GEORGIA SOUTHERN UNIVERSITY

Department of Physics
P.O. BOX 8031
STATESBORO, GEORGIA 30460-8064
TELEPHONE (912) 478-5292
FAX (912) 478-0471
http://cost.georgiasouthern.edu/physics/

To: Regents' Teaching Excellence Award Committee
From: Dr. Clayton Heller, GSU Physics Chair

May 8th, 2013

Dear Award Committee,

Please accept this letter of recommendation for Dr. Delena Gatch for the FY 2014 Regents' Teaching Excellence Award. I strongly support her application as I believe her to be a fantastic teacher and fully committed to all the areas of teaching research and development. This is supported by her being awarded the 2012 Georgia Southern University Award for Excellence in Contributions in Instruction, the 2010 Allen E. Paulson College of Science and Technology Award of Excellence in Teaching, and the 2010 Governor's Teaching Fellow.

Delena is an alumnus of the Georgia Southern Physics Department having graduated from here in 1995. She then went on to graduate school at the University of Georgia where she received her Ph.D. She then returned to in the physics department here as a Temporary Assistant Professor. Even though she had many other opportunities she chose to return to this department because of her love of teaching physics. She is now a tenured professor and a tremendous asset to the department and University.

Delena Gatch excels in teaching in all areas: in the classroom; improvement and development of teaching methods; development and application of learning assessment tools; Physics Education Research at local, regional, and national levels; and mentoring students in conducting such research. I will describe her activities in these many areas in more detail below.

Teaching in the Classroom

Delena is an excellent instructor by all measures that we employ. She consistently scores greater than 4.5/5.0 on the Overall Rating question in student ratings of instruction. We also use pre/post-tests such as the Force Concept Inventory test. This standardized test is designed to measure student learning outcomes in the subject area of Newtonian mechanics. Delena's students routinely show gains of 25% or more. In both her large lecture class and in our Studio Physics environment Delena is constantly modifying her approached based on assessment data she has collected from previous semesters. She is never satisfied and is always striving to develop her teaching methods.

Development of teaching Tools and Methods

Delena has initiated and directed the Studio Physics effort in the department. This technique, first begun in the mid-1990 at Rensselaer Polytechnic Institute, combines the lecture and laboratory introductory physics classes into a single seamless presentation. The focus of this teaching method is to coordinate the lecture and lab activities in an active, inquiry-based environment. Delena has further developed this model by introducing online homework systems, rotating 3-person student teams and the development of training materials for teaching assistants. Delena has been responsible for the training of new faculty and teaching assistants to the studio method. The payoff has been a three-fold increase in student success in our introductory physics classes.

Development and Application of Learning Assessment Tools

Delena has also led the effort to implement assessment of student learning across all introductory physics classes here in the department. Standardized pre and post testing to quantitatively measure student learning is administered to all students in introductory physics classes. Delena supervises the administration of these tests, then personally collects and analyses the entire data set. Delena has also pioneered the development of new assessment instruments that had not previously existed in the literature. Her work has not gone unnoticed, as she has been asked to join a small group of assessment specialists to review the assessment and action plans of all the departments in the University.

Physics Education Research

Physics Education Research (PER) has become an active area of physics research over the last decade. Physics departments at several well-known universities now have PER groups. Delena is the leader of such a group at Georgia Southern University. Furthermore, she has been actively conducting research here in the department which has led to invited talks at national meetings and numerous publications in refereed journals. Delena also collaborates with well-respected scholars in the PER field, such as Dr. Beichner of North Carolina State University, who originated the SCALE-UP project.

Mentoring Undergraduate Students

Delena has also been active in involving undergraduate students in her PER activities. She has set up a PER lab where she and her students have the computer and other resources dedicated to PER research. This has led to some of our Physics majors considering careers in teaching physics at the high school level. To further the department as a generator of physics teachers, she helped design a Physics BA degree specifically for this purpose. This degree, which now sits alongside our BS degree, has a balanced mix of physics, astronomy and education courses to prepare students for a teaching career.

I strongly recommend Dr. Delena Gatch for the Regents' Teaching Excellence Award. Her leadership has been an essential driver for the gains in student learning in the department and is a role model for all instructors in the University.

Sincerely,

Clayton Heller

Dr. Clayton Heller
Physics Department, Chair
Planetarium Director
Georgia Southern University
cheller@georgiasouthern.edu

GEORGIA SOUTHERN UNIVERSITY

CENTER FOR TEACHING, LEARNING AND SCHOLARSHIP
POST OFFICE BOX 8143
STATESBORO, GEORGIA 30460-8143
TELEPHONE (912) 478-0049
FAX (912) 478-0090

May 7, 2013

Dear Members of the Teaching Excellence Awards Committee,

It is my privilege to recommend to you Dr. Delena Gatch for the "Regents' Teaching Excellence Award." Dr. Gatch and I have worked closely together for more than four years on a variety of Scholarship of Teaching and Learning (SoTL) projects. In addition to presenting together at two invited University System of Georgia (USG) workshops, we are also both members of the Georgia Southern SoTL Travelers and have presented at numerous universities statewide. No matter where she presents, Dr. Gatch is always effective in motivating others and typically ends up answering more audience questions than any of the other Travelers. Not only does she regularly seek to update her knowledge of physics and physics teaching, she also serves as a role model for others in this regard. For example, at a USG seminar on Teaching Large classes we attended—remember, we were there to learn from the presenters—Dr. Gatch was asked to model an activity related to electrical charges. Without hesitation and *without preparation*, she delivered an awesome lesson to non-physics faculty using scotch tape to "collect" electrical charges while modeling best practices in facilitating discussions that promote understanding.

