry. You can’t implement computational methods unless you know them, and we were taught computational methods at boot camp.”

“You can get comments and feedback from people and implement it in your research project.”

“Sometimes they gave us ideas at the Feedback Fridays.”

### 3. Use data to inform mathematical models and to analyze numerical results.

Students agreed that *Feedback Friday* and the *group and individual meetings* helped them to use data to inform mathematical models and to analyze numerical results (8 or 100%). Students noted the *Research Symposium* helped with this PLO because they have to completely understand and analyze the work to share it properly (7/7 or 100%). Students reported that the *computational boot camp* helped with this PLO because they learned how to generate and create data, apply findings to existing work, and analyze results (7/7 or 100%).

*Illustrative Comments*

“When you have to discuss your work, you can only do that when you really understand it. We would also discuss things afterwards...We get to learn more for future direction. So analyzing numerical results in front of people makes you remember really well.”

“Sharing ideas with each other helped with the work.”

“Receiving feedback from other people helped to improve upon your work.”

“The computational boot camp was where we reviewed how to use MATLAB and how to look at numerical results. For this one we learn how to use data, how to generate data or take data that we have to solve different problems. From what we learned we were able to apply that to the work that we did. That ultimately helped us to analyze results.”

### 4. Give clear and organized written and verbal explanations of mathematical ideas to their peers and researchers in the field.

All students present agreed that *Feedback Friday*, *group and individual meetings*, and the *Research Symposium* provided them with the opportunity to improve upon their written and verbal explanations of mathematical ideas (7/7 or 100%).

*Illustrative Comments*

Refer to PLO # 3 for comments.

### 5. Recognize ethical and responsible research conduct.

All students present felt that *Orientation*, *group*, and *individual meetings* helped them recognize ethical and responsible research conduct (7/7 or 100%). Some students felt that the *professional development workshops* supported their achievement of this learning outcome (5/7 or 71%).

*Illustrative Comments*

“There was a lecture about this topic, and it reinforced our knowledge.”

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## 6. Collaborate effectively in a group environment.

The students mentioned that each of the six program activities contributed to the development of their collaboration skills. Students agreed that *group and individual meetings*, as well as *Feedback Fridays*, contributed to that skill the most (8 or 100%).

Many students attributed their teamwork development to the *Research Symposium* in which they worked together to make presentations (6 or 75%). One team especially noted their collaborative system when crafting presentations, while the other team utilized a more individual-centric method (4 or 50%). The former constructed their presentation together, interacting with one another directly. The latter group divided the work and put the work together to make a singular presentation. Some students considered their work in *computational bootcamp* as an opportunity to develop their collaboration skills (6 or 75%).

After some discussion differentiating between the two separate *orientation sessions*, most students were in agreement that the smaller, REU-oriented session helped with their collaborative development more than the larger one (6 or 75%). Relatively few students (2 or 25%) felt that the larger, campus-wide session helped.

### *Illustrative Comments*

“The Research Symposium, I think it helped with [collaborating effectively]. We kind of played to our strengths, and we learned how to break it up and process it the most effectively as a group. So you can contribute the most to the group by doing a piece of the work...”

“In our group, we didn't really make the presentations as a group. We sort of contributed--each one of us--and got us results to work.”

“[Students in the REU group] do group activities, and I think that is trying to help us work as a group.”

“We learned to play to our strengths, and try to process it most effectively.”

## • Could you please offer us any advice to make future REU programs a better experience?

As mentioned in the previous focus group session, all participants agreed that a “journal club” where students could read articles and discuss them would be a favorable addition to the research experience (8 or 100%).

The students suggested more focus on developing team dynamics, voicing their need for a set infrastructure for teamwork (8 or 100%) and one-on-one check-ups with the advisor on how they are working together (8 or 100%). From an interdisciplinary standpoint, students would like more social activities with other programs to get to know them better (6 or 75%). Those who did not vote in favor of this were only somewhat supportive of the idea of meeting members of other research groups, one individual stating that they were satisfied with socializing within their own group (2 or 25%).

