2019 Global Environmental Science Alumni and Graduating Students Focus Group Report

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ABSTRACT
In 2019, six Global Environmental Sciences graduating students and alumni participated in a focus group interview. The focus group intended to investigate students’ perception of the curriculum support structure and the impact of the curriculum on their learning outcomes achievement and skill development. Participants considered the curriculum support structure to be imperative to their undergraduate research and thesis completion. Most participants were highly satisfied with the program and reported high levels of learning achievement, especially in research skill development. Participants also acknowledged the undergraduate chair for his personal and individualized support. They provided helpful suggestions for program improvement.

EXECUTIVE SUMMARY:
Yao Hill, the Assessment Office faculty specialist, conducted a focus group interview with six Global Environmental Science (GES) BS degree graduating students (n = 2) and alumni (n = 4), organized by the GES undergraduate chair Michael Guidry on July 25, 2019. The questions are in Appendix 1. The focus group took place in Marine Sciences Building Room 200 from 6:30-7:30. Michael provided a light dinner at the beginning of the focus group as an incentive for participation. During the focus group, students reflected on their learning experience and the helpfulness of the curriculum support structure for conducting and completing their undergraduate theses. All students gave written consent for the focus group to be used for program reflection and improvement purposes. The consent form is in Appendix 2.

The curriculum support structure includes the following:

- **OCN 100 Global Environmental Science Seminar (1 credit)**: to introduce new GES majors to different research topics and areas, the faculty members on UH Mānoa campus that conduct research, and the facilities (e.g., labs) where research occurs. Students produce and present an infographic on an environmentally-related research topic of interest;

- **OCN 399a. Introduction to Research (1 credit)**: to have students solidify their research plan and build a formal mentor-mentee relationship with a faculty member;

- **OCN 399b. Finishing Strong (1 credit)**: Students receive individualized support on their thesis progress (timelines, deadlines), oral presentation, and next steps in their career path.

- **OCN 490 Communication of Research Results (2 credits)**: to generally improve various aspects of oral communication and also prepare the students for their required GES Symposium oral presentation of thesis research results;
• **OCN 499 Undergraduate Thesis (3-6 credits):** to allow students and faculty mentors to gain credit for conducting faculty-mentored research;

• **Practice Oral Presentation:** a formal event in which students practice their oral presentation and receive written and verbal expert feedback;

• **Thesis Draft Review:** A process that independent reviewers (other than students’ mentor) review students’ drafts and provide feedback for improvement; and

• **GES Student Symposium:** A formal event in which students present their research to the academic community on campus in a professional manner and answer audience questions

**Major findings that emerged from the focus group include:**

1. Participants considered the degree requirements to be rigorous, difficult, and rewarding at the same time. They deemed the curriculum support structure imperative and essential for their thesis completion and building research and presentation skills. They considered the program better prepared them for graduate schools and for applying for jobs in the science field than other degree programs.

2. A typical learning journey of a student is from “having-no-clue-of-what-research-is” when they first entered or transferred into the program to “I-know-I-did-this-once-and-I-can-do-it-again” when they exited the program.

3. Most participants were highly satisfied with the program, but the satisfaction level seemed to hinge on the academic and personal support. As one student concluded, “[t]he person who is involved in facilitating your education is super important. There are some who are definitely better than others.” Participants expressed deep appreciation for Michael Guidry’s timely support for their academic and personal needs, such as job search, housing, and health issues.

4. Participants gained the skills of approaching the research process, conducting research, and working with faculty members to complete research. Alumni commented on how the skills gained helped them to be confident and successful in applying for science positions, function in their current science positions, and meeting the graduate school demand.

5. The majority of the participants considered that they had achieved the exemplary level on five out of seven student learning outcomes (SLOs) at the time of graduation (i.e., SLO 1. Knowledge of basic principles/concepts, SLO 2. Apply the fundamentals of science, SLO 3. Employ the scientific approach, SLO 4. Conduct research, and SLO 5. Information literacy). Even though students’ self-assessment was lower on SLO6. Written communication and SLO7. Oral communication, they considered the program provided better preparation for them in these two areas than other programs.