Impressive as this "off the cuff" lesson was, even more impressive is Dr. Gatch's skill as an instructor in her own classroom. When I visited her Physics Studio class, she began class by reviewing the previous lesson and by having students solve a Snell's Law problem. While students worked in small groups, Dr. Gatch circulated around the room, joking with students and checking for understanding. Once she was sure students' understood the concept and had mastered the mathematics involved, she then turned off the lights and had students gather around a laser beam display, where she demonstrated how the beams changed directions as they passed through a clear material. By engaging students in this way, she had no problem introducing them to the underlying mathematics of refraction and reflections and even challenged students to think about how to get 100% internal reflection. She also explained the importance of internal reflection in applications likes fiber optics and used an everyday example—the difference in sparkle between a diamond and a cubic zirconium—to help students understand the concept. As students tried to solve yet another complex mathematical problem, Dr. Gatch again circulated around the room, answering questions and checking on students' work. Although students were sitting at tables in front of computers, no one was off task and I heard several students discussing the impact of air vs. material composition on a light beam. When one group finished early, Dr. Gatch invited group members to "play" with the lasers, to which one student replied "You can't have too much fun in physics!" What made this class even more special is that it is a physics course designed for non-majors and almost half the class members are females. Dr. Gatch makes learning physics enjoyable by making real world connections which appeal to both males and females, and by giving students confidence in their ability to do challenging work. She actually had them convinced that learning physics is easy!

I have been observing and evaluating classes for more than two decades and it is refreshing to see the current research in teaching and learning so skillfully and aptly applied. It is without reservation that I recommend Dr. Gatch to you for the "Regents' Teaching Excellence Award."

Sincerely,

Dr. Judith Longfield

Dr. Judith Longfield
Center for Teaching, Learning and Scholarship
P.O. Box 8143
Georgia Southern University
Statesboro, GA 30460
912.478.0078
jlongfield@georgiasouthern.edu

Curriculum Vitae

Delena Bell Gatch

Education:

Ph.D. in Physics, University of Georgia, December 2000.
B.S. in Physics (*Summa Cum Laude*), Georgia Southern University, December 1995.

Employment:

Associate Professor, Department of Physics, Georgia Southern University, 2011 to present.
Assistant Professor, Department of Physics, Georgia Southern University, 2006- 2011.
Temporary Assistant Professor, Department of Physics, Georgia Southern University, 2001-2006.
Post-Doctoral Research Assistant, Department of Physics and Astronomy, University of Georgia, Fall 2000.
Graduate Assistant, Department of Physics and Astronomy, University of Georgia, 1996-2000.
Undergraduate Research Assistant, Department of Physics and Astronomy, University of Georgia, Summer 1995.
Undergraduate Teaching Assistant, Department of Mathematics, Georgia Southern University, 1993-1995.

Honors and Awards:

Georgia Southern University Award for Excellence in Contributions in Instruction, 2011-2012
Allen E. Paulson College of Science and Technology Award of Excellence in Teaching, 2009-2010
Governor's Teaching Fellow, 2009-2010
Sigma Pi Sigma, Inducted May 1995
Phi Kappa Phi Honor Society, Inducted May 1995
Golden Key National Honor Society, Inducted May 1995
Gamma Beta Phi Honor Society, Inducted April 1993

Professional Affiliations:

South Atlantic Coastal Section of the American Association of Physics Teachers, President Elect, 2013-2014
American Association of Physics Teachers
Southeastern Scholarship of Teaching and Learning Colloquy
American Physical Society

Publications (last five years):

Trent W. Maurer, Deborah Allen, Delena Bell Gatch, Padmini Shankar, and Diana Sturges, "Students' Academic Motivations in Allied Health Classes," Journal of Allied Health Sciences and Practice, Volume **10**, Number 1 (January 2012).

Delena Bell Gatch, "Restructuring Introductory Physics by Adapting an Active Learning Studio Model," International Journal for the Scholarship of Teaching and Learning, Volume **4**, Number 2 (July 2010).

Delena Bell Gatch, "Book Review: Terry Doyle's Helping Students Learn in a Learner-Centered Environment," International Journal for the Scholarship of Teaching and Learning, Volume **3**, Number 1 (January 2009).

Delena Bell Gatch, **Test Item File for College Physics Wilson Buffa Lou**, Pearson Prentice Hall, Upper Saddle River, NJ, 7th Edition (2009), 6th Edition (2006).

Delena Bell Gatch, **Test Item File for Physics Walker**, Pearson Prentice Hall, Upper Saddle River, NJ, 4th Edition (2009), 3rd Edition (2006).

Delena Bell Gatch, **Test Item File for Physics for Scientist and Engineers with Modern Physics Giancoli**, Pearson Prentice Hall, Upper Saddle River, NJ, 4th Edition (2008), 3rd Edition (2005).

Presentations (last three years):
Delena Bell Gatch, "Creative Exercises in Introductory Physics," 2013 Summer Meeting of the American Association of Physics Teachers, Portland, OR, July 2013

Krystal Ramos and Delena Bell Gatch, "Utilizing Creative Exercises in High School and College Physics Courses," 2013 Spring Meeting of the South Atlantic Coastal Section of the American Association of Physics Teachers, Gainesville, GA, April 2013.

Delena Bell Gatch, Michelle Cawthorn, and Joy Darley, "Effects on Teaching of an Intensive Summer New Faculty Workshop," 2013 Scholarship of Teaching and Learning Commons Conference, Savannah, GA, March 2013.

