Teaching Philosophy – Candace Walkington

My growth as a mathematics educator has stemmed from my work in several areas: as an instructor in 5th and 6th grade mathematics classrooms, as a college professor teaching content and methods classes for pre-service teachers, and as a researcher examining teaching effectiveness and students' mathematical thinking. My teaching philosophy centers on using classroom discussions, collaborative group work, and learner-centered approaches to engage students in actively constructing meaning while exploring issues of teaching and learning. My courses leverage technology – I use virtual manipulatives and dynamic simulations, lead discussions of videos from classrooms and popular culture, manage online assignments and discussions, and have students access to research articles, lesson plans, and other important educational resources. My students create engaging video "anchors" for instruction, and use video of their own teaching as an instrument for reflection. These tools fit into my overall teaching philosophy, which includes a focus on making learning accessible and taking into account student diversity, facilitating teachers building content and pedagogical content knowledge, and promoting critical thinking, reflection, collaboration, and professionalism. In the sections below, I discuss how these principles apply to the courses I plan to teach.

Courses for Pre-Service Teachers

As an NSF GK-12 Fellow, I taught elementary mathematics classes at a high-poverty rural school and was trained in inquiry learning. I center my teacher education courses on creating "times for telling" (Schwartz & Bransford, 1998) by introducing each topic with guided discovery activities where pre-service teachers work in groups to uncover the "big ideas" in different areas of mathematics. They progressively mathematize their ideas by collaborating around their formal and informal knowledge and experiences. I draw upon *model-eliciting activities*, pushing my pre-service teachers to create general mathematical models that are sharable, reuseable, and modifiable (Lesh & Zawojewski, 2007). I lead class discussions where they communicate, refine, and critique the mathematical models they develop. My pre-service teachers engage in a project where they design and teach their own guided discovery lesson, and then reflect on their experience. This is a transformative activity, as they get first-hand experience seeing the effectiveness of discovery methods for promoting conceptual learning.

My philosophy also accentuates building teacher's content and pedagogical content knowledge. In order for teachers to deeply learn mathematics, they must see its application to their practice. Likewise, in order to implement strong teaching methods that support learning, teachers must understand the nature of the mathematical content. A primary goal in my courses is allowing teachers to discover the big ideas in mathematics and realize connections across these ideas, while also gaining an understanding of the "mathematical horizon" of where these ideas will lead. I believe that when teachers develop genuine interest in problem-solving and in teaching mathematics, they become lifelong learners who develop their own mathematical understanding over time. One of my students recently wrote: *"I can not begin to tell you how much of an influence you made on me. I love Math because you showed me my invented algorithms thought process was not wrong. I'll always remember you when i am a teacher."*

Teachers are concerned with issues of equity and diversity, and in my courses I provide tools and strategies for working with diverse populations. For my dissertation, I spent one year in Algebra I classes at a high-poverty urban high school, where students were taught procedural skills with little meaning behind them, targeted towards frenzied test preparation. My investigation revealed that these students had

enormous mathematical "funds of knowledge" (Moll & Gonzalez, 1997), and my courses focus on training teachers to value students' prior knowledge, experiences, and diverse ways of reasoning as a powerful tool to promote equity. One of the culminating events in my courses is a debate over teaching standard algorithms versus valuing and exploring students' invented methods. This debate allows my teachers to grasp the importance of understanding children's thinking. Similarly, I incorporate principles of *Cognitively Guided Instruction* into my courses - my students conduct problem-solving interviews with children to learn practices of formative assessment and designing for future learning.

In-Service Teacher Education / Professional Development

As part of a team involved with teacher evaluation and training within the UTeach program at the University of Texas at Austin, I worked on developing and piloting a classroom observation protocol to measure teaching effectiveness. This project pushed me beyond considering only my own experiences, as I observed UTeach graduates working in a variety of school contexts, often struggling to reconcile UTeach's focus on inquiry and reform-based teaching with the reality of their school environment. I gained particular insight into the needs of in-service teachers, who often have rich practice-based knowledge and solid pedagogical training, but struggle with issues of implementation. I believe in supporting these teachers in modifying activities to fit with their context and highlight their knowledge and experiences, while also encouraging them to become advocates for change in their school settings.

In partnership with the *Measures of Effective Teaching Project*, I ran a large national study of teaching effectiveness in elementary mathematics. Using my own experiences and philosophy in conjunction with the UTeach vision, I trained 100 in-service teachers to make critical distinctions in teaching practice – such as facilitating surface level versus deep level engagement, demonstration of content and pedagogical content knowledge, and making authentic connections to prior knowledge and experience. Participants found the training to be a valuable experience that allowed them to reflect critically on their own practice and beliefs. One teacher wrote *"I want to tell you that I feel that my teaching has greatly improved as a result of being trained in UTOP. I have been teaching for over 25 years… in the past few weeks I have seen a big change…"*

Graduate Courses in Education

As an instructor of graduate courses, I will focus on exploring research in mathematics education and the learning sciences and its implications for teaching and learning. As a teaching assistant for the UTeach course on Project-based instruction, I discovered how learning sciences research can be meaningfully related to teaching practice through critical class discussions, relevant teaching experiences with feedback and reflection, and extensive in and out of class collaborative group work. My courses, like the research I myself conduct, will incorporate a variety of theoretical perspectives, including cognitivist notions of learning and performance, situated descriptions of students' adoption of participation practices, and embodied views of cognition as perceptual and motor-based. Further, I come from an integrated STEM education doctoral program and conduct research within a cross-discipline learning sciences center. Thus my courses will incorporate studies of teaching and learning across domains.

While it is essential for graduate students to become involved in understanding and applying educational research, it is also important to support their development as producers of new knowledge. My graduate courses will strive to help students articulate clear research purposes, use strong methodologies, and

recognize how new research can contribute to the field. These courses will also focus on implications for practice – educational research must confront the real problems that face schools today. Further, since many graduate students in education currently teach or will go into careers that involve teaching, the principles of effective teaching I share with pre-service or in-service teachers are appropriate for both their research and their own teaching practice. Mentorship is also an essential part of working with graduate students - I currently work on several grants where I collaborate closely with and provide mentorship for graduate students in math education and learning sciences programs. Graduate students need strong and accessible role models, critical feedback, and many opportunities for collaboration within and across institutions, but ultimately they must be given the freedom and agency to develop their own research trajectory.