My teaching philosophy is based on empathy, respect, and expectation. My students quickly realize that the learning experience is a joint effort. I eliminate the adversarial nature often encountered in high school. I am not “out to get” my students; I explain that this takes far too much energy. I strive to create an environment where students can share ideas without ridicule. Mathematics is one of the most feared and hated subjects. To fight against subject-prejudice, I find it helpful to “trick” my students into learning. I find conversing with students as class begins lightens the mood, and takes them out of their heads briefly. Often times I will tell a story of some past experience, or even what I did the past weekend. Students are then more relaxed and can focus without dread. I believe it is a combination of many of these intangibles that brought me the fortune of winning the Residence Life 2012 Outstanding Professor of the Year award.

I would love to share all of my experiences over the past three years, however due to constraints, I will limit myself to a small number. I believe my time at UW-L so far has changed me for the better. On reflection, I can recognize a shift in my attitude towards teaching. When I was a graduate student, I focused on the day-to-day class experience, trying to make my students learn material in a very standard and practiced way. Over the past three years, I have come to realize there is so much more to teaching than preparing a lecture. I am becoming more aware of how students learn, and how to accurately measure learning. I realize that course material need not come from a textbook, but often times can come from active research activities. I also realize that it is not me who drives the learning, but the students. In this narrative, I will describe several activities I have engaged in over the three years, and their impact on me and my students.

A concern of mine when I first arrived at UW-L was that of student assessment. With mathematics, especially introductory mathematics, skills must be developed. Typically such skills are developed through drilling via homework problems. Students will be asked to complete anywhere from 10 to 40 problems per week. In my first courses, I would assign, but not collect, such homework. I would assess student learning and skills through weekly quizzes. Although the students were expected to complete the assignments before the quiz, this often did not happen. I considered collecting and using homework as part of their course grade. The idea being that this would provide early feedback to aid in their self-assessment of learning.

However, the sheer number of students and problems made collecting homework problematic. I could not provide worthwhile feedback in a timely manner. Speaking to colleagues of mine, I was not alone in this predicament. I, along with Melissa Bingham and Ted Wendt of the mathematics department, proposed using an online homework system in our general education courses to determine if such a system would improve student learning. We proposed to use a system called WeBWorK. This online homework system provides randomized questions and provides immediate feedback to students. We wrote a Teaching Innovation Grant proposal in the spring of 2010 (funded for $1500) to investigate the effectiveness

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of WeBWorK in general education mathematics courses, specifically Elementary Statistics taught by Dr. Bingham, Applied Calculus taught by Dr. Wendt, and Calculus II taught by myself. We introduced WeBWorK into our courses, attaching a percentage of the course grade to homework. We compared the final exam means from the semester before without WeBWorK to the semester with WeBWorK. It was shown that the mean final exam score had increased for all three classes, and for Elementary Statistics and Calculus II the increase was statistically significant. We also included a student evaluation of WeBWorK. Students indicated through survey and free response that the immediate feedback was helpful and WeBWorK assisted in their understanding of the course materials. We presented our study at the MAA-WI Sectional Meeting (April 2011) and the Best Practices in STEM Teaching Conference (August 2011).

In analyzing the results of this study, we determined that the use of WeBWorK improved the average student, decreasing the number of D’s and F’s, and increasing the number of C’s and BC’s. The A and AB student will work problems assigned, regardless of their impact on grade. The average or below average student tend not to complete voluntary assignments. This was very encouraging. After this study, other faculty in the department began using WeBWorK.

WeBWorK is not a perfect system. It is free to both institution and student, which is what made it appealing to use. However, it has consistency issues that can make its use confusing to students. In addition, the problems for statistics included in WeBWorK were not nearly robust enough to allow for continued use. Once again, Drs. Bingham, Wendt and myself wrote a Professional Development Grant proposal (funded for $12,367.35) to develop a UW-L WeBWorK problem library. The first iteration of this library is to develop problems for Elementary Statistics, Applied Calculus, and Calculus I. We are currently underway, employing undergraduates to help write and test problems. Currently we are piloting the problem library in our courses. We hope to continue this project to include problems for courses such as College Algebra, Precalculus, and Calculus II. The continued development of WeBWorK will allow faculty in the department to benefit from the use of such an online homework system with the assurance of quality and consistency in the problems being assigned.

I challenge myself to find ways to integrate my research into teaching. Some ways are easier than others. My research is in the field of operator theory, a subfield of analysis. In the spring 2011 semester, I taught a senior level topics course, the topic I chose was an Introduction to Operator Theory. This is typically material not encountered by undergraduate students. Although I adopted a textbook designed for undergraduates, I added material typically included in beginning graduate courses. During that spring break I attended a conference on analysis and operator theory and the University of Florida. At that conference I had learned about several aspects of operator theory that were new to me. I returned and included some of these topics in my course.

