STATEMENT OF TEACHING PURPOSE AND PHILOSOPHY

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1. Introduction

It has been said that “luck is the residue of design,” and in that sense, I have been very fortunate in my teaching experience. Over the course of many years as a teaching assistant at the University of Wisconsin, a KTI fellow working in Sennett Middle School, a Research Assistant Professor at Purdue University, and an I-Center Postdoctoral Fellow at Kansas State University, I have actively exposed myself to a large variety of courses and mathematical settings, ranging from sixth grade to graduate level. In addition, I have directed or co-directed two successful REU projects, on disparate topics. Here I will share some of my ideas on the subject of teaching; it is my hope that the end result will at least give an idea as to my thoughts on the subject.

2. Teaching Philosophy

While my methods may differ depending on the course which I teach (or, more probably, the level of course which I teach), my main ideas on the subject can be boiled down to two statements.

i) Each student within any math course has a valid reason for attending the course, which must be taken on its merit alone;

ii) Mathematics must take center stage in any math course.

While the second point may seem self-explanatory, the first probably is not, so I will elaborate. Too often as a professor, I have rated my students commitment to their mathematics identically with their love of the subject. This was already problematic, but I often compounded the error by attempting to use my class as a venue to show the beauty of math, so that my students may possess some of the love of the subject that I had. In addition, this mind-set seemed even to be ingrained within the curricula of certain courses I have taught. The best anecdotes which I recall from Kansas State are the so-called content courses for future K-8 educators (which, amazingly and unfortunately, often double with the “math for poets” courses given to liberal arts majors). Until very recently, a first content course for such future teachers consisted of units on election theory, fair division, and statistical data analysis. Who chose such a panoply of mathematical topics for a course which, ostensibly, was meant to provide content instruction for teachers? It would seem that such a course was based on the idea of making math fun and fostering love for the subject, rather than learning and understanding relevant topics to the hopeful teachers’ future disciplines. In some sense, these courses seem to ignore the reasons for their existence, and instead, attempted to “make math fun” by introducing many “interesting” topics to students who often disdain mathematics.
However, I came to a realization. As a math professor, I no longer see my role as a salesman. I accept that a student who enters my math course hating mathematics may also leave my course hating mathematics. Nonetheless, I also realize that regardless of such hatred, this student is in my course for a valid reason. My role is therefore solely that of a facilitator for the material of a given course. Whether or not a student of mine dislikes math, my job is to be a bridge to this student’s success, a success which is defined by the standards of the university, the student’s major, and the goals of the student himself/herself. If a student’s major requires only a C grade in math, and the student seeks only that grade, I will do what I can to ensure that deeds meet goals, and will harbor no prejudice because this particular student’s goals are not set higher. Of course, this extends to the teaching of courses themselves. While a topics course for graduate students may be more interesting to me as a mathematician, I know that my bread-and-butter assignments will mostly be service courses, and I dedicate just as much energy and excitement to those courses. Of course, I enjoy sharing math of any level to any student, even if that student’s interests are vastly different from my own. If that student comes to a greater appreciation of mathematics, all the better, but the ultimate goal is to ensure that I am not a hindrance to the defined success of a given student in a given course.

I make only one note regarding the second point. Again, I use personal anecdote to illustrate my position. As my evaluations will attest, I have generally been known as a “good professor” who “teaches his course well.” As anyone would, I enjoyed reading such evaluations, many of which praised my classroom demeanor. But ultimately, I read the comment, “I would never have made it through this course without Adrian Jenkins as my instructor!” too many times. Have I really performed my duties if a student has this belief? Should it not be the case that a student looks to himself/herself as the reason for success? It was then that I came to the realization that maybe my personality held too much of the floor in my classroom.

Again, I am not saying that a professor should be a machine, an automaton whose only purpose is to spit out data. On the contrary, I believe that likability is quite important to classroom success. But in the end, a course should be about the math, and not the mouthpiece. Thus, not only do I strive to ensure that students meet their specified goals, but also that they embrace their own success, rather than attributing it to me, or prayer, or luck, etc.

3. Undergraduate Research

I am a strong supporter of a broad-based idea of undergraduate research. I became interested in this idea as far back as my undergraduate days at Kennesaw State University. I was fortunate that a professor (Jonathan Lewin) was available and interested in working with me. Of course, I really had little idea of any original research project in which I would be interested (or for which I would be competent), so he agreed instead to lead me on a series of reading courses not only to bolster my knowledge, but allow me to get my feet wet with regards to independent reading (if not original independent research). I attribute a nontrivial amount of my success to these endeavors.

So, what is the point here? My feeling is that undergraduate research is an excellent tool to bring students into the mathematical community. However, I am not as convinced that one should push these students to develop original results; in fact, I am not convinced that
one should “push” these students at all. Rather, I have tried to guide students to their own interests, while letting them work at their own pace.

I have been fortunate enough to direct two undergraduate research projects in REUs at Kansas State and Purdue. At Purdue, we considered the computation of zeroes of holomorphic functions through numerical methods. While no original results were obtained, the participants learned a great deal, and ultimately presented their findings at the Ohio State Young Mathematicians conference. On the other hand, I also directed a project here at Kansas State regarding non-archimedean dynamics (and specifically, the estimation of conjugating power series). Unlike the students in the other project, the participants were looking for something more original, and so I considered some extensions of work I had done with a co-author (Steven Spallone, who also dedicated a week of his time to the project).

In both cases, I let the students work at their own pace, and while I was readily available to help them, I did not do their work for them. At the end of the day, I can happily say that all work done and all results obtained were claimed by the students. (While a forthcoming paper from an REU will have my name on it, this is only at the request of the participants themselves).

I understand that, given an NSF grant for an REU, there is a certain expectation from the university to produce results, often in the form of published papers. This is fine for students who attend an REU exclusively to work with a certain mentor, or on a certain topic. However, many participants do not fall into this category; honestly, how many of us knew exactly what we wanted out of math in our sophomore or junior years? Thus, I hope that wherever I work, I will be afforded the opportunity to direct “research” which is best suited to the student’s interest, whether that be original problems, or simply reading courses.

4. Classroom Methods and Final Remarks

I have no particularly strong feelings regarding classroom methods - my methods are based purely in pragmatism and utilitarianism. In short, whatever works best in a given situation is what I put in place. Often, such decisions must be made on a class-by-class basis. For example, it may be that one class gravitates toward a group work method - why should I force them into a lecture-discussion format? In general, I have had my best successes with group work when used in content courses for future teachers, and have had less success with this method as the level of the course has increased. However, there are always exceptions within each category; indeed, one of my worst experiences as a teacher (and easily my worst-evaluated) came in a teacher-content course built around group work and group discussion.

Finally, my views on the teaching of mathematics (and mathematics itself) are in constant flux. Today’s strong principle might be tomorrow’s forgotten tactic (if only the reader could also read my teaching statements from past years). I am always open to discussion for the improvement of my teaching.