6. Participants suggested that the program seek ways to (1) better reflect their research and subjective area expertise through transcript notation and concentration notation on the diploma; (2) to increase the opportunities for students to practice talking about science topics with audiences of different opinions; and (3) to consider differentiated support for transfer students and freshmen.

To conclude, the fact that all the invited students are successful graduating students or graduates from the program strengthened students’ perception that the curriculum structure support for thesis completion is imperative.
DETAILED FINDINGS

Question 1: The GES program attempts to build students’ undergraduate research skills. Describe your current understanding of what research involves.

The major concept emerged is the realization that the research finding is not finite and that the knowledge body will change.

- “It’s important to understand whatever you complete is not finite. It can change later on.”
- “There are a lot of uncertainties too. Even though it’s credible, there are always two different sides. Never really accurate.”
- “How new research has either solidified what was previously known or completely changed ideas on what we know.”
- “Knowing when the sources are generated, how it changed, following the path pretty much.”

An equally important theme is the realization that research is hard work and a rigorous process filled with the unexpected:

- “You think that you know something but (realized) that you actually don’t know anything. Everything goes wrong. All the time.”
- “You can’t BS your work.”
- “It is a lot of work”
- “It's a really rigorous process. It's not something that can be done in a short time scale. It takes months to years to decades to answer some of these questions. Even then some of them (questions) aren't really answered.”

The surprising major theme emerged is the concept of “credibility”, the credibility of both one's own claim and the sources used.

- “You can’t say anything without it being backed up and you need to make sure that the sources that you are citing are legitimate and credible.”
- “A lot of it involves understanding and appreciating the credibility behind how the scientific world establishes what we know as knowledge”
- “It’s all about credibility.”

A unique perspective emerged is that “research should be fueled by curiosity,” with the implication that research is such hard work, without curiosity and passion, it is very challenging to go through the process.
Question 2: Look at the GES’ support activities in the curriculum (Table 1). How has each of them helped you with your undergraduate research experience and skill development?

Students were asked to write down one idea on a sticky note and post it under each curriculum support component (see example in Figure 1).

Students’ actual comments were listed in Appendix 3 and summarized in Table 1 below:

![Figure 1. Students’ input on how OCN 100 helped them using sticky notes.](image)

<table>
<thead>
<tr>
<th>Course</th>
<th>How did it help? (Number of Comments in Parentheses)</th>
</tr>
</thead>
</table>
| OCN 100 (7 comments) | • Allowed students to explore research topics on campus (4)  
  • Meeting faculty members who could serve as thesis mentor (2)  
  “Encouraged researching faculty on campus that could serve as thesis mentor, this familiarized us with faces and potential projects.”  
  • Learn about other Environmental Science field of study (1) |
| OCN 399 (4 comments) | • Exploring research interests and potential research projects with potential mentors (3)  
  “Encouraging to get yourself out and communicate research interests with potential mentors.”  
  • Build a GES student research community (1) |
| OCN 490 (7 comments) | • Provided opportunities to practice presentations (2)  
  • Gained confidence in presentations (2)  
  • Helpful resources (1)  
  • Guest speakers with different insights on career avenues (1)  
  • Didn’t get much out of the class (1) |
| OCN 499 (7 comments) | • Gained real research experience while earning academic credits (2)  
  “Best part of GES. Allows you to conduct real research & gain experience for academic credit.”  
  • Gained understanding of the research process and research skills (2)  
  • Helpful to have a flexible mentor who can meet off-campus (1)  
  • Opportunity to work closely with one faculty member (1) |
### Course | How did it help? (Number of Comments in Parentheses)
--- | ---
Practice Presentation (3 comments) | • Imperative to completing a thesis (1)
• “Definitely necessary” and “super helpful” (2)
  “Super helpful at forcing me to gather thoughts & make presentation more streamlined.”
  “Definitely necessary as this is many of the students' first time giving talks.”
• Hard to fit in schedule (1)
Thesis Draft review (3 comments) | • Make the thesis better (1)
• “Critical” practice of actual publication process (1)
• Receive validation on one’s work (1)
GES Symposium (8 comments) | • Good practice for students to present in a professional setting (3)
• A positive experience (“rewarding” and “cool”) (2)
• Showcase one’s work (1)
• Learn about others’ research (1)
• Stressful (1)

**Question 3: What role did this curriculum support structure play in your undergraduate research completion, oral presentation, and written communication skill-building?**

The large majority of the participants felt that the structure is imperative to their thesis completion and the entire program is designed to enable students to successfully complete a thesis project. The program also prepares students for graduate school.