Deborah Allen, Diana Sturges, Trent Maurer, Delena Bell Gatch, and Padmini Shankar, "Student Academic Motivations in a Graduate Nursing Program," 2013 Scholarship of Teaching and Learning Commons Conference, Savannah, GA, March 2013.

Delena Bell Gatch, Michelle Cawthorn, and Joy Darley, "Effects of an Intensive new Faculty Workshop on Teaching," Second Annual Georgia Scholarship of STEM Teaching and Learning Conference, Statesboro, GA, March 2013.

Colleen Beyer, Thomas Koballa, Delena Bell Gatch, Leslie S. Jones, Sharmista Basu-Dutt, and Farooq Khan, "Research Participants Discuss STEM Conference Participation and Impact on Thinking and Practice," Second Annual Georgia Scholarship of STEM Teaching and Learning Conference, Statesboro, GA, March 2013.

Delena Bell Gatch, "Trig-Based Physics Students: Who are they? Why are they taking Physics? What are their strengths and weaknesses? How can we better serve them?," 2012 Spring Meeting of the South Atlantic Coastal Section of the American Association of Physics Teachers, Athens, GA, April 2012.

Delena Bell Gatch, "Exploring the Impact of Studio Courses on Student Learning," First Annual Scholarship of STEM Teaching and Learning Conference, March 2012.

Trent Maurer, Deborah Allen, Delena Bell Gatch, Padmini Shankar, and Diana Sturges, "Students' Academic Motivations in Three Disciplines," 2012 Scholarship of Teaching and Learning Commons, March 2012.

Trent Maurer, Deborah Allen, Delena Bell Gatch, Padmini Shandar, and Diana Sturges, "Students' Academic Motivations in Three Disciplines," Annual Research Day of Mu Kappa Chapter of Sigma Theta Tau International Honor Society at Georgia Southern University, March 2012.

Delena Bell Gatch, Trent Maurer, Diana Sturges, Padmini Shankar, and Deborah Allen, "Non-Science Majors Academic Motivation in Science Courses," 2011 Fall Joint Meeting of the North Carolina Section and South Atlantic Coastal Section of the American Association of Physics Teachers, November 2011.

Delena Bell Gatch, "Using Technology in the Sciences," Keynote Address for Promoting Student Success Through Technology Based Assessment at Louisiana State University, April 2011.

Trent Maurer, Deborah Allen, Delena Bell Gatch, Padmini Shankar, and Diana Sturges, "Students' Academic Motivations in Allied Health Classes," 2011 Scholarship of Teaching and Learning Commons, March 2011.

Delena Bell Gatch, "Conversion to Guided Inquiry Laboratories in Introductory Physics Courses," 2011 Winter Meeting of the American Association of Physics Teachers, January 2011.

Krystal Ramos and Delena Bell Gatch, "The Constructs of Positive Attitude," 2011 Winter Meeting of the American Association of Physics Teachers, January 2011.

Krystal Ramos and Delena Bell Gatch, "Finding the Roots of a Positive Attitude toward Learning Physics," 2010 Scholarship of Teaching and Learning Commons, March 2010.

Workshops Conducted (last three years):
Delena Bell Gatch, "Designing Courses for Significant Learning: How to Excel at Teaching and Learning," Workshop for New Faculty Entering into the College of Science and Mathematics at Georgia Southern University, Summer 2013.

Delena Bell Gatch, Michelle Cawthorn, and Joy Darley, "Filling Up Your Pedagogical Toolbox: How to Excel at Teaching and Learning," Workshop for New Faculty Entering into the College of Science and Mathematics at Georgia Southern University, Summer 2012.

Laura Frost, Delena Bell Gatch, Judith Longfield, and Diana Sturges, "Scholarship of Teaching and Learning: Impact in the Classroom and Beyond," Workshop for University System of Georgia Faculty Development Series, March 2011.

Delena Bell Gatch, Lorraine Gilpin, Judith Longfield, and Trent Maurer, "Scholarship of Teaching and Learning: What? Why? When? Where? Who?," Workshop at Southern Polytechnic State University, March 2011.

Laura Frost, Delena Bell Gatch, and Trent Maurer, "Scholarship of Teaching and Learning: Inquiring into Learning," SoTl Symposium of the South, October 2010.

Delena Bell Gatch, Lorraine Gilpin, Judith Longfield, and Diana Sturges, "Scholarship of Teaching and Learning: Inquiring into Learning," Workshop at Savannah State University, Savannah, GA, April 2010.

Laura Frost, Delena Bell Gatch, Trent Maurer, and Diana Sturges, "Scholarship of Teaching and Learning: What? Why? When? Where? Who?," Seminar Hosted by Georgia Southern University's Center for Excellence in Teaching for Faculty Developers and Administrators from other Universities in the Southeastern United States, Statesboro, GA, January 2010.

Reflective Statement on Teaching Strategies and Objectives

Delena Bell Gatch

While at Georgia Southern University, I have enjoyed a wide range of teaching experiences including teaching classes, advising and mentoring research students, developing new courses, implementing new pedagogical techniques, and designing new curriculum and assessment materials.

Having taught a variety of courses including orientation courses for freshmen, introductory freshman and sophomore level physics service courses, advanced courses for physics majors, and graduate courses for pre-service and in-service teachers; I have found each of these courses demand very different teaching strategies. One of the core principles of my Philosophy of Teaching (See attached statement) is teaching encompasses much more than just delivering information in the classroom and administering exams. True teaching requires the development of a fertile learning environment in which students can be held to high academic expectations and required to take responsibility for their own academic success. To develop this fertile environment I have found it best to assess student learning (See attached Evidence of Personal Student Learning) and attitudes and revise my teaching strategies based on analysis of the assessment.

