Self-Reflection Teaching

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Self Reflection
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Effective teaching is not about what we give or do to our students. It is about how we stand in relationship to them and how they come to see themselves in relationship to the subjects they study and teach. The question that frames my philosophy of teaching is …Where do my students come from, what do they need to know to keep growing and how can I best support them in getting there? The challenges I have encountered in being an effective teacher are getting to know each student in order to understand how education and science fit into their lives, figuring out how their values and beliefs either inhibit or enhance their growth, challenging them to do their best and be confident, standing strong with them when they get wobbly, helping them realize what it means to be scientifically literate, and in the end helping them integrate their experiences into extraordinary capacities to keep growing on their own.

My teaching career spans 30 years and includes significant teaching and administrative experiences at the early childhood, elementary, secondary, and post secondary levels.

My teaching at The University of Iowa, Science Education Center (1987-1995) was connected with The Iowa Chautauqua Program (ICP). As one of the most prestigious centers in the world for science education, The U of I Science Education Center initiatives were focused on developing innovative, leading edge approaches for educating science teachers. As co-director of the ICP, I traveled with a team of master (practicing) science teachers and graduate students to teach weekend and summer, graduate level, workshop courses for practicing K-12 teachers in professional development schools and Area Education Agencies across Iowa. These teaching

experiences helped me come to realize the power of making learning personal, local and relevant for teachers.

Since coming to UMBC (1995-2002), I have been teaching EDUC 330/623 Teaching Science in the Elementary School/Instructional Strategies for Teaching Science in the Elementary School (taught each Fall and Spring semester) and EDUC 332/629 Science in the Secondary School and Instructional Strategies for Teaching Science in the Secondary School (taught each Spring semester). In addition, my other teaching responsibilities include, developing and teaching courses in The Egyptian Teacher Leader Program, mentoring Ph.D. and MA students, mentoring university science faculty in clinical settings, advising Post Baccalaureate teacher candidates and secondary science teacher candidates, supervising secondary science interns each semester, advising interdisciplinary studies capstone projects, and facilitating independent study course experiences.

The methods courses that I teach are built upon constructivist learning theory, and promising practices for effective science teaching as defined by *The National Science Education Standards,* INTASC and NCATE Standards for excellence in teacher preparation. I strive to model the practices that the teacher candidates will be expected to use in their own classes. This means that there is less emphasis on typical lecture and discussion and more emphasis on meaningful hands-on, minds-on, inquiry approaches. Active learning and performance assessment is emphasized.

*The National Science Education Standards (*NRC 1996) and The National Science Teachers Association (NSTA) call for a reexamination of how science methods courses are taught and underscore the importance of modeling promising practices for teachers.

The teaching practices in EDUC330/623 and EDUC 332/629 reflect my philosophy of science teaching that includes the following beliefs:

- The teaching and learning of science is an active process where both teacher and student view themselves as learners;
- Excellence in science teaching means moving beyond the status quo;
- Teachers learn best through direct experiences with students and other teachers;
- Human experiences provide the richest contexts for the teaching and learning of science;
- Meaning is personally and socially constructed;
- Exemplary science teaching demands a strong understanding of science content and pedagogy as well as positive and professional attitudes.
- Professional integrity endures.

The central aim for both science methods courses is helping the teacher candidates realize that science is not the static body of knowledge and facts that they have experienced many times in past courses but rather a way of questioning and knowing the world. The curriculum frameworks for EDUC 330/623 and EDUC 332/629 have evolved over the past seven years. A constructivist foundation was built for these courses through the work that I did with The Maryland Collaborative for Teacher Preparation (MCTP), especially for EDUC 330/623. As part of the MCTP transformations, authentic learning experiences were built into both methods courses that facilitate the modeling of constructivist teaching practices. The courses include special workshop experiences and service learning practica.

The two workshops included in the elementary science methods course (EDUC 330/623) are The Global Learning Observations to Benefit the Environment (GLOBE) and The Solar System Educator Workshop. The GLOBE workshop is also part of the Egyptian Teacher Leader Program and was part of the secondary science methods course (1999-2002). I brought the GLOBE Program to UMBC. UMBC is one of the first universities in the country to be implementing the GLOBE training with preservice teachers. The Solar System Educator Workshop is done, within the course, by the director of the SpaceLink exhibit at The Maryland Science Center. The ***science methods workshop model*** used in these courses provides UMBC teacher candidates and Egyptian science and math teachers with an opportunity to learn science and pedagogy within authentic contexts and for very specific professional purposes.

A variety of venues have been used for the elementary methods ***service-learning practica experiences.*** Currently, the elementary methods students are involved for a fifteen-hour/semester teaching in the SpaceLink Exhibit at The Maryland Science Center. In the past, students have been involved as tutors with The UMBC Choice Middle School Project, in after school programs in Howard County Maryland Public Schools, and as teachers for UMBC MindFest. The instructional transformations linked to these courses have been disseminated at several professional research conferences.

Both the elementary and secondary science methods courses culminate with a course exit interview where students discuss their growth and development and review the work they have done across the semester. These exit interviews provide me with the opportunity to review the student accomplishments/assignments across the semester with their voices beside me.

Teacher candidates enrolled in the elementary and secondary science methods courses are evaluated on their ability to design implement and assess developmentally appropriate science instruction for all students. Students who expect a more traditional methods experience are often resistant to this way of learning and to viewing science in this way. SCEQ evaluations of the course are not the best measure of impact as the university evaluations are designed for more traditional lecture/discussion teaching approaches. Students have often commented after taking the course that the evaluations do not match or accurately reflect how they have benefited from the course. The student reflections that I have gathered show that the course impacts students in strong ways – see student reflections in *Evidence Matrix – Teaching* folder on this disk. Students are asked to provide additional feedback on what they have learned during individual course exit interviews and through written reflections assigned across and at the end of the course. Faculty peer observations are not part of the teaching evaluation process in the UMBC Department of Education so formal feedback on faculty teaching comes only through Student Course Evaluations Questionnaires - SCEQ.

