Introduction:

As I strive daily to improve myself as a chemistry instructor, I continually reflect upon my years as an undergraduate. This reflection is not difficult to do, since I work with many of my former undergraduate instructors, I teach in some of the same classrooms and labs that I learned in as an undergraduate, and I am surrounded by students with similar backgrounds to my own on a daily basis. Because I carry what I have learned from my beginnings as a chemistry student at UW-L full circle back to the place I am today, I try to teach in a way that is mindful of where I have come from and of those who have helped me along the way. I also motivate my teaching with the idea that maybe my actions in the classroom, or the letters of recommendation that I write, or the five minutes I take out of my day (even when I think I am too busy), or that email that I answer at 11 PM, may have an unexpected positive impact (please see attached “Letters of student appreciation”) on a student’s academic career. I do this because I know with certainty that I would not be who I am or where I am today without a lot of support and inspiration from my undergraduate instructors; many of them have done the aforementioned things for me along my journey.

I have grown a lot in my last three years as an instructor. I am much more confident in my presentation and delivery of course material because I have experienced firsthand which techniques work and which do not measurably improve student learning. My explanations are much clearer and more concise. I have also greatly improved upon explaining concepts in a more conversational tone, because I rely very little on my notes when delivering lectures or answering questions. In retrospect, I never imagined that I would grow so much as an instructor, be as successful as I have been, or enjoy my job to the degree that I have. In this document, I wish to share some of my more notable successes and contributions to the chemistry department, college, university, and community.

Effectiveness of Teaching:

My Student Evaluation of Instruction (SEI) scores have improved with each successive course offering; this has caused me to continually move up in the departmental rankings. Most notably, during the Fall 2011 and the Spring 2012 semesters I taught an overload of three contact hours (an additional General Chemistry I Laboratory course) and was still ranked number one and number two, respectively, within the department for those semesters. During the eight week Summer II session of 2012 I also taught an overload. I had two sections of Organic Chemistry Laboratory (one section is typical) for a total of 24 laboratory instruction hours per week. I am particularly satisfied with my accomplishments because when I agreed to teach additional lab sections, I wanted to be able to maintain or even continue to improve upon my current success despite the additional challenge that I knew I was taking on. Further evidence is contained within Dr. Sandra Koster’s peer evaluation letter.

CHM 305 (Organic Chemistry Laboratory):

When I first started teaching CHM 305, I evaluated the students using graded problem sets, lab reports that included a written conclusion analyzing the results and success of the experiment, and midterm and final exams. After carefully considering all of the comments that I received from student evaluations and the discussions with many students, I have since significantly changed how I evaluate my students. The first issue I addressed was how students prepared for the exams. While the problem sets gave the students practice with the current course material, I found that the students were frequently requesting several smaller evaluations prior to the midterm exam in order to give them a
true sense as to whether or not they were truly grasping the material to the required depth. In response to this request, I turned the problem sets into practice problem sets with the answer keys available on D2L. I also started giving in-class quizzes on the material presented for each experiment. I found that this has helped students better retain and stay current on the course material. It has also allowed for me to refer to the material and to make comparisons to previous techniques/theories when introducing new concepts with confidence; I know that the students have thought about the previous material in preparation for the quizzes. I have noticed that the amount of student participation has also increased because the students are more comfortable and confident in the material and their reasoning. Furthermore, these early and frequent evaluations allow students and me to recognize difficulties early on in the course and to set each student up for his or her best success.

The second issue that I addressed in CHM 305 dealt with improving students’ writing; particularly when it came to the formal-writing conclusions section of their lab reports. As I note in my syllabus, one of my learning outcomes for organic lab is to get students to “critically analyze and interpret experimental data and results and summarize the experimental findings.” I discovered over the first couple of semesters of teaching this course that many students had a difficult time knowing what and how much information to include in their conclusions. This was particularly unfortunate, in my opinion, because it meant that not all students were maximizing their learning from this activity. While some students were able to complete this task with ease and write with great clarity and conciseness, others struggled to analyze most of the collected data because they just did not know what to analyze. To help with this, I designed coversheet/question sheets (see attached sample coversheet/question sheet) that require students to summarize their results and answer a series of questions related to their collected data. In turn, I have found that I am able to more quickly and fairly compare and assess my students’ understanding and I am able to get them to think about their data in ways that many were consistently and completely missing in the past. Again, I have seen student success increase. I can ask more challenging, problem solving type questions on the exams because I know that the students have had sufficient practice interpreting their own experimental data. I have also seen the percentage of students getting these problems correct increase. It has been extremely rewarding and a major teaching success to read the answers the students give to these questions and to be able to truly get a sense that the students are grasping what I am teaching them.