- “You are more prepared to do grad school than students in other degrees”
- “I was able to appreciate how much work and structure is set up to prepare us.”

Another key theme emerged is the support from the Michael Guidry. Participants considered him to be super supportive: “He knew what you needed at that moment and he was willing to support you. He’s totally fine with meeting you where you are at;” “He understands that life happens;” “If we come to him with any kind of struggle like that whether it’s financial or food, or housing. He’s totally supportive and help us.” Two participants mentioned that Michael helped them find an on-campus academic-related job on the spot or in one day. Another participant gave an example that Michael once dropped everything and took her to the hospital due to a medical emergency and continue to check-in with her every six months.

Students provided comments on specific components of the curriculum structure

OCN 100 provided opportunities for students to explore research topics and meet with faculty:

- “I think when you are in the moment taking the classes you don’t really realize it. When looking back, you wish that you appreciated how necessary and..."
helpful that 100 was gonna be for you. Certain key things didn't click for me till the very end like that's why [the previous undergraduate chair] had us research faculty our first semester here. The idea of the thesis was so far from my head the first semester. (Another participant: You don't know what it means.) You don't know what it is.”

• “The school that I went to never mentioned the word research. I never heard anything like this like as an undergraduate. You make a project of your own and complete it. Coming from that background, having the structure really helped me succeed in the program. Everything from 100, learning from different faculty members and getting encouraged to go and talk to them and see what they are doing, not even doing a project yet. Just breaking that barrier that seems to be between the social classes within an academic department.”

OCN 490 provided opportunities to practice oral presentations

• “I think that 490 was also a big help in terms of building OC skills, answering questions on the spot. Not necessarily science topics.”

OCN 499 allowed time and flexibility to do research and maintain full-time student status (2)

Draft Review Process

• “All of the classes that I remember taking steer you toward completion, even with the draft review.”

Practice Presentation was an essential preparation

• “I think that the practice presentation was so essential. If I wasn't able to practice before I went up, I would probably lose my mind. (Another participant: I practiced a couple of times too.) Yeah, so, if I didn't have that, I don't know how it would have gone.”

• “I remember that I took Geology 200 in my semester... there were some presentations at the end and I was like I have been doing this for a few years in terms of presentations 'cause this is how the program was built. And I remember that the instructor had comments on that after everyone presented I was the most confident of all the students because none of them had that practice.”

Symposium offers a sense of completion and a huge sense of accomplishment (2)

• “So the program itself offers that. It kind of helps. It has an ending. You have a symposium. You can feel the completion.”

• “Yeah, I think that's really the cool thing about the symposium. You know that you are done when you get up there and you present and when you done, you are really done. It's a huge sense of accomplishment when you finish. (Another student: Oh my gosh.)”
Question 4 (a) At the time of graduation from GES, how well have you achieved the following learning outcomes (handout). For each SLO, put a dot on the chart that represented your achievement level.

The facilitator gave students dots that allowed them to place themselves on the SLO evaluation chart (See Figure 2.). The results were summarized in Table 2 below. All students rated themselves exemplary at achieving SLO 1. Basic principles/concepts and SLO2. Apply the fundamentals of science. Large majority considered themselves exemplary in SLO 3. Employ scientific approach, SLO 4. Conduct research, and SLO 5. Information literacy. Students had lower ratings on SLO 6. Written communication (1 approaching, 3 proficient, and 2 exemplary) and on SLO 7. Oral communication (2 approaching, 3 proficient, and 1 exemplary).

Table 2. Student self-evaluation of program-level student learning outcomes achievement summary

<table>
<thead>
<tr>
<th>Program Student Learning Outcome (Abbreviated)</th>
<th>Emerging</th>
<th>Approaching</th>
<th>Proficient</th>
<th>Exemplary</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Basic principles/concepts</td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>2. Apply the fundamentals of science</td>
<td></td>
<td></td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>3. Employ the scientific approach</td>
<td></td>
<td>2</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>4. Conduct research</td>
<td></td>
<td>1</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>5. Information literacy</td>
<td></td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6. Written communication</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7. Oral presentation</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
Question 5: What are you doing now professionally? What were the most valuable and useful skills that you obtained from your GES-required research experience that helped you in your post-GES job and/or graduate studies?

