Mentoring doctoral students means exposing them to the excitement of research and providing them with opportunities and tools in a way that inspires and enables them to become lifelong learners and productive citizens. I often push students far beyond what they believe themselves to be able to accomplish. I do this because I want to prepare students to be leaders in the field, not followers.

During my 25 years at UCF, I have supervised 23 Ph.D. candidates, 13 masters of science students, and 11 Honors in the Majors projects. My former students are currently at prestigious institutions such as Oxford, INRIA, Carnegie Mellon, Michigan, Ohio State and companies such as IBM, Facebook, Harris, SAIC and SRI.

As a mentor, my goal is to help my students to participate actively as researchers in and members of my discipline. In my view, mentors can best help their students by arranging opportunities for them to not just “feel” like researchers but also to begin to be active contributors to their discipline. This means creating a culture where doctoral students have many opportunities to interact with their cohorts to share ideas, engage with researchers in the field, and act as mentors for undergraduate students.

For instance, every summer we host 10 undergraduates from all over the country under our NSF-REU (Research Experience for Undergraduates) site. This provides a great opportunity for doctoral students to mentor undergraduates and gain leadership experience in guiding research projects. These projects are often highly competitive research efforts, funded by agencies like the National Science Foundation, National Institutes of Health, and the Defense Advanced Research Projects Agency.

I have also regularly sent students to conferences even if they do not have papers to present, so that they have a chance to learn about the latest research and network with researchers from industry and academia. And, I have brought industry and academia to UCF. Every year, I invite several top international...
researchers in computer vision to UCF. Typically, the visitor
gives a technical talk in the morning and students get a chance
to present their work and get the visitor’s feedback in the
afternoon. More recently, I have encouraged these visitors
to give “journey talks”—stories about how they started their
graduate studies, their Ph.D. work, their first jobs, research
problems, and their students. These talks have been very
popular among my students because they reveal the human
side of a scientist.

Finally, I emphasize the “publish or perish” paradigm: to
graduate, to get a job, to get a promotion or tenure, to become
an editor or fellow of a professional society, publishing is
essential. I do not dictate what doctoral students do in their
research. My role is to act as a critic who helps them refine
their research instead of simply solving problems students
encounter.

All of these activities function together as ways to help foster
a culture where doctoral students are conducting their own
research, participating in mentoring undergraduates, engaging
with academic and industry professionals, and, ultimately,
becoming active participants in the research culture of their
field.

Taking Loggerhead Learning Online: A
Problem-Based Approach to Science Inquiry
Deirdre Englehart

Some recently asked how I prepare teachers for the 21st
century, specifically, “What will teachers need to know
and do to support children in the year 2025?” Of course I had
many ideas, but one thing that resonates strongly with me is the
fact that students of the future must address many issues and
problems our society has created. Children must learn how
to think critically; therefore, I need to prepare future teachers
to teach with methods that support this type of thinking.
One format that allows me to model thinking is problem-
based learning. Lener and Pinou explain: “in problem-based
learning, students are presented with a realistic scientific
dilemma…. Students work collaboratively to research the
problem, conduct hands-on activities to learn more about it…
and eventually make informed recommendations for solving
the problem based on their findings” (2007, p. 50). Problem-
based learning (PBL) fits with my science methods course.
It also aligns with scientific inquiry because it is based on an
authentic problem and provides opportunities for students to
investigate and learn science while they address the issue at
hand. This format can also be used with young children in
the classroom setting.

To prepare my class of pre-service teachers in PBL, we
engaged “Taking Loggerhead Learning Online,” an online
project that used loggerhead turtles as the central theme. Many
students in the course live in coastal Florida communities
where sea turtles lay their eggs, supporting the issue of
threatened loggerhead turtles. In this unit, the problem-based
learning approach reflected the following characteristics:
learning was driven by ill-structured, authentic problems;
students worked in groups; and learning was facilitated by
the teacher while allowing for student direction, reflection,
and implementation (Savery, 2006). The driving question for
this project was, “What can we do to support the survival of
Loggerhead Sea Turtles?” Students participated in various
activities to help them develop background information
related to sea turtles; they then identified a problem related
to loggerhead sea turtles, investigated their own questions
and developed possible solutions. Students were encouraged

Pictured above: Faculty participate in the Poster Showcase
session in the Library Knowledge Commons at the 2011 Sum-
er Faculty Conference, held in May. The conference offered
roughly 90 different sessions primarily led by UCF faculty,
covering topics ranging from implementing service-learning
courses to strategies for helping students in distress. Learn
more about participating in our conferences at <fctl.ucf.edu/
events>.