Juliette Bruce's Teaching Statement

1. Introduction. My primary goal as an instructor is to help my students learn. Learning is not something that can be achieved passively. Instead it requires students to continually grapple with what they know, what they don't know, and what they might know. With this in mind, I view my job as an instructor as one of active guide rather than passive knowledge presenter.

I like encourage my students to explore, engage with, and question the course material for themselves. This is not to say I set my students adrift with no guidance, but instead that I try to structure as much of the course around guided group work that gives students opportunities to develop and discuss their understanding and confusions with their fellow students. In addition to encouraging students to take an active role in learning, this format also forces students to learn to vocalize their thought processes and ideas, which further aides the process of learning and understanding.

While I find this active learning approach effective in helping students, it does present challenges to both myself as the instructor and to the students. Two of the largest challenges I have found and worked to overcome in my own teaching are creating motivation and managing failure.

2. Creating Motivation. The active learning method most rewards students who are actively involved in class, and engaged with the material. To be completely blunt, this is a lot to ask of many students. Despite what we might hope, not all, or probably even most, of our students arrive in our classes motivated solely by the desire to learn. Thus, I believe one of the most important parts of the learning process is motivating students to engage with the material and course.

Learning something new requires an extremely large amount of effort, and this effort is rarely exerted if the student believes the something they are required to learn can easily be replaced by their existing knowledge. Thus, when preparing for a course I try to keep the idea of motivation front and center. At the start of each major stage of the course I like to give the students problems that seem tractable, but which they are likely unable to do without the material they will learn later in the course.

For example, at the start of a first semester calculus course I like to ask students the following question:

Question: You are driving along a 45 km long toll road where the speed limit is 60 kph. Using the time stamp on your EZ-pass the police notice you completed the 45 km long journey in 40 min. From this info can the police conclude at some point on your trip you were speeding?

By doing this I hope the students begin grappling with the notions of average and instantaneous speed, and the relationship between them. Further, I hope to help the students realize that their current understanding of these concepts is not enough to actually answer this relatively innocent sounding question.

As the course progresses and the students learn the appropriate skills and tools I then reintroduce these problems to reaffirm that what they are learning is filling cracks in their understanding. So for example, the speeding question given above is reintroduced as a group discussion question when we are exploring the mean value theorem. In my experience this method has proven to be enjoyed by students, and seems to help increase their motivation.

3. Managing Failure. The second challenge that I think is crucial to the learning process is managing failure. In many ways, the most significant moments during the learning process are not necessarily the moments of success, but instead are the moments of failure. In particular, the

time students learn the most is when they realize something they are doing is incorrect. It is at this moment that students have the ability to recognize errors and gaps in their understanding of a subject and can begin trying to correct them. It is also the moment that as an instructor I can begin to realize what my students are finding difficult and nudge the conversation in such a way as to overcome these hurdles.

Making mistakes and failing is hard. Most students, like most people, would prefer not to make mistakes, and certainly do not want to fail in front of others. With this in mind I think it is crucial to promote an environment where all students feel comfortable and safe participating and engaging. It is only in such an environment are students willing to let their guard down and be open about what they are confused by and where they are making mistakes. Creating such an environment can be challenging, however, I have found that by being honest and creating clear community expectations such an environment can be fostered.

For example, at the beginning of each course I like to take the time to have a open and honest conversation with my class about what sort of environment best promotes their learning. Through this discussion I work with the students to develop a set of community expectations for our classroom. That is a set of things we all agree that we will expect of ourselves and our classmates. Common items on these lists include things like: critique the answer not the presenter, avoiding telling someone *they* are wrong, but instead say I think there is a mistake in the *argument*, etc.