Student status:
- 2 graduating students, with one starting a graduate school
- 2 graduate students
- 1 working in a science lab
- 1 graduated from B.S. and is looking into a graduate school now

The most valuable experience reported by students is going through a research process from start to finish, and the constellation of the skills that came along with it: employing the scientific approach, how to approach research topics, designing and conducting research, doing experiments, conducting analyses, writing and presenting one’s research, and going through review and revision process.
- “I think that the most viable skills with respect to the SLOs would be No. 3 [Employ the scientific approach] and 4 [Conduct research]. Specifically, I feel very comfortable planning out a graduat-level project to do in the future. I feel comfortable planning it out from start to finish, and then I was able to do it at sufficient level.”
- “I believe conducting research and pulling things together would definitely be most relevant.”
- “the GES curriculum allowed me to apply the same skills of, principles, and concepts: how to approach the topic, and to read more about it and what questions to ask, so the the GES curriculum provided me with a structure of how I go about learning about different topics. Just like the process overall.”
- “I mean really just the whole process of doing the thesis was the best thing that I got out of the program. It does take you from the start to finish like how the research in the real world is conducted, even pass doing the experiment and doing the analysis and even writing the manuscript and going through an easier review process than the real world, but granted that you still have to go through that review process and deal with comments and things. My thesis is what got me to where I am right now. If I didn't do that or that component wasn't part of the program, I wouldn't be where I am now.”
- “I think before I started and finished my thesis, I wouldn't think that I was able to do it. From the start to finish knowing that I did something and I completed it, I think that accomplishment validates it for me that I can do this kind of stuff and I can do research. Now my grad studies. I know I did this once and I can do it again. It's not different. The whole program itself was really helpful. (Yao. It increased your confidence.) Yeah. for sure.”
- “With all that research done at my belt, I feel that I am confident in going to seek out a PI to work for grad school or someone to work with in all these different areas. I feel that my options are open rather than only have one route to look out, like I can only work on oceanography or I can only work on geology as I move forward looking into grad school.”
One student also mentioned the valuable experience in learning how to code [computer coding] in different languages.

Question 6: Overall how satisfied are you with the support from the GES program for your undergraduate research experience?

The facilitator asked the participants to rate their satisfaction from 0 to 5 with their hand (fist = 0, 1 finger = 1, and so on). Four students rated their satisfaction at level 5, one at level 4, and one at level 2. The students who rated 4 and 5 had Michael Guidry as their advisor and the student who gave it a 2 had Michael’s predecessor as an advisor. Once again this pointed to the importance of the “person facilitating your educational experience.” It also indicates the importance to support students with critical life challenges such as finding a job on campus in the science field and helping students with life and health emergencies.

Question 7: What are your suggestions to the GES program for how to improve and strengthen their support for students related to their research experience?

The major change students would like to see is for their specialization and thesis experience to be officially recognized: that their specialization can be reflected on their diploma as concentration and that their undergraduate research experience can be reflected on the transcripts. Students reported having difficulty applying for graduate school in physical oceanography and jobs in earth sciences because people do not understand what global environmental science is. Students felt that the degree course requirements and required thesis experience make the program so rigorous and yet, it is hard for them to communicate the value of the degree and their expertise to graduate schools and potential employers.

Several participants also mentioned the need to learn how to talk to people with different opinions on science topics. For example, a student said that once a person said to her, “What? You believe in climate change?” She wondered how to respond in such and other similar encounters. One student said that in OCN 490 the instructors had students practice an elevator speech for two days, but she needed to practice it “20 times in 20 different scenarios”. Another student recommended taking a political science course or collaborate with political science faculty to learn how to talk about science topics with different audiences.

The third theme emerged is the differentiated support for the transfer students. A couple of students felt that they were left behind when they first transferred to the program because they didn’t have a faculty mentor. One student felt desperate to find a mentor immediately. On the other hand, because transfer students had more academic experiences, they felt that they did not need to take all of the required courses. They hope the program would remind them of the option to opt-out some of the required courses geared toward life-skill building.
Appendix 1. Focus Group Questions with Notes (by Michael Guidry and Yao Hill)

Question 1: The GES program attempts to build students’ undergraduate research skills. Describe your current understanding of what research involves.

