TEACHING STATEMENT

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I believe that learning environment is the single most important factor to the success or failure of a classroom. I came to this conclusion when I was in undergrad and observing different math classes as part of my math education program. Two of the classes I observed were from schools only six miles apart, however they could not have been more different. The first of these two was a class of sixth graders in Sartell Minnesota, which is a predominantly white suburb to the city of Saint Cloud. The second was a high school class in a Saint Cloud school district which has a large black and Somali population. I saw the Sartell sixth graders enjoy their school day, even when they were challenged with confusing new concepts. The students in Saint Cloud however, were treated like prisoners. Unsurprisingly, the sixth graders were much more successful in their class because they were in an environment that supported their needs as a student. The students in Saint Cloud were subjected to an environment rife with racism and indifference towards their future, and the fact that any students managed learn in that classroom was a testament to their own tenacity.

In my time as a TA, classroom observer, student teacher and lead instructor, I have never observed a functional classroom emerge from a bad learning environment. In contrast, I have seen students overcome a myriad of "bad" pedagogical practices on the part of their instructor because they had a good environment to do so. In review of my observational notes on the two previously mentioned classrooms, I identified what I believe to be four key characteristics to a good leaning environment. These characteristics are equity among students, student cooperation, permission to fail, and institutional support. Furthermore, by focusing on improving these characteristics of my classroom environment, In the Spring of 2022, I was a recipient of both the Carl Lee Excellence in Teaching Award and the University of Kentucky Math department Diversity, Equity, and Inclusion Award.

1. Equity Among Students

There is a reason as to why I am calling it equity among students instead of equality among students. Students come from different backgrounds and have individual struggles that are unique to them. Because of this, students require attention and assistance that is unique to them. I give all of my students the same respect, but I recognize that the attention and assistance I give to students has to be catered to their needs as a learner.

I think the most problematic part about the Saint Cloud classroom was the vast inequities between students. The teacher was white and had no difficulty helping her white students or answering their questions. This was in stark contrast to how she talked to her black and Somali students on the occasions where she wasn't flat out ignoring them. I distinctly remember this teacher telling a black student that she wasn't allowed to use the restroom even though she had completed the day's assignment because she "had all of that extra time to go to the bathroom when she was being late to class." In reality, the student was no more than twenty seconds late, and in her seat ready to learn by the time the teacher had began the lesson. White students were not faced with such scrutiny about their restroom trips.

I'm not sure if the teacher was conscious of her bias against her students of color, but regardless students are perceptive enough to pick up on who a teacher likes and who they don't. what resulted from this was rather predictable; the class segregated itself. The white students worked in groups together and received assistance and attention. The rest of the class was treated as an afterthought. At this point it didn't matter how clearly the teacher could deliver a lesson. Her students of color could not reasonably be expected to learn in an environment where they are treated so poorly.

Observing this classroom helped me to understand how much our subconscious bias can lead to a toxic environment. I think about this class every time I start a new semester to remind myself that I have a responsibility to make sure students of color, women, and LGBTQ+ students all are made to feel valued in a math class taught by a straight man. I am conscious of who I call on in class, who I assist during work time, and who I socialize with before class. By being intentional about these actions, I better ensure that all my students receive the attention and respect that they need.

2. Student Cooperation

Students learn best in an environment where they see their classmates as collaborators rather than competitors. While competing for grades can motivate some students, these students would likely be invested in the class without being pitted against their fellow classmates. The rest of the students are left feeling isolated in a class in which they already doubt their abilities and are unlikely to find help from their classmates. For this reason, I do not grade on a bell curve. I also do not tell my students that an exam will be graded out of the top score (even if I were planning on doing so). However Simply avoiding these practices is often not enough to encourage cooperative learning. Having students work through worksheets in groups is a common approach to cooperative learning, but it can result in one student that "gets it" just doing all of the problems for the people in their group. To combat this, I like to have my students write their own problems and then give them to a partner to solve. This has the added benefit of making the students think deeper about whatever concept we are going over in order to find a suitable problem.

3. Permission To Fail

I often find that the idea of giving students permission to fail raises eyebrows. After all, failing is the exact thing we are trying to get our students to not do in our class. But we sometimes forget how much learning takes place when a student gets something wrong and we subsequently address it. I love when I ask a question in class and a student offers a wrong answer. These moments give me the chance to address misconceptions that multiple students likely have. If I oversaw a classroom where only the students that understand the material are willing to answer questions, then the students that struggle are left to do so quietly and with little assistance. The challenge is thus getting students who have historically felt intimidated by math feel comfortable enough to offer up potentially wrong answers.

I start every semester telling my students that my goal is to have them give me wrong answers every day. My students usually react to this statement with a mixture of chuckles and looks of concern. I then clarify that I am, in fact, not a masochist who wants to make their semester impossibly hard, but rather I see the value in correcting misconceptions. This can help students initially feel less intimidated in class, but it is even more important to reinforce this throughout the semester by responding to wrong answers in a constructive and encouraging manner. Because of this I have developed a three-step response to any wrong answer a student gives. First, I thank them for their answer. Second, if I am able to understand where their mistake came from, I say something along the lines of "I think you got to this answer because you were thinking X. Is that correct?" If I do not know how they got to their wrong answer I simply ask them to tell me what helped them come to their conclusion. Lastly, I acknowledge their misconception as being a reasonable mistake and then I correct it. This reinforces the correct answer without making the student feel stupid. Since implementing this method, I have observed a significant increase in participation across the board.

4. Institutional Support

I recognize that the environment I build in my classroom does not exist in a vacuum and the institutional support (or lack thereof) provided inevitably has an impact on the learning environment. The set of factors that fall under the category of institutional support is very broad. Everything from access to free tutoring to the noisiness of the building you teach in affects the learning environment. This is one reason why I saw so much success in the Sartell middle school classroom. Students

had access to iPads for note taking and homework, and there was plenty of funding for after school programs. If an individual student needed special assistance, they got it. On the other hand, the high school in Saint Cloud had very little funding to support their students in these ways. Many of the Somali students who had come to this country as refugees were thrown into classrooms without any support from translators. Instead, the duty of translator fell to other Somali students who had been in the country longer.

5. Research Mentorship

This last Summer I founded and organized the Discrete Algebra Research Team (DART), which is a small research group aimed at helping undergrads and grad students in the beginning of their program, gain experience in collaborative research. While I acted more as a mentor than a teacher during the program, I still structured our meetings with the same environment first mentality that I use when I teach. During our first meeting, before talking about any math I told the group that I expect us all to struggle with the material, and that it is absolutely okay to go extended periods of time without figuring out anything new. I said this because I wanted to give them permission to fail. I also told them that I didn't care if they were an undergrad or graduate student, because everyone in that work group was invited to take part because they were qualified regardless of their degree status. The purpose of this statement was to promote equity among the students. As the Summer went on I began pairing up the group members based upon the types of topics they were focusing on and had them work together. This created an environment of student cooperation. Now that the Summer is over, all of us in the group have a network of other mathematicians that we know well and are able to work with. Because of this I know that DART was successful regardless of what papers may or may not come out from our work this Summer. I do not know that I would be able to say this if I had not prioritized building a good environment.

I believe greatly in the importance of being a skilled lecturer with well-planned lessons. I also know that the environment in which that lecture takes place is of the upmost importance. These last few years of teaching remotely on Zoom showed us just how true that is. My unique path to graduate school has helped me be more conscious as to how I develop a positive learning environment so that I can best serve the needs of my students.