Thirdly, I recognized the need for students to perform the techniques in the lab before explaining the theory behind the lab techniques. It has really been beneficial to be able to refer back to what the students just saw or did in a previous laboratory period to make the theory more understandable and better able to be grasped by the students.

Finally, with the numerous assignments and tasks that students need to complete in CHM 305, I decided that there was a unique need to help the students become well organized. To facilitate this, I assign a color (pink, orange, yellow, etc.) to each experiment performed in the lab. Then, everything associated with that experiment (handouts, notes, quizzes, coversheet/question sheets, etc.) is copied on that color of paper. I provide the students with a calendar (see uploaded example month of April for the Spring 2012 semester) where each assignment pertaining to a particular experiment is highlighted in its corresponding color. I continue to improve the calendar each semester to make it even easier to follow. It is really impressive to see a whole classroom of students with really organized binders of course materials. They really adapt well to this organizational system and I have received countless compliments in student comments on evaluations as to how helpful this system was for them.
Teaching Philosophy

With students using computers more and more every day, I also post a comment on D2L that pertains to each class meeting. It always says what is due and what we are doing for the day. This only further strengthens what is presented in the calendar. I have seen a significant decrease in confusion in the agenda for each lab period since implementing these things.

CHM 103 (General Chemistry I) Laboratory:

I have also adopted my CHM 305 color-coding system to my General Chemistry I Labs (and this system has also been very well received by my introductory students). Students at this level are often in need of guidance as to how to organize class materials and this gets many of them off to a good start in college. My teaching development in CHM 103 Labs has also been focused on organization of the material that is presented. During my first semester teaching CHM 103 Labs, I realized that it was challenging for students to see the board and to quickly copy down some of the more complex diagrams and graphs that I was presenting due to the layout of the lab benches, so I developed fill-in-the-blank note sheets (see attached Experiment 7 Note Sheet as an example). I have found that the students have been very appreciative of this organized way of taking notes. They are able to spend more time focusing on the content and theories being presented, and they have more time to process the information and ask questions as the material is being presented. In recent semesters, I have seen more students asking questions; this encourages others who wouldn’t normally ask questions to participate, and it makes the lab more welcoming, friendly, and productive.

In all of my courses, I carefully demonstrate the new techniques at the start of the class and, while the students are performing an experiment, I then continually walk around the lab and observe what the students are doing and ensure that they are working safely. It gives me time to interact with each of them individually, which in turn allows me to discover their career goals and to learn more about who they are as people. I find it makes lab more comfortable and enjoyable and makes me more approachable. Students are more willing to ask questions about the experiment as I walk around, and it allows me to be sure that the students are correctly collecting the necessary data. They seem much more receptive to corrections and advice from me if something is not working and much more willing to let me know when something is not going well for them. I am a strong advocate in students experiencing success in each lab because that allows them that extra opportunity to practice the technique the correct way. I have found that the students appreciate my help in ensuring that they have a good experience in lab.

Summary:

While I have enjoyed my overall experiences teaching General Chemistry I & II Laboratories and Organic Chemistry Laboratory, I look forward to expanding the courses that I am able to teach in order to continue to advance in my career. I am particularly interested in teaching discussion sections in General Chemistry. I find that many of my lab students feel comfortable coming to me to ask questions and getting additional practice with lecture material. And it’s rewarding to be able to work with students and to see their improvement in their lecture exam scores and to see their confidence in themselves grow. I think this kind of interaction is particularly important at the General Chemistry level because this sets students up for success in the courses that will follow. It also encourages students to get help from their instructors, and I feel like I could encourage this even more by interacting with the students in discussion sections.
**Scholarship of Teaching**

My departmental role as the CHM 103 (General Chemistry I) Laboratory Coordinator gives me the opportunity to work in both scholarship and service capacities. In terms of scholarship, I have used my experiences in preparing CHM 103 experiments to work with Dr. Katherine Friesen and, more recently, with Dr. Yevgeniya (Eugenia) Turov. Our collaborations have resulted in a series of short, instructional videos that demonstrate the correct use of chemistry laboratory equipment and proper laboratory technique to the General Chemistry students. We have submitted a grant proposal related to this work to the Spencer Foundation that was not initially funded, but we are currently revising and intend to resubmit this proposal during the Spring 2013 semester. We have purchased a video camera with department funds and have begun filming these short videos. Our goal is to have a complete series of videos by the start of the Spring 2013 semester that are uploaded on a CHM 103 Desire2Learn (D2L) site that can be accessed by all of the instructors in the department and subsequently distributed to their students as needed. Current and continuing students in chemistry would then have access to these techniques and could review them at any time as they progressed through their courses. This project is something that was created partially as the result of comments made by students (especially those with little previous experience in the chemistry laboratory) on my evaluation forms. I received a number of comments about how challenging it was for some students to read through an experimental procedure without a visual guide as to how to handle and use the chemistry laboratory equipment and glassware. I have already begun thinking about how this project could be further expanded to benefit my organic lab students and am excited to work toward this in the future.