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I have also had the opportunity to work with a colleague on a textbook. Dr. Matthew
Pons of North Central College (a friend of mine from graduate school) began writing an
undergraduate textbook in real analysis from course notes he has been developing for several
years. I was asked to develop the figures for this textbook, and have been involved in the
editing of the book for over a year now. This book is being published by Springer-Verlag,
and is being piloted at UW-L, North Central College, and at the University of Kentucky.

I believe my job as teacher does not exist solely to convey information in a classroom.
A great deal of work happens outside of class. One of the responsibilities I enjoy most about
this position is mentoring students in undergraduate research. I have had the pleasure of
working with the Wisconsin Alliance for Minority Participation (WiscAMP) program to
mentor freshmen and sophomore students in STEM fields. My first WiscAMP student was
Cassandra Jens. We started our collaboration in the Summer 2010 and continued through
the 2010-2011 academic year. She presented her work at the Summer Research Day here
at UW-L, and at the National Conference for Undergraduate Research (NCUR). My second
student was Tria Xiong, who I worked with this past summer. She also presented her work
at the Summer Research Day at UW-L.

Working with students in WiscAMP is a challenge. The idea of the program is to intro-
duce students to research in their first two years to retain students in the STEM fields. The
difficulty is finding a problem for the students that has not been studied, but is understand-
able and interesting. One such area which has many understandable problems is the field
of epidemiology. The idea of how diseases are spread is to some extent easily posed. The
mathematics used to study these problems can range from simple algebra to quite sophisti-
cated differential equations. To make things interesting, I proposed for Cassandra the study
of a zombie infection in a human population. First, the study of zombies is a pop-culture
metaphor for diseases that once contracted can not be cured. A paper is being written co-
authored by Cassandra, Dr. Ted Wendt, and myself on the work.

I have taken a big interest in the education of future mathematics teachers. I do not con-
sider myself a Mathematics Education faculty, but I do see myself playing a role in the
education of future teachers. With the advent of the national Common Core State Stan-
ards, mathematical modeling is a topic that all math teachers, current and future, will need
to be well-versed. To prepare students for this, Drs. Ted Wendt, Jenni McCool, Jennifer
Kosiak, and myself planned and hosted (through an OPID grant) a professional development
workshop on mathematical modeling for teachers in the spring of 2011. This workshop was
attended by local math teachers and UW-L math education majors to understand what
mathematical modeling is, and how to incorporate it into the classroom. At the end of the
workshop, a one credit course was offered for the math education students to further their
exploration of the topic. In addition, a one credit graduate course was offered to the cur-
rent teachers as professional development to implement the ideas of the workshop into their
classroom. Both courses were taught by myself, Dr. McCool and Dr. Wendt.

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I believe scholarship is an integral part of me becoming an exceptional educator. Staying active in research, including publishing papers and presenting at conferences and seminars, allows me to bring new research into the classroom (see my teaching narrative.) I have formed many collaborations within UW-L as well as outside. I believe this adds to the strength of my research. I have developed two areas of interest in my research. The first area is an extension of my dissertation work in the field of operator theory. The second area is in the field of mathematical biology. This area of research is new to me, and is developing into a firm research path with collaborations forming within the mathematics and biology departments.

Papers Published in Refereed Journals

- with F. Colonna, Weighted composition operators from \( H^\infty \) to the Bloch space of a bounded homogeneous domain. *Integral Equations and Operator Theory* 66 (2010), 21–40.

Papers Refereed for Journals

- Weighted composition operators from weighted Bergman-Nevanlinna spaces to some Bloch-type spaces in the unit polydisk, Taiwanese Journal of Mathematics.
- Weighted composition operators from Hardy space into logarithmic Bloch spaces, *Journal of Function Spaces and Applications*.
- Norms of some operators on bounded symmetric domains, *Journal of Applied Mathematics and Computation*.

Invited Talks

- Surviving an Outbreak of Zombiism, MCSP Lecture Series, Roanoke College, Roanoke VA, March 2012.
- Composition Operators: Something for Everyone, Mathematics Colloquium, George Mason University, Fairfax VA, March 2012.
• Surviving an Outbreak of Zombiism, Prime Time Mathematics Colloquium, North Central College, Naperville IL, October 2011.

Conference & Seminar Presentations

• American Mathematical Society (AMS)/Mathematical Association of America (MAA) Joint Mathematics Meeting
  – Multiplication Operators Between Lipschitz-Type Spaces on an Infinite Tree, New Orleans, LA, January 2011.
  – Weighted Composition Operators from $H^\infty$ to the Bloch Space of a Bounded Homogeneous Domain, San Francisco, CA, January 2010.

