SASC APPLICATION (FALL 2019) RESPONSES

COLTON GRAINGER

0. Explain the parameters of your interest in SASC, e.g. interested in working for SASC now, in future, in certain circumstances, etc.

I could work for SASC for 2 consecutive semesters during Fall 2019, Spring 2020, or Fall 2020. (I plan to comp Spring 2021, and then plan to take a reduced teaching assignment.)

1. Why are you interested in working for the Student Academic Success Center?

I aim to work for SASC in support of a broad effort to "dissect and disarm mechanisms that lead to inequalities in mathematical fields" [Ta19].

I came to know about SASC from three graduate students in the mathematics department. In particular, Sarah Salmon encouraged me to apply to SASC last Fall, while Caroline Matson discussed her curriculum design with me and arranged for me to observe a Calc 2 coseminar.

2. How do you believe that your current skills will contribute to the accomplishment of SASC's goals and mission?

My contribution to the accomplishment of SASC's goals would be to serve as a graduate student teaching assistant, where my mathematical praxis is informed by:

1. Service work.

   Fall 2016 to Spring 2017, following my bachelor's degree at the College of Idaho, I interned in the case management department of a refugee resettlement agency in Houston, TX. Then, Fall 2017 to Spring 2018, while applying to graduate schools, I worked at a shelter for families experiencing homelessness in Olympia, WA.

2. Preparation and reflection.

   Before and after my classes, whether I am an instructor or a learner, I consider four types of questions (as adapted from [Ha13] and [NRC]). These are:

   (i) Knowledge-centered, i.e., What do I want students to be able to accomplish? Why?
   (ii) Learner-centered, i.e., How can I help students build upon and refine their prior knowledge?
   (iii) Assessment-centered, i.e., How can I frequently reveal the progress students have made?
   (iv) Community-centered, i.e., How do I capitalize on the community of learners and society at large?

3. Desire for positive student outcomes in the calculus sequence.

   I am gladly a member of a community[1] at CU Boulder tasked to facilitate high-enrollment lower-division mathematics courses. Now, because calculus is seen to be "the bedrock of students' post-secondary preparation" [BMR15] for science and engineering, I am especially concerned with the success of students through the calculus sequence. Hence, as a graduate student, I believe I have a

Date: 2019-04-28.
url: `https://github.com/coltongrainger/fy19ta/`.

[1]Namely, the community of graduate students and faculty with teaching assignments in the mathematics department, but also broadly, as in Tod Wayman's *Did I Miss Anything?*, (1993).

comparative advantage to support equity in the (future) scientific community by focusing on equity in calculus.

In my praxis, equity is measured in terms of the success of individuals in a group. This perspective is due to my interactions with supervisors (Shaoli Bhadra in Houston) and educators (Dave Rosoff at the College of Idaho) for whom an individual client's or student's success[2] was the *only* goal of their work. Naturally then, as I take on more responsibility for students, I look to emulate Shaoli and Dave, and I recall that I am *only*[3] doing my job when individuals have efficacy to achieve their own success.

3. How do you provide students with feedback regarding their learning?

I attempt to provide feedback to deliver praise and to make constructive criticism in many different scales and modes. Canonically, I am best at giving oral feedback, sketching counter examples on the chalk board, and at providing worked typed solutions to multiple choice quizzes (see for example `https://github.com/coltongrainger/fy19ta`). I enjoying maintaining a website with supplementary materials (see for example `https://quamash.net/math1300`) related to the course.

Here's the laundry list.

3.1. **Formative feedback.**

- Written feedback for technical mistakes/achievements. (By writing comments inline with the math or code.)
- Oral feedback for conceptual mistakes/achievements. (By asking leading questions. By keeping an open mind when trying to determine what prior knowledge might have lead to the conclusion.)
- Group feedback. (If possible, by encouraging students to give feedback to each other, then moderating.)
- Visual feedback. Give a counter example at the board. Plot it in SAGE. Embed the plot as a QR code.
- Statistical feedback. (By uploading solutions to quizzes along with distributions of student scores to a pass-word protected Dropbox).
- Immediate feedback! (Via multiple choice questions, with a link to the solutions embedded as a QR code.)
- WebWork! (Another variant of immediate feedback. hich is the lovely, open-source twin of webassign)
- Occasional email reminders.
- Long term feedback. Typed solutions to exercises.
- Spaced feedback. (By recalling tricky concepts over spaced intervals.)
- I haven't yet made a class Twitter, but that would be *awesome!*

3.2. **Summative feedback.**

- Reflections.
- Big picture discussions.
- Proofs of hard theorems at the end of the semester.
- Being available in person at regular, predictable times. (That is, by demonstrating a willingness to give feedback about any questions whatsoever. By being straight forward about not knowing the answer to a particular question. By being well connected to quickly locate a good answer or a resource to push the student in the right direction.)

[2]I recognize that, in both social work and education, what an individual's "success" actually looks like may be unpredictable. However, there are concrete lower bounds to be met in terms of health, personal safety, access to resources, etc.

[3]There's a bit to be said about self-care here, but it can be quickly summarized as: "Colton, take care of yourself, too!"

4. Scenario: A student in your class has missed several class sessions and tells you that they're juggling a full-time job at the moment. What advice/plan would you discuss with them?

Triage! (The remaining advice/plan would necessarily vary. My *goal* would be encourage them to sanely prioritize, use active listening, then repeat back what I heard as their priorities. I would then set a calendar reminder for myself to follow up the next class, and the next week if necessary. I *would ask for help* if I knew I was in over my head.)

5. Availability

I am available Mondays from 3–4pm and Thursdays from 3–4pm for department meetings.

6. References

[BMR15] *Insights and Recommendations from the MAA National Study of College Calculus*, D. Bressoud, V. Mesa, C. Rasmussen. (2015)

[Ha13] *Statement on Teaching and Learning*, P. Hand. (2013)

[NRC] *How People Learn*, National Research Council. (2000)

[Ta19] *Statement of Commitment to Equity in Mathematics*, H. Tanaka. (2019)