I have also been working in collaboration with Dr. Turov to produce an instructor’s resource manual for the General Chemistry I Laboratory (see the related discussion of this in my Service Narrative). When complete, this resource will include: safety precautions (along with proper disposal of any generated chemical waste), common pitfalls encountered by students (and solutions to preventing/overcoming these pitfalls), sample student data, and detailed solutions to all of the homework questions in the lab manual. Since starting in the Fall of 2009, I have generated weekly memos that I send to all of the Chem. 103 lab and lecture instructors that highlight these topics. However, I am working to expand and organize these memos so that they can become a part of a standalone resource that faculty and staff always have readily accessible (either online or printed and bound). This type of resource should be particularly helpful for new faculty and staff, as well as for seasoned instructors who are teaching the course for the first time. It will also prove beneficial to any future lab coordinators that wish to develop a similar resource or that wish to help prepare the Chemistry 103 labs. This is an ongoing project that will continue to be expanded upon.

Along with the instructor's resource manual, Dr. Turov and I (with contribution and suggestions from others in the department) are revising the laboratory manual given to students each semester. While (for now) the list of experiments will remain the same, the procedures and data sheets are being rewritten and/or updated to enhance student learning and understanding, as well as increasing student efficiency and safety in the lab. To assess the effectiveness of our revisions, the rewritten experimental procedure for Experiment 4 (where students are asked to
carry copper through a series of reactions) was given to a group of students after they had prepared for the experiment using the old experimental procedure. The general consensus among the students who received the new experimental procedure was that it was superior to the older version. Students appeared to be better able to focus on the chemistry occurring in the reactions and had an easier time perfecting the newly learned techniques. Efficiency also seemed to improve, as indicated by the additional time students seemed to have in lab. This gave the students more to ask questions about the homework and their recorded observations. In addition to rewriting the procedures for many of the experiments, the manual is also being revised to include more background explanation on the theory and concepts being taught in the lab. This should help students to correlate what they are doing and seeing in the lab to what is physically happening in a reaction or experiment. All of these modifications to the lab manual directly support one of my main learning outcomes; namely, to “reinforce and expand upon lecture concepts by performing laboratory experiments.”

**Organic Chemistry Research**

When I was an undergraduate at UW-L, I did research with Dr. Curt Czerwinski. Last semester I reviewed a paper that he had prepared which contained some of the research I conducted at that time. I found this process of review to be very educational and beneficial. I learned a lot by reading and providing feedback on the paper and looking up and checking resources. This is something that I look forward to doing more of in the future and I would be interested in working in a research lab again at some point.

**Professional Development**

As an undergraduate, I did not have the opportunity to take Dr. Paul Miller's CHM 330 (Industrial Chemistry) course, and I very much enjoyed being able to sit in on that course during the Spring of 2010. I would like to continue sitting in on courses taught by my colleagues; not only to learn more course material in the field of chemistry, but also to continue to learn new teaching techniques and ways of presenting material. Other courses that interest me are Dr. Czerwinski’s CHM 403 (Advanced Organic Chemistry) course and the sophomore level inorganic chemistry course (CHM 231) that will debut in the Fall 2013 semester.
Service Narrative

Service to the Department - General Chemistry Laboratory Coordinator

My role as CHM 103 (General Chemistry I) Laboratory Coordinator is crucial to the success of the department, and it is a role that I enjoy and take very seriously. Each semester, I am responsible for the preparation of experiments for a large number of lab sections; the fall semester generally runs 24 lab sections and the spring semester generally runs 15 lab sections of 24 students each. One of my main responsibilities involves the recruitment, training, and oversight of lab preparatory students who assist me. In addition to this task, I am responsible for maintaining and monitoring the use of chemicals and supplies needed for each experiment and requesting reorders and restocking of those items as needed. I also monitor and make sure that wastes generated by the labs are handled properly and safely. Since one of the CHM 103 experiments is conducted in the Radiation Center in the basement of Cowley Hall, I must also coordinate and communicate with others that use this lab each semester. Finally, I also use my experience to help new CHM 103 lab instructors in any way that I can. I often demonstrate experimental set-ups, answer questions that they may have about the experimental procedure, and share my laboratory notes and student note taking sheets with them.

