

Focus Group Summary Report
Applied Mathematics Program
Number of Participants: 11 students
Fall 2014

Goal: The focus of the discussion session was to collect undergraduates' learning experiences in the Applied Mathematics Program, in particular regarding PLO # 1: "Upon graduating, we expect students to be able to solve mathematical problems using analytical methods." Focus group participants were MATH 141 students.

Topics of Interest: Program Learning Outcome #1, sequence of courses, and instructional methods.

Brainstorming Activity

1) Write a brief paragraph about your primary experiences as an Applied Mathematics student. What are the immediate images, concepts, or phrases that come to mind?

When asked to share their experiences as Applied Mathematics students, participants mentioned that the program, though challenging, it can associated with camaraderie and support. Students described their work as difficult to complete on their own (10 or 100%). However, they felt comfortable with asking peers and instructors for help (10 or 100%). Students stated that faculty has been a consistent source of support and that has always taken the time to give students the help they needed (10 or 100%).

Participants also described their experiences in the program as "mind-blowing" (9 or 90%). Also, some participants associated their experiences with computer science and coding (7 or 70%).

Illustrative comments:

"It's a lot...It's hard to do the math without having other people to work with, so it makes you work with people."

"Faculty are always there to help you. They're very helpful. If you have any questions or anything they take their time to explain it to you."

2) Given PLO # 1, how useful have your courses, especially upper division ones, been toward preparing you to model and analyze real-world problems using mathematical tools?

*a new student joined the session, thus raising the total number of students to 11 (N=11).

Most students *somewhat agreed* with the PLO #1 statement (8 or 73%). Participants noted that they are unaware of what "real-world problems" look like, and that they are unsure if they would be capable of analyzing them using mathematical tools (11 or 100%). They noted that they have difficulties remembering the material outside of class, and if they were to come

across a real-world problem, students would require an in-depth review to remind them of the mathematical tools (11 or 100%).

Two students *strongly agreed* with the PLO # 1 statement (2 or 27%).

Participants expressed that they currently analyze real-world problems in their classes, due to the “hands-on” nature of their education (11 or 100%). Many of the participants praised the professors for their “thoroughness” in teaching (9 or 81%). They find that the professors guide them very well in the learning process (9 or 81%).

One student *agreed* with the PLO #1 statement (1 or 9%).

Some participants had difficulties responding to the question because they have yet to take many upper division math classes since they are still new to the program (7 or 64%).

Illustrative comments:

“After we take one of these courses and even after we study a lot, we often forget a lot of this material...I have to reteach myself.”

“...my teachers were very thorough in connecting things to the real world.”

3) At what point (or which project) did you really feel as though you were fully engaged with Applied Mathematics?

Most of the participants stated that their *Linear Analysis* class, which allowed them to work with singular value decomposition, engaged them in the program the most (8 or 73%). A few students noted their *Real Analysis* class as a meaningful math class (3 or 27%). In addition, some of the participants recalled classifying cancer cells in Math 32 as an engaging time for them (3 or 27%).

Illustrative comments:

“When you do Math 21 or Math 22, you’re just doing it because they’re telling you... but it wasn’t until Real Analysis that you understand why you’re doing it and it totally makes sense.”

4) Have there been teaching practices that have been particularly effective at supporting your learning? How so?

Most participants agreed that by randomly calling on students during class, professors keep students focused (10 or 91%). Also, participants noted that solving problems on the board during class time benefited students when completing their assignments at home (7 or 64%). Students mentioned that working in groups is also quite helpful to their learning (7 or 64%).

Illustrative comments:

“...she always called on people so it actually made me pay attention more, rather than get distracted.”

“When they make you go up on the board and write and you do the problem the whole way even if you’re messing up. It’s embarrassing and it sucks a lot of the time, but when you come out of it and you go do homework you really appreciate it later on.”

5) What are the key points that faculty should know?

Participants mentioned that professors in the Applied Math Program value real life application of math problems (7 or 64%). Regarding electives, participants would like some freedom to choose electives, regardless whether those electives count toward their major (6 or 55%). Some of the students wished class requirements for the program were not as strict (7 or 64%).

Illustrative comments:

“Electives kind of get shoved away because they have no impact on your major progression, but they’re also very valuable...”

Acknowledgements:

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