Question 2: Look at the GES’ support activities in the curriculum (Table 1). How has each of them helped you with your undergraduate research experience and skill development?

For example:
- finding a research project and mentor;
- completing your faculty-mentored research project;
- writing your thesis; and
- giving the required oral presentation at the GES Symposium?

In 10 minutes, write down as many thoughts on as many courses as possible. Write one idea per post-it.

[Read each other’s notes for 3 min]

Table 1. Undergraduate Research Curricular Support

<table>
<thead>
<tr>
<th>Course/Event</th>
<th>Instructor/Expert Participant</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>OCN 100 Global Environmental Science Seminar (1)</td>
<td>Jane Schoonmaker Michael Guidry</td>
<td>Seminar to introduce new GES majors to the research interests of GES faculty and the research facilities available within SOEST. Restricted to GES majors. CR/NC only.</td>
</tr>
<tr>
<td>OCN 399a Introduction to Research (1)</td>
<td>Michael Cooney</td>
<td>Guidance finding a topic and mentor for your required GES thesis.</td>
</tr>
<tr>
<td>OCN 399b Finishing Strong (1)</td>
<td>Michael Guidry</td>
<td>Weekly meetings with students in their last semester to facilitate their meeting of the thesis/oral presentation timelines and their post-undergraduate direction</td>
</tr>
<tr>
<td>OCN 490 Communication of Research Results (2)</td>
<td>Margaret McManus Brian Glazer Glenn Carter</td>
<td>Lecture/discussion to provide instruction and experience in oral and written presentation of scientific results and material. Registration limited to GES majors in their final semester. A-F only. Pre: consent.</td>
</tr>
<tr>
<td>OCN 499 Undergraduate Thesis (3-6)</td>
<td>Your faculty mentor for your thesis research</td>
<td>Directed research in which the student carries out a scientific project of small to moderate scope with one or more chosen advisors. The student must</td>
</tr>
</tbody>
</table>
complete a document in the style of a scientific journal article. Repeatable one time or up to six credits.

<table>
<thead>
<tr>
<th>Practice Presentation</th>
<th>2 external expert reviewers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two external reviewers give feedback to a practice presentation given by student. Practice presentation occurs 1-2 weeks prior to the GES Symposium.</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Thesis Draft Review and Feedback</th>
<th>1 external expert reviewer</th>
</tr>
</thead>
<tbody>
<tr>
<td>One external reviewer reads the student’s draft thesis and provide comments in a face-to-face meeting.</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>GES Symposium</th>
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</thead>
<tbody>
<tr>
<td>Students give oral presentation of their research results at the end of the semester to the department.</td>
</tr>
</tbody>
</table>

Question 3: What role did this curriculum support structure play in your undergraduate research completion, oral presentation, and written communication skill-building?

Question 4 (a) At the time of graduation from GES, how well have you achieved the following learning outcomes (handout). For each SLO, put a dot on the chart that represented your achievement level.

SLO 1. Basic Principles and Concepts: Define and explain the basic principles and concepts of chemistry, physics, biology, calculus, geology, geophysics, meteorology, and oceanography.

SLO 2. Apply Fundamentals of Science and Mathematics: Apply their understanding of the fundamentals of science and mathematics to the description and quantification of the interactions of the atmosphere, hydrosphere, lithosphere, and biosphere, including humans.

SLO 3. Employ the Scientific Approach: Employ the scientific approach to problem solving, and hypothesis formation and testing.

SLO 4. Conduct Research: Conduct scientific research, and analyze and evaluate results.

SLO 5. Information Literacy: Demonstrate information literacy by collection and evaluation of scientific literature.

SLO 6. Written Communication: Express themselves clearly and concisely in written form.

SLO 7. Oral Presentation: Demonstrate skilled delivery of well organized informal and formal oral presentation

Question 4 (b) Regarding the SLOs, what have been your greatest achievement? Describe what you have learned. What learning experience in the program has been most helpful for you to achieve that outcome?
Question 5: What are you doing now professionally? What were the most valuable and useful skills that you obtained from your GES-required research experience that helped you in your post-GES job and/or graduate studies?