As laboratory coordinator, I have begun preparing a new and updated laboratory preparatory guide for each of the 12 CHM 103 experiments. This semester, I have had pictures taken of each of the experimental set-ups, as well as the placement of chemicals, equipment, and waste disposal containers in the lab. The guide will be updated to include the current preparation of chemicals, equipment, and supplies and the respective quantities needed for each lab section. This resource is something that will be extremely valuable when teaching new preparatory students how to prepare the lab. It will also be an important resource for the department to have on file so that everyone has access to the proper lab set-up if I am unable to set them up myself. Each time I get new preparatory students, I ask that they add information that they would find useful to these notes so that this resource can continue to be an improving work in progress.

Since taking on the position of General Chemistry I Laboratory Coordinator, I have used part of each of my summers to clean and organize the preparatory room for these labs. Decades of unused equipment, chemicals, and materials have been properly disposed of or redistributed for others to use. The equipment and chemicals in the preparatory area have been reorganized by experiment to ease the set-up and reordering of chemicals and supplies. Wastes generated from the labs are now being disposed of more quickly and efficiently and the work space in the preparatory room has been greatly increased as a result of this effort.

Service to the University - Academic Advising

I have helped with freshman registration the past two years and frequently have current and past students ask me advising-related questions. While no students are officially assigned to me for advising, I have thoroughly enjoyed helping students make important decisions about their courses and careers. I have also found that students feel comfortable coming to talk to me and that they value my advice and opinion on what might be the best route or opportunities for them. I will often have students that I had in General Chemistry come back to me semesters later for advice or periodically stop by my office to update me on how they are doing. However, it is the ultimate compliment and one of my greatest joys when a previous student says that he or she enjoyed having me so much before that he or she was excited to take me again. I try to provide
Service Narrative

Tanya J. Cordes

students with the same valuable advice that I was given as an undergraduate. I am very much interested in further impacting and guiding the incoming and continuing students at UW-L by increasing my involvement in these kinds of advising activities.

Service to Students - Letters of Recommendation

During the 2011-2012 academic year, I wrote twenty four letters of recommendation for students. I find this number to be quite impressive given that all of the letters were for acceptance to professional schools or programs, summer research opportunities, or scholarships. I believe that the number of letters requested and written speaks to my accessibility and degree of interaction with the students. I am genuine and honest with my students and I have not had to decline any requests for letters of recommendation because, for the most part, the students who have requested letters from me have been excellent, hardworking, and determined students. And since I know each student very well, I have a lot on which to comment in terms of their academic and laboratory abilities and their personal character. The success rate of these students in getting into their respective program, being accepted into a summer research program, or receiving a scholarship has been nearly 100%. In fact, I recently received a wonderful thank you letter from one of the faculty mentors whom a student worked for this past summer on what an exceptional job she did this past summer and how he would strongly support her application for graduate school.

Service to the Community - Science Fair Judge and Chemistry Magic Show Presenter

I have been involved with judging local science fairs for middle school children. I have judged projects at both La Crescent Middle School and the Gundersen Lutheran Science and Math Exposition held at the La Crosse Center. Both experiences made me realize how important it is to get young students excited about math and science. I believe the earlier one can inspire and interest a young person in science, the greater the likelihood of them remaining engaged and interested in these fields and further pursuing them in higher education. I know that I would not have ever considered a career in education or chemistry if I had not been inspired and encouraged by my undergraduate chemistry professors. I can only imagine the early impact some of those same professors would have had on me if I had been exposed to such experiences as a high school, middle school, or even elementary school student.

In fact, I have seen the excitement and inquisitiveness for chemistry that local elementary school children show at the annual Chemistry Magic Shows put on by the Chemistry Department. I started becoming involved in these magic shows when I was an undergraduate student and my enjoyment for them has only increased as I have learned more about chemistry and have become better at presenting. The students and accompanying teachers and adults all seem to take a lot away from the shows. The students are eager to find out what is happening in each demonstration and are enthusiastic about how chemistry can be used to answer all sorts of questions about things that they encounter in their daily lives. Personally, as an educator in chemistry, I believe that it is part of our job to educate people in the community about the joys, benefits, and safety of chemistry. I know that I have become a better communicator to the general public about what I do and teach in the classroom each day through my involvement in these shows.