Additionally, assessment has extended beyond the students in my own classes to include students in each of the introductory courses offered in the department (See attached Evidence of Departmental Student Learning). To accomplish this, I coordinate the pre/post assessment of conceptual physics content knowledge and student attitudes toward learning physics in all introductory courses. Throughout this department assessment project, I have recently mentored multiple undergraduate physics majors interested in careers in physics education. Analysis of this data has allowed each of the faculty members in the department to assess their own teaching strategies. As a department, this has afforded the opportunity to openly discuss and compare student learning outcomes among the various teaching methods used across the department. Over the last academic year, my involvement in assessment has extended beyond my own department to encompass multiple departments across three colleges on campus. I have assisted programs in revising program learning outcomes, selecting/developing measures of student learning, and reflecting on the data to maximize student learning.

Initially, I primarily taught introductory freshman and sophomore level physics courses. Each of these courses followed the traditional lecture and laboratory course format typical for higher education. Reading assignments and homework problem sets were both assigned; however, few students completed the assignments since they were not graded. Students' grades were based entirely on their performance on in-class exams and a comprehensive final exam. Since exams were my only means of assessment, I evaluated students' success on important topics by recording each student's score on each exam problem in a spread sheet. This item analysis identified those areas on which the class did poorly as a whole. Based on this analysis, I revised my teaching strategies for the next semester. Early in my teaching career, these revisions simply included rewriting portions of my lectures for the next semester. I have continued to use this item analysis, as I have found it to be effective in evaluating my teaching strategies. Currently this analysis guides my selection of student centered activities for the next semester.

In an effort to improve student learning, I began investigating online homework systems for introductory level physics courses. The online systems enabled me to encourage students to complete the homework in concurrence with the lectures. Students also received immediate feedback while completing assignments in a timely manner. Due to my successes with the online homework systems, the department chose an online homework system for adoption. In addition, I currently serve as a national faculty advisor for the MasteringPhysics online course management system. As a faculty advisor, I am available to relate success stories, share best practices, and provide tips for successfully integrating online technology into the physics curriculum with colleagues at other institutions across the country. I have also become actively involved in editing and writing introductory physics content for MasteringPhysics.

Despite my efforts to further engage students outside of the lecture environment by using online systems, I became dissatisfied with lecture as the primary means of instruction. I also became dismayed with the student learning environment in the traditional laboratory courses. Beginning in the Fall of 2006, I spearheaded the effort to convert introductory lecture and laboratory courses in my department into a new single course format known as studio physics in the physics education literature. Studio courses seamlessly integrate the lecture and laboratory courses into a single class period where much of the time is devoted to student-centered, inquiry-based learning. With support from PRISM and ASPIRES grants funded by National Science Foundation, I developed instructional materials for the newly formatted introductory courses focusing on guided inquiry and supplemental instruction. An emphasis was placed on replacing traditional lectures with interactive, technology enriched class periods designed around the various learning styles. I created new teaching materials so that old laboratory assignments, previously very "cook-book" in nature, could be replaced with new inquiry based laboratories relying on web-based computer simulations and computer interfaced laboratory apparatus. I now use online computer simulations in addition to hands on inquiry-based laboratories to reinforce the concepts presented in mini-lectures. I also incorporated the use of classroom response systems and online homework systems into the studio model. Assessment indicated students enrolled in the studio physics courses experience greater success in achieving the desired learning outcomes for introductory physics courses. Students in my studio physics courses demonstrated a better understanding of physics concepts than their peers enrolled in my traditional lecture courses. DFW rates for my studio courses were also lower than for my traditional lecture courses. Through a gradual transition, the department has incorporated my teaching strategies for the studio model, and as of fall 2009 the transition of all introductory physics courses to the Studio format was complete.

During the spring semester of 2007, I taught a graduate course entitled Studies in Physics for Secondary Teachers. Pre-service and in-service teachers from the surrounding school districts who were working on their Masters in Science Education enrolled in the course. This course required teaching strategies that were very different from the introductory physics courses I was accustomed to teaching. I was able to place much less emphasis on encouraging students to complete reading and homework assignments. Instead, a strong emphasis was placed on a capstone project. As a final project, each of the teachers developed a unit for either a high school physical science or physics course. The units were required to included pre/post assessment exams, inquiry based laboratory activities, and computer simulation activities.

In continuing my service to area teachers, during the summers of 2007, 2008, and 2009 I teamed with colleagues from the Chemistry Department and the College of Education to develop and conduct summer workshops for pre-service and in-service teachers. These workshops were designed to improve teachers' physical science content knowledge while focusing on hands on activities, integration of computer simulations, and guided inquiry laboratory exercises. I have also assisted faculty from the College of Education in developing the new Area F Physical Science course for future early childhood and middle grades teachers. I assisted colleagues in selecting laboratory equipment for the course that would encourage future teachers to incorporate inquiry based exercises into their classrooms.

During the 2008 calendar year, Georgia Southern University was selected to participate in the new state online Master of Arts (MAT) in Teaching in Science and Mathematics franchise program. Due to my previous work with pre-service and in-service teachers, I was tasked with developing two new online physics courses (Physics for Teachers: Mechanics and Thermodynamics and Physics for Teachers: Waves, Electricity, and Magnetism) in support of Georgia Southern University's participation in the new state online Master of Arts (MAT) in Teaching in Science and Mathematics franchise program. These courses were developed specifically to prepare future teachers in the content necessary to pass the Georgia Assessment for the Certification of Educators exam in physical science and physics and to prepare future teachers to teach the content contained within the Georgia Performance Standards in physical science and physics.