Another very interesting and rewarding experience I have had at UMBC is the curriculum development and teaching that I do as part of The Egyptian Teacher Leader Program (ETLP). Since the ETLP began in 1997, we have designed, implemented and evaluated a curriculum consisting of five courses and a series of integrated school visitations (See Clinical Scholarship - Self-Reflection for student and faculty impact statements and www.umbc.edu/egyptian - best viewed via internet Explorer).

I teach the Professional Development course for the Egyptian science teachers. The challenge for all of us working in the ETLP has been connecting the learning

theories we promote to practical applications that are appropriate for Egyptian classrooms with 40-50 students and a national curriculum that values lock step, direct teaching approaches. As the Co Director of the program, I collaborate with another mathematics faculty member, two English teachers and mentor three graduate students in planning and delivering the program each semester. In 1999, The Egyptian Teacher Leader Program was recognized by The University Continuing Education Association (UCEA) and received their award for Excellence in Non-Degree Programs.

In addition, I have mentored 8 master's degree students, 2 Ph.D. students (one student in dissertation phase and another entering the program), several independent study and interdisciplinary studies projects. I have also served as a clinical supervisor for secondary science interns during their student teaching experiences – see chart under Section A in Teaching Evidence Matrix.

It is one thing to affect the teaching and programs in the UMBC Education Department and quite another thing to have and impact as a clinical professor in other UMBC departments. I am extremely proud of the work I have done outside my department at UMBC. From 1995-1997, as part of the UMBC/NSF/MCTP program, I served as a clinical mentor to Dr. Phillip G. Sokolove, UMBC Professor of Biology. We worked together to integrate STS active learning strategies into BIO 100; attempting to help him move away from the teacher-centered lecture approach he had been using for 25 years. I observed each class of his BIO 1000 introductory biology course for one year and intermittently for another year. During the first year, I provided clinical feedback on an as needed basis with focused weekly debriefing sessions. During these weekly clinical coaching sessions we made adjustments to the curriculum and instructional approaches.

Since then, Dr. Sokolove has gone on to receive additional funding from The National Science Foundation based on the pilot comparison study that we did together and has received the highest honor The University of Maryland System (USM) awards for excellence in teaching. The improvements in science teaching resulting from this clinical partnership appear to be significant and lasting.

The work I have done as an assistant clinical professor has had an impact on the larger UMBC curriculum offerings as well. I worked with others science professors as a clinical advisor is creating an undergraduate interdisciplinary science laboratory course – Science 100. This is the first course of its kind at UMBC and the first in the UM System. The course is taught around the theme of water and engages students in team scientific inquiries tied to local hydrology issues. The course has an enrollment of ~200 students.

There are two additional and significant projects on the horizon for me designed to have a direct and powerful clinical impact. The University System of Maryland (USM) in partnership with UMBC and 5 other Maryland higher education institutions was awarded (October, 2002) a National Science Foundation (NSF), Mathematics – Science Partnership (MSP), targeted award for $7,400,000 to work with Montgomery County Public Schools high school science teachers helping them improve science teaching and implement the new state assessments. The USM Vertically Integrated Partnership Program (VIP) proposes a comprehensive teacher development initiative that will train all high school science teachers across the next five years. The project will also identify professors from each partner campus who will serve as content experts – clinical fellows - providing ongoing support to the teachers and their students. The professors will learn more about best practices in teaching while working with the teachers. This

project began in October 2003. I helped conceptualize and write this collaborative teacher enhancement project and will serve as the PI of the program on the UMBC campus.

The other collaborative project, in the proposal stage with NASA, is with The Global Learning Observations to Benefit the Environment (GLOBE) Program. This project is designed to reengineer the professional development model for the training of GLOBE teachers around the world. I have been suggesting that the current training model lacks ongoing support features and does not promote leadership among the GLOBE teacher network. This proposal will address these needs directly and introduce a stronger Science/Technology/Society (STS) curriculum focus. The plan involves connecting UMBC elementary science preservice and practicing GLOBE teachers for practicum experiences in area GLOBE schools. The impact of this project, if funded, will strengthen our relationship with GLOBE/NASA and provide us with another opportunity to help teachers build stronger science education programs for teachers around the world.

The best part of teaching for me is that I learn and grow from teaching and working with the preservice and practicing teachers. If the teaching experience has not changed me in some fundamental way, then it has not been successful in my mind. My UMBC teaching experiences have changed me. My teaching has afforded me the opportunity to learn more about critical issues and questions related to effective urban science education, to connect to local community resources and informal science venues, to connect to area school districts and science teachers in truly meaningful ways, to ask and explore new questions with other faculty and graduate students related to improving

science teaching, and to continue testing and questioning the impact of personal, local and relevant learning challenges for preservice and inservice science teachers.

Please see other file on this disk labeled *Evidence Matrix - Teaching* for information and evidence of the teaching that I have described in this narrative. All materials included in the *Evidence of Teaching* column of the matrix are hyperlinked – all the reader needs to do is hold down the CTRL button on the keyboard and left click mouse at the same time to view the evidence. The matrix includes information on my teaching efforts since coming to UMBC in 1995. My curriculum vita includes a complete record of my teaching experiences.