The Georgia Tech Student and Teacher Enhancement Partnership (STEP) Program

Donna Llewellyn, Center for the Enhancement of Teaching and Learning (CETL)
Marion Usselman, Center for Education Integrating Science, Mathematics and Computing (CEISMC)

Sponsored by the National Science Foundation through the GK-12 program
Primary Goals

- To broaden the education of science, technology, engineering, and mathematics (STEM) graduate students to include intensive experiences in educational pedagogy and process;
- To encourage the participation of STEM faculty and students in the difficult issues facing K-12 educators through the nurturing of university-school partnerships;
- To assist K-12 teachers in their endeavor to improve classroom instruction;
- To help schools improve K-12 student achievement in STEM.
10-week Summer Training Program for Fellows
School year spent paired with Metro-Atlanta area high school.
Time Commitment--10 hours per week in school, 5 hours per week preparation.
Compensation--$26.5 K for students who are post Ph.D. qualifying exams, $21.5K for students who are pre-qualifying exams, plus tuition.
STEP Fellows - Cedar Grove High School, DeKalb County

Pamela Reid--Ph.D. student in Chemical Engineering.

Sundiata Jangha--Ph.D student in Mechanical Engineering
STEP Fellows at Dunwoody High School, DeKalb County

Frank Pyrtle—Ph.D. student in Mechanical Engineering

Kendra Taylor—Ph.D. student in Industrial and Systems Engineering
STEP Fellows at Westlake High School, Fulton County

David Woessner—Masters student in Mechanical Engineering and Management

Scott Cowan—Ph.D student in Mechanical Engineering
STEP Fellows at Tri-Cities High School, Fulton County

Christal Gordon--Ph.D. student in Electrical and Computer Engineering

Rick Peltier--Ph.D. student in Earth and Atmospheric Science
STEP Fellows at Marietta High School, Cobb County

Adam Austin--Ph.D. student in Electrical and Computer Engineering

Demetris Geddis--Ph.D. student in Electrical and Computer Engineering
STEP Fellows at Rockdale Magnet School for Science and Technology, Rockdale County

Yolanda Alexander--Ph.D. student in Industrial Engineering

Kacy Cullen--Ph.D. student in Bioengineering
STEP Philosophy of Partnerships

• Partnerships must be based on common goals.

• All partners must experience benefits from the partnership.

• School-University partnerships that flourish are based on genuine mutual respect by all parties.

• Team-building and proactive communication are crucial to a successful partnership.
K-12 Benefits from STEP Program

- Fellows serve as content experts for both high school students and teachers, and challenge students to improve critical thinking skills
- Fellows can help increase level of academic bar
- Fellows serve as mentors who can relate to students
- Program provides some funding to initiate new activities at the high schools
- Schools can take advantage of Georgia Tech resources
- Fellows provide fresh energy and enthusiasm to schools
University Benefits from STEP Program

Valuable Graduate Student Experience

- Increases leadership and communication skills
- Improves teaching skills
- Increases confidence working with students
- Helps broaden or sharpen perspective on career paths
- Provides avenue for graduate students to “give back” to community
Mutual Benefits from STEP Program

Strengthen K-12/University Connections

- Positively influences the pipeline of students entering the university.
- Increases SMET career expectations of minority students.
- Facilitates developing mutually rewarding professional opportunities for both K-12 and university faculty.
“As I prepare myself in the areas of research, teaching, and service, I realize that Tech will prepare me for research. However, it is important to me that I also prepare myself in both teaching and service in order to be the best faculty candidate I can. I am grateful for the opportunity that the STEP Program has provided me in these two areas.”

“Perhaps this is selfish, but the greatest accomplishment is rather “me” oriented. I discovered that I want to be a high school teacher.”
“I was able to improve my speaking and presentation skills and overall confidence through prelab talks and the career presentations. I have a new respect for teachers, and while I do not believe I am cut out for teaching, the first hand experience will be invaluable to decisions related to my future career plans.”

“There are probably more instances, but at some point in the future, I will undoubtedly draw upon my experience as a STEP Fellow to encourage someone, instruct someone, or even lead someone.”
Demetris Geddis

- Marietta High School
  - City of Marietta
- 5th year Ph.D. student in Electrical and Computer Engineering
- Current Career Goal: Work in industry and then teach at high school level later.
Algebra I Labs
- Reinforce concepts or lessons learned in class
- Illustrate real world problems that use algebra
- Improve Algebra I pass rate

Software Assistance
- Assist teachers in learning new software
  - Geometer’s Sketchpad
  - TI interactive
- Use animations to give students visual example
  - Ambiguous case of the Law of sines
  - Statistics normal distribution

After School Tutorial
Algebra Labs at Marietta High School

• Linear Equations
• Systems of Linear Equations

• Slope
• Direct Variation

• Point-slope
• Slope-intercept
Professional & Personal Benefits

- Improve leadership skills
- Gain teaching experience
- Practice presenting and teaching technical problems at a very basic level
- Observe the problems that plague our public school systems - looking for solutions
- Feel the joy students have when they see the light or reach their goals
Frank Pyrtle

- Dunwoody High School
  - DeKalb County
- 4th year Ph.D. student in Mechanical Engineering
- Current Career Goal: Be a professor.
Activities at Dunwoody H.S.

- Science Fair
- Teaching
- Mentoring
- Sharing methods and strategies
Professional & Personal Benefits

- More experience teaching scientific methods
- Practicing objectivity
- Sharpening teaching skills
- Developing teaching philosophy
- Influencing the lives of youth
Pamela Reid

- Cedar Grove High School
  - DeKalb County
- 3rd year Ph.D. Student in Chemical Engineering
- Current Career Goal:
  Work in industry while doing outreach and then maybe teach high school much later.
Activities @ Cedar Grove H.S.

- General Chemistry
  - Become comfortable in laboratory environment
  - Critical and analytical thinking
  - Connect chemistry and math
  - Teach concepts

- Accelerated Chemistry
  - Science Fair projects
  - Laboratory skills
  - Analytical thinking
  - Improve computer skills in relating to data analysis
  - Teach concepts
Activities @ Cedar Grove H.S.

- Advanced Placement Chemistry
  - Advanced laboratory skills
  - Report writing
  - Presentation skills
  - Working in teams

- Physics
  - Report writing
  - Working in teams
  - Error consideration
  - Professional development
Professional and Personal Benefits

- Teach concepts
- Connect labs with concepts
- Share experiences with students
- Opportunity to mentor high school students
Kendra Taylor

- Dunwoody High School
  - DeKalb County
- 4th year Ph.D. student in Industrial and Systems Engineering
- Current Career Goal:
  Work as a strategic consultant, then be an entrepreneur, and then be a professor.
Activities @ Dunwoody High

- Experience giving lectures
- Assist with Science Fair
- Mentor students
Young Ladies Initiative

- Goal: Guide young ladies toward success
  - 17 young ladies
  - 5 professional women
  - 9th-12th grades
  - 8 weekly sessions covering goal setting on social, academic and personal levels important to young ladies
Professional and Personal Benefits

- Lectures – Practice classroom management for professorate
- Science Fair – Better understand research process to become a better researcher
- Mentoring – Gain insight into the concerns of students exiting high school
Contact Information

- Donna Llewellyn
donna.llewellyn@cetl.gatech.edu
404-894-2340

- Marion Usselman
marion.usselman@ceismc.gatech.edu
404-894-9673