

Faculty Development Plan

NAME

BYU Math Department

Teaching

Self-assessment:

President Worthen summed up the aims of a BYU education as they apply to teaching in two words: inspiring learning. This is my ideal. As a teacher, I try to inspire learning in two ways, namely, I share my passion about mathematics with my students and I try to be an example of one who learns by study and also by faith.

I came to BYU with several years of experience teaching at previous institutions. My experience teaching consists mostly of calculus classes, but also several undergraduate and precollege classes. Since beginning at BYU, I have expanded my experience to several graduate classes and to mentored research with undergraduate students.

My greatest strengths with regard to teaching are the care I show for my students, a deep knowledge of mathematics, and good teaching strategies. I genuinely care for each of my students, and I try to show it. I learn each of their names (insofar as this is possible), and follow up with them when they are struggling. I make myself available for student consultation in my office hours and otherwise, and I encourage my students to come to my office hours. I come to class early and prepared and I always try to involve my students actively in learning during class time.

I really enjoy teaching, and I think my students can feel my enthusiasm for my subject as I teach them. Because most learning does not happen during lecture, I also spend some time every day trying to motivate my students, and to motivate the material they are expected to learn.

Since coming to BYU, I have a record of high quality teaching. My student evaluations have been exceptionally high---every semester being above and disjoint from the average ranges for the department. I have received a teaching award from the Phi Eta Sigma honor society on campus for Faculty Excellence in Teaching.

Since coming to BYU, I have also already done several things to further improve my teaching. Each course I teach, I give a midcourse evaluation so that my students can provide feedback on ways that I can improve each course. After each class period, I take some time to write down a few notes about any things that did not go well, or things that I would like to change for next time I teach that topic. At the end of each semester, I reflect on each course that I have taught, and I write a summary of the good points of each course, and a few things that I would like to change next time. I have also been in close contact with my teaching consultant in the Center for Teaching and Learning, and I have tried several new strategies in my classroom with some good success.

Finally, I have begun mentoring graduate student, and two undergraduate students.

Goals:

Although I have very good student ratings, I want to continue to improve my teaching. These goals I have written below will outline some of the ways that I plan to improve my teaching.

1. In every course I teach, I will use writing of some form. I believe that writing well is one of the most important skills that my students can learn.
2. I will obtain a peer review from one of my colleagues in each course I teach, soliciting feedback on things that I can improve.
3. Each year I will read a book about teaching, to get ideas from experts of additional teaching strategies that might be more effective for my students.
4. Each course I teach, I will experiment with one new change that I have designed to improve student learning.

Scholarship

Self-assessment:

In the Math department, there are two separate standards for evaluating research, namely quantity and quality. Regarding quantity, since starting at BYU, I have submitted three articles for publication. On two of these, I did most of the work since I arrived at BYU. In total, I have ten publications, which is considered solid for a mathematician at this stage of my career.

The quality of my publications is good or very good. Three of the publications appeared in Tier 1 journals and most of the rest appeared in Tier 2 journals.

I have already formed a program of research around early success of the work I did in my PhD dissertation, and another project that I worked on while I was a student. These two successes have opened up a research avenue that I anticipate will carry me through at least five years of research.

Another aspect of quality of scholarship concerns recognition of my research. One way to measure this aspect is by giving presentations on my research. This year, I was invited to speak at a conference, and my Master's student will be speaking at a conference in Italy about our joint work. Although this amount of speaking is also good, I would like to increase the number of speaking opportunities I have.

Among the three areas of teaching, scholarship and citizenship, I think scholarship is the area, where I need to focus most of my effort. Part of the difficulty is that scholarship does not have the same kind of deadlines as teaching and service do, so it is easy to push it to the side, while other things clamor for my time. Furthermore, writing is difficult, and the rewards for submitting a well-written article are very slow coming.

One area where I feel a special need to focus, is applying for external funding. I have had no training in grant writing and have only had one opportunity to write one grant proposal so far.

Goals:

As mentioned, I will focus much of my effort on improving myself on the area of scholarship. I have set the following goals for myself.

1. I will prepare a research agenda with monthly goals. Each month I will define a product that I will deliver by the end of the month. For example, one month I will submit a paper to a journal for publication; whereas the next month my goal will be to have the introduction for my Grant proposal finished, etc. These monthly goals are minor goals that will advance the major goals of my research agenda. I will also bring samples of my writing each week to my writing group.
2. I will schedule at least one hour of every workday to my research agenda, and I will not allow myself to be distracted from the scheduled time. During my research time, I will allow myself only to work on tasks that further my research agenda. In the summer, I will schedule at least three hours every day for scholarship, and during the Fall and Winter semesters, I will schedule one hour each day.
3. I will have two papers prepared for submission each year. I have the following projects lined up.
 - a. An article on Borcea—Voisin mirror symmetry for Landau—Ginzburg models. This article is nearly finished.
 - b. An article on K3 surfaces with automorphisms of order 4 and mirror symmetry. I hope to have a working draft by the end of the summer.
 - c. An article describing the uniqueness of certain K3 surfaces with an automorphism of order 4.
 - d. An article using Matrix Factorizations to probe for phantoms on the Beauville surface. I have just begun this project. I expect to have it finished by summer of next year.
 - e. An article characterizing the elliptic singularities within FJRW theory.
4. I will submit a grant for external funding each year. In October this year, I will apply for a subject grant from the NSF, and the next year I will apply for the NSF Career Award.
5. I will go to two conferences each year, to meet or renew contact with at least two people at each conference, and I will speak at every opportunity I can find. In this way I will improve my network of collaborators, and increase the number of invitations I receive to give. I will plan to give at least two talks each year.
6. Finally, in order to remain current in the advances in my field of research, I will spend at least two hours each week reading articles that have recently appeared by others in my field.