I was granted the opportunity to begin teaching advanced courses for our undergraduate physics majors in the spring of 2008. These courses challenged me to once again rethink my teaching strategies. My focus became adequately preparing my students for the challenges of graduate school. While some methods in delivering these courses followed those of my freshman and sophomore level courses, I wanted to begin to require some additional assignments which broaden the student's horizons beyond the topics covered in class and which begin to incorporate the students into the larger learning environment available through activities within the physics department. In the traditional aspect of my classes, students were responsible for reading each chapter in the textbook and preparing an outline of the chapter due at the beginning of the class period. Students were also assigned homework problems from the end of each chapter for a grade. To move beyond the traditional teaching methods and to explore topics outside those discussed in the classroom, I required students to complete two research projects on topics related to modern physics. Each project required students to research the topic, prepare a research paper, and present their topic in class. To further introduce students to the larger world of physics, I required them to attend four departmental colloquiums during the semester and to submit a summary of the colloquium presentation the following class period.

During the fall of 2012, I taught my first class with an enrollment of greater than fifty students. I taught introductory freshman physics to a class of two-hundred students. These students met as a single group for three hours per week, spread over two class periods, in a large lecture environment. They also met for one hour in groups of fifty three days a week for conducting small group activities utilizing computer interfaced lab equipment, computer simulations, and problem solving drill activities. I was responsible for increasing the number of laboratory activities from 15 per semester to 45 activities per semester. It was a challenge to maintain Georgia Southern's classic "small-feel" classroom in this course. This past Spring semester, I introduced a Service Learning component into this course. The response from the enrolled students was overwhelmingly favorable. The Service Learning Project dramatically increased students' perception of real world application of physics concepts. I am currently working to flip this classroom for the next academic year. I look forward to the challenge of teaching new courses in the future as well as using experiences from course previously taught to improve upon them.

During the summer of 2012, I was given the opportunity to work with two colleagues to develop and lead an intensive month long workshop for faculty new to the College of Science and Mathematics on campus. The goal of the workshop was to guide faculty through the process of course development while equipping participants with an appropriate pedagogical toolbox for creating student centered classrooms. I am looking forward to once again mentoring new faculty this summer during this workshop experience.

My professional service to textbook publishers is also an important portion of my teaching duties. Over the last five years, I have reviewed multiple Prospectus and Table of Contents for new physics textbooks and edited numerous textbook manuscripts. I have also published six Test Item Files to accompany introductory level college and university textbooks (see Vita for complete listing). In the spring of 2008, I was invited by Pearson Publishing to serve as a faculty advisor for the MasteringPhysics online homework system. As a faculty advisor, I am available to relate success stories, share best practices, and provide tips for successfully integrating MasteringPhysics into the physics curriculum with colleagues at other institutions across the country.

As a teacher, I have truly enjoyed incorporating various teaching methods and evaluating different aspects of students learning and performance to create a dynamic learning environment in which students can be held to high academic expectations each semester. I appreciate Georgia Southern University's mission of "faculty's dedication to excellence in teaching and the development of a fertile learning environment exemplified by a free exchange of ideas, high academic expectations, and individual responsibility for academic achievement." I have found teaching, exploring the concepts of teaching, and sharing my experiences with others to be the most rewarding portions of my career.

May 9, 2013

To Whom It May Concern,

Dr. Delena Bell Gatch has been and continues to be my mentor. As my mentor she has been an active part in my academic career and personal growth for the past five years. It was Dr. Gatch who gave me such a love for physics in my freshman year that I changed my major from engineering to physics; a decision I have been grateful for ever since. She was a fantastic support system in the four courses I took with her my first two years as an undergraduate Physics major and continued to show her commitment to me, as with all her students, once I was no longer in her courses.

I could not ask for more in a teacher. If ever I needed help with something personal or making sure I was taking the proper courses to finish my degree in a timely manner she was there to support me. If there was ever confusion about course requirements she went the extra mile to research what information was necessary to find the answer I needed. Even as I have continued past my Bachelors of Science in Physics to my Masters of Arts in Teaching, she has been a great help in providing advice and materials to create a successful active learning environment for my own Physics students. Even though we are teaching on two different levels, she University and I High School, she has helped me adapt her concepts into something that will work for a less rigorous course.

Dr. Gatch's commitment to teaching is evident in the continuous readings and research she does to find more effective active learning strategies for her introductory Physics courses. Some of the strategies she uses are group problem solving, functioning simulations, and inquiry-based labs. In the inquiry-based labs we learned a concept at the beginning of our three hour class period, were given the goal of proving the concept, and a box of materials to do this with. In her own research she has proven that the inquiry-based labs are more effective than "cook book" labs, therefore making a significant difference in what students learn about the content. She was the head of the initiatives to bring Pearson's Mastering programs to campus in the main sciences, as well the concept of "Studio" courses to the introductory Physics courses. Studio Physics is a union of lecture and lab courses into one, taught by the same instructor.

One of Dr. Gatch's primary goals in finding, and testing, various active learning strategies was to improve students' ability to learn physics. This new found ability to learn would then reflect in their grades and confidence with the content that then cultivates into a love of the science.

Dr. Delena Bell Gatch is a fantastic candidate for FY2013 Georgia University System Teaching Excellence Awards. If you have any questions please feel free to contact me by phone (770-598-9045) or by email (ramos.krystal89@gmail.com).

