

# The Quaternion

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The Quaternion is an annual publication of the USF Department of Mathematics and Statistics, which can be visited on the web at <http://www.math.usf.edu/>. Our e-mail address is [mathdept@math.usf.edu](mailto:mathdept@math.usf.edu), our snail-mail address is Department of Mathematics and Statistics, University of South Florida, 4202 E. Fowler Ave., PHY114, Tampa, FL 33620. Our phone number is (813) 974-2643, and our fax number is (813) 974-2700.

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USF was very fortunate this year, with no faculty layoffs, and we continue to make do with the resources we have. One way we make do is with mass lecture courses.

With over 39,000 students at USF-Tampa and 34 faculty in the department, compromises must be made in order to provide students with the classes they need. That includes using mass lectures, usually of 150 – 250 students, for courses like College Algebra, Finite Mathematics, Mathematics for the Liberal Arts, and Introductory Statistics.

A mass lecture course is divided into quiz sections of 20 – 30 students each, each meeting perhaps twice a week. Students get interaction and feedback in the quiz sections, which are led by teaching assistants, but in the auditorium it's all too easy to hide, get lost, or zone out.

Technology is not an answer in itself; in fact, students complained in a recent English survey about the dullness of Power Point presentations. Both history and research suggest better results from personal interactions for students. But as offering that to thousands of students is prohibitively expensive, technology can at least offer compromises that allow us to engage students and enrich their education.

One device is the *classroom response system*, in which each student brings a *clicker* to each lecture session. A clicker transmits tiny messages to a receiver hooked to the teacher's computer. The teacher's computer knows who belongs to each clicker, so the teacher can take roll by asking everyone to click. Then during the lecture, the teacher can ask students to work out little exercises and enter their answers via the clicker; the computer knows the correct answer and can instantly grade the responses. The teacher gets a statistical breakdown of the grades immediately, and can give the class instant feedback.

For example, Fran Hopf starts off a College Algebra session with some warm-up exercises on material from the previous session: solve for  $x$  in  $2x = 7$ . She walks around the auditorium for a minute, receives the students' answers, and then can tell the class that one person entered  $x = 3$ , one entered  $x = 4$ , and 95 correctly entered  $x = 3.5$ . She is carrying a "tablet", a kind of miniature laptop with a stylus so that whatever she writes on the tablet appears on the main screen.

That was the first of seven clicker exercises she did that day. At the end of the semester, clicker responses will be a small part of the course grade.

Speaking of grading, another place where technology fills the gaps is in grading homework, traditionally one of the most labor-intensive parts of teaching. These lower level courses tend to have homework assignments consisting of many small problems designed to test and reinforce a certain pa





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Kummer, Julie Manuel, Lauren Polt, Charli Regel, Jessica Sobkowiak, Athena White, Mathew Wiseman, Joseph Vorder Bruegge, and Besjana Zeqo. Matthew Wiseman won the 2009 PME Outstanding Scholar Award. At the banquet, Professor Vilmos Totik spoke about *The Good Old Induction*.

PME hosted the Hillsborough County math Bowls, when about 400 of the best math high school students from Hillsborough County competed in Algebra, Geometry, Pre-calculus, and Calculus. Middleton and King High Schools won the fall and spring bowls, respectively.

Outgoing President Joy D'Andrea and Vice President Helen Barclay stepped aside for incoming President Michelle Krause and Vice President Besjana Zeqo.

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The Department of Mathematics & Statistics would like to hear from alumni, friends, collaborators, members of the community, and fellow explorers of and guides to the world of mathematics and statistics. Contact us at: 974-2643, or fax 974-2700. E-mail [mathdept@math.usf.edu](mailto:mathdept@math.usf.edu). We have a web-page at <http://www.math.usf.edu/>. Snail-mail address is Department of Mathematics & Statistics, University of South Florida, 4202 E. Fowler Ave., PHY114, Tampa, FL 33620.

We are a growing department in a new university, and we strive to develop new programs to meet the needs and provide opportunities for our students and our community to fulfill their aspirations. With all due respect to Benjamin Franklin, many of the best things in education and scholarship cost money. We would appreciate any assistance we can get from alumni and the community. Feel free to contact our chair, Marcus McWaters, at the above address for details.