Question 6: Overall how satisfied are you with the support from the GES program for your undergraduate research experience?

Question 7: What are your suggestions to the GES program for how to improve and strengthen their support for students related to their research experience?

Appendix 2. Consent to Participate in GES Alumni Focus Group Meeting
Dr. Michael Guidry and Dr. Yao Hill are investigating the effect of the Global Environmental Science undergraduate program on students’ skill development in undergraduate research.

We are going to ask you a few questions and record your responses. We will store the recordings in an encrypted folder on a password protected computer. We will permanently erase the recording once we complete our report. In our report, we will not link your response to any personal identifiable information. Your responses are completely confidential. We only want to know about students in general, not about your personal responses. Your responses will be aggregated with other student responses.

If you agree to participate, you will answer our questions in 45 minutes to 1 hour. You will be one out of 6 people participating in this study.

The study does not provide you with any personal benefit but it will provide valuable information for the program to continue to do what works and modify what doesn’t.

We believe there is little or no risk to you in participating in this project. There is a possibility you may become uncomfortable or stressed by answering some of the questions. If that happens, you can skip answering the question. You may also withdraw from the project altogether. There will be no negative consequence to you.

We will keep all information from the focus group in a safe place. Only our research assistants and us will have access to the information.

By signing this consent form, you affirm that you have read the information on this page and that you agree to participate in the focus group and be recorded, and that you are age 18 years or older.

Consent to Participate in GES Alumni Focus Group Meeting

_____________________
Signature

_____________________
Date
Appendix 3. Student comments on how the curriculum component impacted their research experience and skills development

OCN 100
- Global Environmental Science Seminar
- Exploring research opportunities available at UHM that may be of interest for the GES Thesis
- Encouraged researching faculty on campus that could serve as thesis mentor, this familiarized us with faces and potential projects
- Transfer student not required
- A great way to meet new faculty and other students starting out in program
- Brings students up to speed on what research goes on in the department and how students can get involved. Especially of help as a student from the outer islands.
- Learn about other Environmental Science field of study
- Exposure to a variety of related topics

OCN 399a.
- Introduction to Research (Cooney)
- Exploring available research projects
- Exploring research interests with guest students/speakers
- Building a GES community focused around research by sharing thoughts and experiences
- encouraging to get yourself out and communicate research interests with potential mentors

OCN 399b.
[No entry mostly because students communicate with Michael closely at individual bases without realizing that it is a formal course]

OCN 490
- Communication of Research Results (McManus/Glazer/Carter)
- Did not get much out of this class
- McManus brought in guest speakers, all with different backgrounds, all with insight on different career avenues
- Created a friendly atmosphere which allowed me to relax and gain confidence in presentations
- PDF Resources helped construct presentations. Still continue to use.
- Practicing oral communication
- Gaining confidence in communicating
- Practicing presentations to audiences who are at the same level as you

OCN 499
- Undergraduate Thesis (Faculty Mentor)
• Best part of GES. Allows you to conduct real research & gain experience for academic credit
• Toonen was extremely flexible when it came to meetings to review thesis work, often meeting off campus like at Starbucks or HIMB. It's important to have PI that can work with schedule
• Allowed me to work on a research project while counting as credits. Lead to a more relaxed semester of classes, and more focus on project.
• Gained understanding of developing, and completing, a research project.
• To gain skills relative (sic) to research
• Opportunity to work close with one faculty member
• Imperative to completing thesis

Practice Presentation
• Super helpful at forcing me to gather thoughts & make presentation more streamlined
• Very hard to fit time in schedule when taking 12+ units
• Definitely necessary as this is many of the students' first time giving talks

Thesis Draft Review
• Found code errors that changed results, bettering the thesis or research results
• Critical as it mimics actual publication process on a less extensive scale
• Was a great way to receive validation on the work you've done

GES Symposium
• Also critical as it mimics conferences that researchers present their work at
• I cried at the end, holy moly that was stressful
• Good practice for those wishing to pursue Masters or PhDs
• Showcases all the work you've done
• Opportunity to learn about others' research
• Cool to go to every year
• A rewarding experience
• Opportunity to experience presentation in a professional setting