• MAA MathFest
  – Zombies, Ecology, and Epidemiology...Oh My!, Madison, WI, August 2011

• MAA-WI Sectional Meeting
  – Surviving an Outbreak of Zombiism, April 2012.
  – Isometries on the Bloch Space, April 2010.

• UW-L Mathematics Department Seminar
  – Multipliers on Lipschitz-Type Spaces of a Tree, September 2010.
  – Turing Instabilities in Reaction-Diffusion Equations, March 2010.
  – Isometries on the Bloch Space, February 2010.
  – Analysis on Discrete Structures, October 2009.

Conference Organization


• Organizer AMS Special Session, Operator Theory on Analytic Function Spaces, AMS/MAA Joint Mathematics Meeting, Boston, MA, January 2012.

Current Work

• Papers
  – Surviving and outbreak of zombiism, with Cassandra Jens (undergraduate student) and Theodore Wendt, in progress.
  – Weighted composition operators from the Bloch space to weighted Banach spaces of holomorphic functions on a bounded homogeneous domain, under review.

• Research Collaborations outside of UW-L
  – Composition Operators on Weighted Hardy Spaces, with Katherine Heller and Matthew Pons of North Central College.
  – Operators with Symbol on Trees, with Flavia Colonna of George Mason University and Glenn R. Easley of Systems Corporation.

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My service to date reflects my dedication to the students of UW-L (both current and future), as well as to my department and the university as a whole. I find it invaluable to understand how I fit into the university as a whole, and so my committee service has focused on issues concerning both faculty and students. The activities within my department have been selected to help me understand how best to educate students across the university, as well as move my department forward in its evolution. I fully believe that inspiring the future generation of students is a key feature of my job as well, so my community service is an integral part of my job.

**Department Service**

- **Search and Screen Committees** I assisted in the hiring for Assistant Professor of Mathematical Biology (2011-2012), and am assisting in the hiring for two Assistant Professors of Mathematics Education (2012-2013).

- **Mathematical Modeling Competitions** I assist in the organization of the regional Wisconsin Mathematical Modeling Competition (WWMC) and the universities participation in the international COMAP competition (2009-present). Such activities include planning space and meals for student competitors, organizing activities during the competition, mentoring teams, and judging student work.

- **Student Advising and Recruiting** I have participated in freshman orientation advising for mathematics (2010-present). I am also one of the mathematics department representatives at Campus Closeup, a program which invites prospective students to learn about UW-L and potential majors (2011-present).

- **Curriculum Committees** I have assisted in the determination of course and program curriculum within the department. I was a member of the Real Analysis curriculum committee charged with identifying course content in our two-semester sequence MTH 407 and MTH 408. I was also a member of the Secondary Teacher Education Program math curriculum committee. This committee developed the department requirements for the secondary math education major.

- **General Education Course Assessment Committees** I have assisted in the assessment of the general education learning objectives for Calculus I (2009, 2010) and Calculus II (2011). The committee devised common final exam questions and a rubric to assess student learning from these questions. In 2010 and 2011, I chaired the committees for the assessment of Calculus I and Calculus II.

- **Math Club Faculty Advisor** I organized activities and speakers for the math club. I invited Dr. David Taylor of Roanoke College to present to students on the Mathematics of Sudoku.

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University Service

- Undergraduate Curriculum Committee member (2012-present)
- ad hoc Academic Technology Committee member and recorder (2011-2012)
- LGBTIQQA Scholarship Committee member (2010-present)

Professional Service

- Conference Organizer I have organized a special session and a panel discussion for the major math conference, the AMS/MAA Joint Mathematics Meeting. For the 2012 conference, I organized a research special session titled “Operator Theory on Analytic Function Spaces.” For the 2013 conference, I am organizing a panel discussion titled “Active Learning in Mathematics.”

- Journal Referee I was invited to be a referee in operator theory and analysis for the Taiwanese Journal of Mathematics. To date I have refereed one paper for the journal.

- Math Reviews Author Mathematics Review is an electronic publication offering access to an easily searchable database of reviews, abstracts and bibliographic information for much of the mathematical sciences literature. I regularly write reviews of published journal articles in operator theory and analysis.

Community Service

- STEM Saturdays/Girls in Science/Boys Science Exploration Camp I developed and presented workshops for middle school girls and boys exploring the use of computer programming in movie production (Summer 2010, Fall 2010, Summer 2011), and a workshop exploring combinatorics and counting principles (Summer 2010).

Service Grants

- “Integrating Mathematical Modeling Opportunities Across High-School and College Curriculum”, UW System Grant–funded, co-pi with Jenni McCool (Mathematics) and Theodore Wendt (Mathematics).