Service

Self-assessment:

When I started at BYU, I was given some rather large service assignments. The first assignment is to serve as a recruitment specialist, with responsibilities including Math Outreach programs, and recruiting certain high school students to come to BYU and major in math. My other assignment was to serve on the calculus committee. I have since been promoted to be the Course Coordinator for Math 113.

Furthermore, I am serving on two PhD committees and am the chair of one Master's degree committee.

I have also performed service to the community in general and to the greater mathematical community. With Tyler Jarvis, I have organized a conference to take place next summer for young mathematicians in my field. I have refereed three articles, and I have taught Math Circles two times.

Although I certainly made mistakes, I have fulfilled my assignments well. I have made plans to improve my performance in the coming years as well. However, one danger that I can see is that committee assignments will take too much of my time, because I am dependable, I try hard to fulfill all of my assignments well, and I am excited about helping my department, the university, and our students.

Goals:

My goals for service I have listed four goals. The first three pertain to service to the department and the university. The last is a goal for service to the general math community.

With respect to the department and university I have the following goals:

1. I will continue to serve faithfully in my department assignments.
2. I will be a congenial member of my department with the goal to get to know every member of my department.
3. I will be a valuable, contributing member of my writing group. Each week I will bring something that I have written during the week for peer review from my group.
4. Serve on a Grant review panel.

Research Proposal

This research proposal will include a list of products that I plan to produce by the end of February 2018, as well as productivity strategies that I will use to complete these products within the proposed timeline.

- (1) In my faculty development plan, I discussed building upon my earlier successes in research to strengthen my research program. I included a list of projects that I have currently begun, and expect to finish in the next year.
- (2) The products that I wish to complete by February 2018 are the following:
 - a. An article that is currently near completion about Borcea--Voisin mirror symmetry. I expect to have this completed and submitted for publication by the end of June 2017.
 - b. An NSF subject grant. I will apply for a subject grant in the area of Algebra. This grant is due by the end of October 2017.
 - c. I have begun a paper with my Master's student about K3 surfaces with nonsymplectic automorphisms. I plan to have a rough draft of this paper by the end of the summer, and a final draft ready for publication by the end of the year.
 - d. I have begun work on a paper concerning the invariant lattice for K3 surfaces with an automorphism of order 16. I plan to have a rough draft of this article completed by the end of the year.
- (3) In order to achieve these goals, I will use a strategy that I learned in a book called *How to Write a Lot* by Paul Silvia. There he discusses increasing productivity by scheduling time to write, and sticking to the schedule. I will modify his advice to be including specifically setting aside time for scholarship every day. I will schedule at least one hour each day to spend exclusively on my research goals. I learned in that book, that those who sit down and write regularly are more productive by far, than those who write sporadically. I will also schedule two hours each week for reading scholarly articles about research in my field.
- (4) In order to evaluate my success, I will create a table to track my progress, and to track whether I wrote according to my schedule. Each week I will assess myself by the data I have collected on myself each day, and then I will recommit to writing according to my schedule. During the school year, I will also meet regularly with my writing group, and share something that I have written each week.

Citizenship Project

In my faculty development plan, I discussed my department assignments, and the need to not devote too much of my time to service assignments. Some of the goals that I listed there are beyond the scope of the Citizenship Project. Here I will list three separate collaborative goals that I would like to complete by February 2018. I have listed these in order of priority.

1. In the Math Department, we have a writing group that meets weekly to read what each of us has written and to give constructive feedback. In the past I have had a piece of my writing to bring about one third of the time. My first goal for the Fall Semester 2017 is to bring a piece of writing each week to be evaluated by my group. My plan for achieving this goal is related to my research plan. During the summer I will make a list of projects that I will have to write, and I will have something written on each project. Then I will week by week take these written pieces to the meeting of my writing group.
2. Our Department has a gathering each week, called the Soda Social---similar to what has been called Tea Time at other departments. In the past I have often worked straight through these gatherings, either because I was too busy, or because I forgot the appointment. My second goal is to get to know all of the faculty in my department some of whom I do not know very well. My plan for achieving this goal is to attend the Soda Social each week, and to spend my time talking with someone in the department who I usually do not talk with.
3. My third goal concerns moving outside of my department to establish connections with faculty from other departments. I plan to meet four people who I did not know before from other departments before February 2018. My plan for achieving this goal is to attend one event outside of my department each month and speak with someone there, who I did not know prior to the event. Examples of events that I am interested in attending include Lunch and Learn with the Faculty Center and the Writing around the Curriculum workshops.