Sincerely,

Krystal M. Ramos

Krystal M. Ramos, BSP

May 12, 2013

To Whom It May Concern,

Dr. Delena Bell Gatch has been my teacher, advisor, and mentor since August 2008. She was my physics professor for my first two years at Georgia Southern University. She championed Introductory Studio Physics at Georgia Southern. Studio Physics is an amalgamation of physics lecture and lab courses. This system improved the basic lectures with separate labs routine. She introduced Pearson's Mastering program at Georgia Southern. This program allows the teacher to assess the students understanding and problem solving ability so it can be addressed at the next class meeting.

In class, the students performed inquiry based labs, used computer based simulations to understand advanced topics, and used small group sessions to help the students further understand ideas. For labs, she sets out the materials and gives the students an outline of what they should find. The students then use small groups and their collective intuition to find the optimum setup for the equipment in order to measure what they need to determine. The computer simulations allow the students to visualize movement while looking at graphs of force and energy. The small groups encourage each student to participate in class. They complete the labs, computer simulations, and solve problems in these groups.

Every time I walk by Dr. Gatch's office she is talking to a group of students about physics or what classes they should take. I always take the opportunity to stop and talk to her for a few minutes about school and life in general. When I was trying to decide if I should go to graduate school, she suggested to me what questions I should ask and encouraged me to apply to schools that were a good match for me.

Dr. Gatch embodies the requirements of the USG Teaching Award. She is actively committed to teaching. She uses active learning strategies in her classroom every day. She helps her students outside the classroom whenever possible.

Sincerely,

Tyler Danley, BSP
tyler_w_danley@georgiasouthern.edu

Philosophy of Teaching

Delena Bell Gatch

Delivering information in the classroom, administering exams, and evaluating student achievement are necessary, superficial acts of teaching which most teachers can perform. However, the outstanding teacher knows the value of developing a fertile learning environment in which students can be held to high academic expectations and required to take responsibility for academic success.

I have found the most difficult task in teaching physics is creating a fertile learning environment. Many students difficulty with physics is primarily a psychological one. It is necessary to remain sensitive to the fact many students view physics as a hard subject, while conveying to students I have high expectations and require them to take responsibility for their achievements. Student responsibilities are clearly stated on my syllabus and discussed in detail on the first day of class. I convey to students my belief that learning is an equal partnership between the student and the professor, and I treat my syllabus as a contract towards fulfilling our mutual responsibilities for academic success. All of this cultivates the type of fertile environment I believe is necessary for students to be successful.

It is essential to evaluate the students' level of mathematics preparation and understanding of physics in order to develop a baseline for instruction. I administer various pre-assessments, depending on the course, to assess students' preconceptions about physics and attitudes toward learning physics. Based on the learning styles and needs of individual students, each class takes on a culture of its own. Classroom instruction must be adapted for the particular culture of each section; flexibility is an essential trait in teaching.

Lectures and in-class activities should introduce concepts in a fashion that conveys excitement. Students should not be intimidated by the presentation; overwhelmed students will not learn. Since physics courses are problem oriented, I place as much emphasis on solving problems as I do on presenting the concepts. Throughout a single class period, I engage students in multiple activities including mini-lectures, computer based simulations, inquiry based laboratories, and group problem solving drills. This practice engages their thought process and focuses their attention.

Students must become actively involved and responsible for their own academic success. Expectations of student performance and accomplishments should be clear at all times, thus my grading policy is clearly stated in my syllabus. I inform students it is not my policy to curve or bracket grades, so they will always be able to calculate exactly where they stand in the course.

Before returning a set of exams, I perform a full item analysis for the exam. This exam analysis allows me to statistically determine the strengths and weaknesses of the material being tested. I then use this information to adjust my areas of focus for the next semester. This means of evaluating my teaching methods aids me in developing very specific teaching strategies.

Working with students is both challenging and rewarding. I look forward to the opportunities that await me in the classroom each day. I consider each student to be an individual with special needs as well as definite strengths. Although the main responsibility for learning must always lie with the student, my goal as a teacher is to provide a fertile learning environment in which students can be held to high academic expectations while guiding them along a path to learn and appreciate physics.

In summary, there is nothing more satisfying than realizing you have impacted the life of a student. The quote below was taken from a note written by a student after the summer semester of 2003: "I just wanted to share one last thing with you…This time about 5 weeks ago, I was one scared girl!! I was so stressed out because I knew I had an unbelievable weight on my shoulders…Well, I decided from day one that I was going to study harder, be more determined, and work harder than anyone ever had here at GSU because I was going to succeed whatever it took! Wow… what a ride it's been! You will never understand what I've learned this summer – I mean not just academics but about myself and life in general and you will never ever understand just how much you have impacted and made a difference in my life!"

Evidence of Personal Student Learning In Introductory Physics Courses Measured by Gains** on the FCI* (Physics I) and CSEM** (Physics II)

Semester	Course	Section	Gains	
			FCI	CSEM
Spring 2012	PHYS 1111	A	0.37	
Fall 2011	PHYS 1111	A	0.26	
	PHYS 1112	A		0.39
Spring 2011	PHYS 1111	A	0.28	
Fall 2010	PHYS 1111	A	0.29	
Summer 2010	PHYS 1111	A	0.27	
Spring 2010	PHYS 1111	B	0.20	
Fall 2009	PHYS 2211	A	0.48	
	PHYS 2212	A		0.29
Spring 2009	PHYS 2212	A		0.40
Fall 2008	PHYS 2211	B	0.41	
Spring 2008	PHYS 2211	A	0.31	
	PHYS 2212	A		0.24
Fall 2007	PHYS 2211	E	0.28	
	PHYS 2211	C	0.33	
Spring 2007	PHYS 2212	B		0.18
	PHYS 2212	D		0.26
Fall 2006	PHYS 2212	C		0.19
	PHYS 2212	D		0.24
Summer 2006	PHYS 1112	A		NA
Spring 2006	PHYS 1111	C	0.13	
	PHYS 1111	F	0.11	
	PHYS 1111	A	0.11	
	PHYS 1111	D	0.12	
Fall 2005	PHYS 1111	B	0.28	
	PHYS 1111	C	0.32	
	PHYS 2212	C		NA

