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### Teaching Portfolio Summary and Reflection

I have always enjoyed teaching. I have always enjoyed learning from excellent teachers and wanted to evoke the same response in my students. While I have confidence that I can communicate well with, entertain, and engage my students, I have always felt that I was missing some intangible and unidentifiable component that enabled me to reach *all* of my students and to ensure that they were invested in the material and not just the presentation. During the course of my professional development as a teacher, I have learned that my inability to decipher this root cause and the key to getting students to invest in the material are one in the same. The most important lesson that I have learned throughout my teaching experiences, and the Certificate of Accomplishment in Teaching Workshops (CoAT) in particular, is the power of *reflection*. Reflection is a tool both for identifying ways to improve my teaching and a technique for students to assess and promote their own learning. While effective teaching is the key to promoting effective learning, the key to effective teaching *is* learning.

The importance of reflection and self assessment was not apparent to me at first other than in a vague, offhand way. Understanding the importance of reflection came about through participating in the professional development workshops and conducting research on education. The CoAT workshops that I participated in educated me on several subjects, ranging from the psychological differences in the learning needs of students to how to engage a variety of students through different forms of questioning. Every workshop required a reflecting on the workshop topic, reflecting on personal experiences related to the topic, and describing how newly acquired knowledge would shape future teaching objectives. While the workshop material itself was new and interesting, linking this material to past teaching experiences was the key to understanding its value. For example, the CoAT workshop on learning styles covered “global” learners who may often lost as new material is presented, but then suddenly “get it” when they make a mental connection to related material they have already mastered. My mind immediately went to the handful of students in every class who, not for lack of effort, seemed to fall behind and simply not grasp the material, yet at times were capable of discussing the broader implications of a particular software technique or practice with far greater insight than their peers. Having gone through my own revelation by means of reflection, I can scarcely forget this lesson when I enter the classroom. Now, I go to pains to communicate the material in such a way that is appropriate for global learners as well.

For me, education research is a form of scientific reflection. Inspired in part by workshops on the Felder-Silverman learning styles, I have conducted a number of studies on personality types and learning styles in the computer science classroom and studies on engaging women and ethnic minorities in the discipline. Critically analyzing the data in these studies, as well as summarizing and synthesizing the results of similar research, has a similar effect to workshop (or classroom) reflection. As a scientist, this empirical feedback holds special power for me. I could see, reflected in the evidence, the improvement in the performance of students with a particular personality type when

exposed to a teaching style that reflected their learning needs. I read an analysis of student interviews suggesting that pair programming increases their confidence in completing an assignment. I am surely not the only one who finds empirical evidence compelling. There are undoubtedly many students who would respond positively to seeing subjects they learn throughout a course in a practical setting, such as in popular applications like YouTube or Facebook, or to see the raw figures that depict the costs and benefits of choosing a particular programming language, such as the lines of code required or the time spent developing an application.

As the importance of reflection and self assessment on the part of the instructor became apparent to me, I realized that similar reflection must be important for students as well. Both student and teacher are learners. While I reflect on and assess my teaching abilities, the students should reflect on the course material and assess whether and why they are learning the subject material. This strikes me as the key to getting students to invest and take interest in the course material (if, indeed, it is worthy of interest)! However, it was unclear to me how to foster this behavior among students. The traditional means of classroom assessment (exams, homework assignments) are mostly a benefit for the instructor but a burden to the students. Fortunately, and through an accident of scheduling, I enrolled in the online CoAT workshop on “Classroom assessment techniques,” which I can confidently identify as the most important workshop in which I have participated. The workshop provided concrete examples and resources with which to promote self assessment among students and to provide feedback to the instructor on the progress of the students. Exercises such as drawing concept maps, writing one sentence descriptions, or creating application cards helps the students to understand what they have learned, to determine what the instructor deems important, and to examine the material from a variety of perspectives. The act of reinforcing what has been learned, why it has been learned, and why it is personally important is as important to my students in their academic development as it is to me in my professional development.

Most of my professional development activities occurred after I had served as a teaching assistant. Thanks in large part to the CoAT workshops, I am armed with confidence and a multitude of concrete strategies and resources with which to meet challenges that I faced as a teaching assistant. I have learned to promote active learning in a large classroom by punctuating lecture with frequent in-class exercises with partners and to set expectations early for class participation. Before when students came to me before for advice on non-course matters, I often had nothing to offer them other than wisdom based on experience. Now, I know to treat such experiences as teaching opportunities where first the learning objective must be extracted from the student and then help them set goals for meeting their objective. I have learned that it is possible to create a universal design for teaching, where specific strategies for presentation and assessment can be leveraged to appeal to students with a variety of personality types, goals, and personal situations. Most importantly, I have learned the value of reflection and self assessment for my students and myself, which will lead to my future growth as an educator, mentor, and administrator.