Students stated that they would have preferred a packet of the background/general information of the research rather than the weeks of in-class review (7 or 88%). Instead of the time they spent reviewing, they would have rather used it to conduct research (8 or 100%). One student valued the lectures more than other students, but would have wanted to cover more in-depth material (1 or 13%). Most students agreed that they were not the target for the professional development workshops and would prefer topics more relevant to them (7 or 88%). The student who found the workshops to be useful noted that the structure and much of the content was tailored solely for UC Merced students (1 or 13%).

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*Illustrative Comments*

"I think I mentioned it before... I think it would be really cool to have a journal club kind of thing. We read articles and kind of talk about them. Our group had a lot of papers to read and went on it on our own. I think it would be really cool to go over it together as a group."

"All of these [PLOs] are working on academic wellness. Maybe have a component that focuses on how you improved socially or as a person. Non-academically, I guess."

"A lot of time is spent on the background, so if they could send a packet of information to get acquainted with, there would be more time to spend on the actual research."

"Give us the lighter background information, but have us learn some of the heavier stuff here. This would give us a few days and that would be really nice."

"Have more activities with the other programs. Not necessarily a workshop environment. I feel like ARCHIMEDES was really clique-y and did their own thing. There could be some sort of effort in terms of organizing and coordinating an opportunity to collaborate with other groups. Like an ice cream social."

"A good thing would've been spending a day discussing good ways to work on coding together. I think an area that we lacked in was being able to effectively code things as a group. We were good at programming things on our own."

- **What advice would you give to future REU Program participants?**

Students vehemently agree that future participants should be patient with the work (8 or 100%), as well as with each other (8 or 100%). If problems arise between two parties, the participants suggest first working together with the other party to fix the issue (8 or 100%). If the issue continues to hinder progress, the students suggest that they approach the group mentor in regards to the problem (8 or 100%).

Given that frustrations with the work will inevitably arise, most of the current members suggest stepping away from the problem and coming back to it later (7 or 88%). The other student's suggestion was "Just do it" (1 or 13%). Differing methods aside, they all agreed that they should not be afraid to ask for help from fellow members of the group (8 or 100%). The students suggested getting to know their peers on an academic level. They found importance in being conscious of one another's level of development for various topics and using that consciousness to benefit the overall collaborative effort (8 or 100%).

Students want future participants to be aware of the program's nature of constructive critique, suggesting that all students be open to feedback and come with an open mind (8 or 100%).

*Illustrative Comments*

"[Be patient] with the work because sometimes it can get difficult. The work can be very difficult. Be willing to work through difficult problems."

"[Be patient] with your group members. You're not always going to agree. [Consider] the fact that you're working together eight hours every day."

"Don't be afraid to ask for help, others have different strengths, get the most out of the experience."

"Be conscious of others' strengths and weaknesses. Don't be afraid to ask for help but also offer help. Don't be patronizing when you're explaining something."

"If you are working fast, slow down and make sure everyone has the same understanding."

"If there are problems, and you can't work it out yourself don't be afraid to talk to your mentor."

"Don't be afraid to step away from the work and take a break, then come back to it. Staring at it all night is not a productive use of your time if you're stuck."

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“With Feedback Fridays, don't think you have to come to a full completing arc with what you're doing for the week. Don't be afraid to talk about things that didn't go well.”

- **Other Comments.**

Within the program activities, the students liked the industry and graduate student panels, as well as the trip to the national lab (8 or 100%). They felt that the *Feedback Fridays* were very useful and should be kept (8 or 100%). They enjoyed sharing ideas with their peers at the Feedback Friday sessions (8 or 100%). They noted that the advisors were a crucial component in making their program experiences what it was, especially valuing the meetings with their advisors (8 or 100%).

They enjoyed living in the same place as the other participants (8 or 100%), and would have also enjoyed living with the other on-campus research programs, if possible (8 or 100%). They found the small size of the program to be optimal and would object to increasing the amount of students per project (8 or 100%).

*Illustrative Comments:*

“Feedback Fridays was an awesome idea. It was a good way to keep track of your work and get a weekly wrap-up and get feedback from people in your group and outside your group.”

“I liked the size of the program. Because it was small, we got to interact with our advisors and amongst our team and other teams. I would suggest keeping the small size. We all got to know each other.”

“I think this size is max. Unless there are more projects, don't add more people.”

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