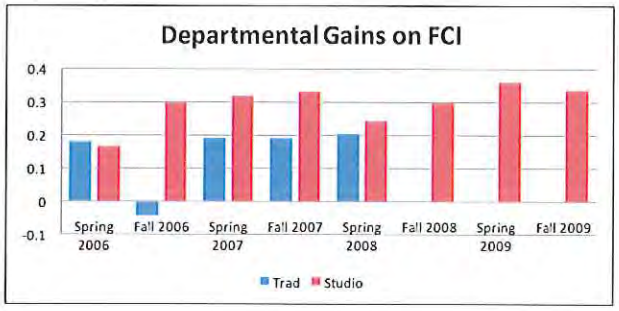
* Force Concepts Inventory

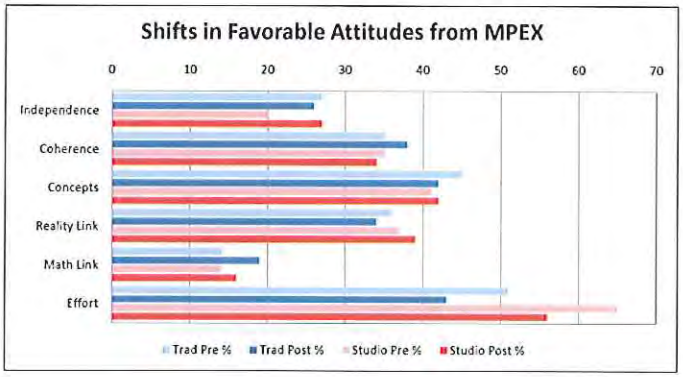
** Conceptual Survey of Electricity and Magnetism

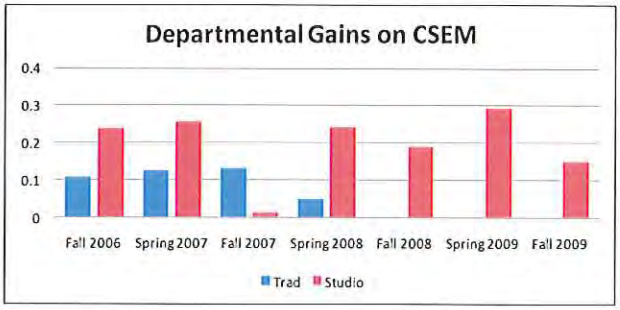
*** Gains = (Post Score - Pre Score) / (100 - Pre Score)

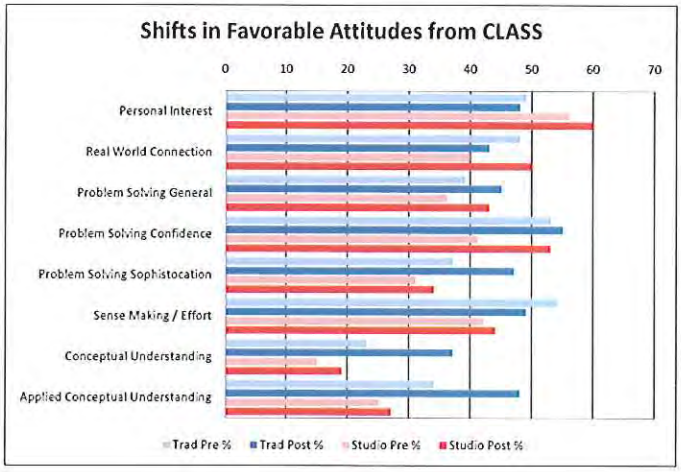
Evidence of Departmental Student Learning In Introductory Physics Courses

*graphs taken from publication: Delena Bell Gatch, "Restructuring Introductory Physics by Adapting an Active Learning Studio Model," International Journal for the Scholarship of Teaching and Learning, Volume **4**, Number 2 (July 2010









Contributions to Teaching and Learning

Delena Bell Gatch

Fellowships and Honors:

- Georgia Southern University Award for Excellence in Contributions in Instruction, 2011-2012
- Allen E. Paulson college of Science and Technology Award of Excellence in Teaching, 2009-2010
- Governor's Teaching Fellow, 2009-2010

Contributions at the Departmental Level:

- Restructuring introductory trigonometry-based physics courses
  - Lecture course capacity increased from 40 students to 200 students while retaining GSU's "small-feel" classroom environment
    - Developed Conceptual Worksheets and Creative Exercises (funded by NSF grant, 2012) for collaborative in-class activities/assessment
  - Laboratory meetings increased from once a week (15 per semester) to two times a week (30 per semester)
    - Developed many new laboratory activities
- Spearheaded departmental conversion of introductory calculus-based physics lecture and laboratory courses into studio courses
  - Introduced many new modern educational technologies to department: web based computer simulations, computer interfaced laboratory equipment, online homework system, classroom response system, and Scantron scanner equipped with ParScore
  - Developed supplemental instruction materials (funded by NSF-ASPIRES grant, 2007-2008)
  - Developed guided inquiry materials (funded by NSF-ASPIRES grant, 2007-2009)
  - Provided faculty training for existing faculty; Continue to train incoming physics faculty
- Developed 3 online courses
  - 1 for GSU's Online General Studies Program
    - Introduction to Physics I with Laboratory
  - 2 for the Board of Regents Master of Arts in Teaching in Science and Mathematics franchise program
    - Physics for Teachers: Mechanics and Thermodynamics
    - Physics for Teachers: Waves, Electricity, and Magnetism
- Departmental Assessment Coordinator
  - pre/post test all students enrolled in introductory physics sequences (PHYS 1111, PHYS 1112, PHYS 2211, PHYS 2212) for both conceptual understanding of physics and favorable attitudes toward learning physics
- Academic advisor for all students seeking a Bachelor of Arts with major in Physics degree
- Mentoring/Mentored 5 undergraduate research students
  - Kyle Mahoney, Physics Major
    - Project: "Impact of Peer Recommendations on Students' Study Habits and Academic Performance"
  - Daniel Cistola, Physics Major
    - Project: "Implementing Service Learning in an Introductory Physics Course for Non-Majors"
    - Certified as a Service-Learning Student Facilitator
  - Jessica Meghan Lang, Physics Major

        - Project: "The Computer Age: How It Affects Students' Understanding of Mechanics"
        - Recipient of ASPIRES Student Research Award
    - Krystal Ramos, Physics Major
        - Project: "Finding the Roots of a Positive Attitude Toward Learning Physics"
        - Recipient of ASPIRES Student Research Award
        - Oral conference presentations at international, national, and regional conferences
    - Wendie Stripling, Physics Major
        - Project: "Assessing Introductory Physics Courses at Georgia Southern University"
        - Oral presentation at departmental colloquium and poster presentation at college advisory board meeting
- Mentored 1 graduate independent study course
    - Amy Ferguson, Science Education Graduate Student, Screven County High School Teacher
- Chair of the Departmental Curriculum Committee
    - Recently restructured BA with major in Physics degree to exclusively serve those students desiring to receive secondary science education certification through completion of the Master's of Arts in Teaching degree offered by the College of Education
    - Continually updating the BS in Physics degree to reflect best practices of the disciple
- Chair of the Departmental Textbook Committee
    - Responsible for keeping faculty informed of updates and changes in introductory physics textbook offerings
- Volunteered weekly in the nightly (5:30 – 7:30 pm) Departmental Tutoring Center

Contributions at the College Level:

- Mentoring/Mentored new faculty entering into the college on how to develop student-centered courses
    - Designed and lead intensive month long workshops titled
        - "Designing Courses for Significant Learning: How to Excel at Teaching and Learning"
        - "Filling Up Your Pedagogical Toolbox: How to Excel at Teaching and Learning"
- Serve on the College Course and Curriculum Committee as well as the Teacher Education Committee
- Seeking grant support to improve Progress, Retention, and Graduation rates within the College
    - $2,000,000 proposal currently under review by the National Science Foundation Science, Technology, Engineering, and Mathematics Talent Expansion Program
- Faculty advisor in the College Academic Advisement Center
    - Intrusively advised all freshman and sophomore physics majors and minors
    - Assist with summer Student Registration and Orientation Sessions (SOAR)

Contributions at the University Level:

- Program Assessment Leader in the Office for Institutional Effectiveness, Serve the following Colleges:
    - College of Science and Mathematics
    - Allen E. Paulson College of Engineering and Information Technology
    - Jiann-Ping Hsu College of Public Health
- Serve on the Academic Assessment Steering Committee

- Review program assessment plans across all departments in preparation for SACS accreditation
- Serve on the Scholarship of Teaching and Learning Leadership Team
  - Supportive of SoTL activities on campus
- Conducted summer professional development workshops for pre-service and in-service teachers along with colleagues Missy Bennett and Jeff Orvis
  - ESED 7090 – Standard Based Science for High School Teachers (funded by No Child Left Behind Title II Part A Higher Education IMPROVING TEACHER QUALITY grants in 2007-2008, 2008-2009, and 2009-2010)
- Instructor for Conversations with Professors
- Instructor for 2 summer camps for middle and high school students
  - Eagle Science Camp
  - Eagle Quest Summer Institute for Math and Science

Contributions to Profession beyond University:

- Serve as President Elect of the South Atlantic Coastal Section of the American Association of Physics Teachers
- Member of the Georgia Southern SoTL Travelers Team
  - Conduct statewide workshops on the development of Scholarship of Teaching and Learning Projects
- Serve on the Editorial Review Board of the International Journal for the Scholarship of Teaching and Learning
- Author of multiple Test Item Files for Introductory Physics Text
  - **Test Item File for Physics for Scientist and Engineers with Modern Physics Giancoli**, Pearson Prentice Hall, Upper Saddle River, NJ, 4th Edition (2008).
  - **Test Item File for College Physics Wilson Buffa Lou**, Pearson Prentice Hall, Upper Saddle River, NJ, 6th Edition (2006) and 7th Edition (2009).
  - **Test Item File for Physics Walker**, Pearson Prentice Hall, Upper Saddle River, NJ, 3rd Edition (2006) and 4th Edition (2009).
  - **Test Item File for Sixth Edition Physics: Principles with Applications Giancoli**, Pearson Prentice Hall, Upper Saddle River, NJ (2005).
- Faculty Advisor for Mastering Physics (online course tutorial system)
  - Available by electronic mail to relate success stories, share best practices, and provide tips for successfully integrating MasteringPhysics into the physics curriculum with colleagues at other institutions across the country
  - Authored 325 multiple choice pre-lecture conceptual questions to be incorporated into MasteringPhysics, content available across ten textbooks
  - Edited video tutor demonstrations available for assigning in MasteringPhysics
- Reviewed Multiple Prospectus and Textbook Chapters for Pearson Education, Cengage Learning, John Wiley and Sons, McGraw-Hill, and Brooks-Cole