Resolution on the Retirement of Research Professor of Physics and Education
Ronald Thornton
May 14, 2014

Ronald K Thornton began at Tufts in 1976, his first position after his doctorate in The Department of Physics at Brown University. For a number of years he worked in high energy physics, but he became interested in the problems of student learning, and in 1984 he founded the Center for Science and Mathematics Teaching. He's been at Tufts throughout, aside from various stints as a visiting professor in physics departments in Chile, Australia, and then Italy, and Italy, and Italy again. (He likes good food.)

That makes thirty-eight years at Tufts.

Ron was one of the earliest physicists to move into physics education research — it wasn't nearly so fashionable in the early ‘80s as it is today. That was a time when Ron and others had just started to get the all-too-clear evidence that traditional methods of instruction in physics weren't working. Students came out of physics courses not understanding even the basic ideas, and Ron was moved to work on the problem.

He began work on “microcomputer based labs,” a “microcomputer” being, of course, a computer smaller than a refrigerator — a new thing in the early ‘80s. (The CSMT started the same year Apple released the first Macintosh.) Working in partnership with David and Christine Vernier, a high school physics teacher and a businessperson, and with fellow physicists Priscilla Laws and David Sokoloff, Ron developed materials that made it simple for students to measure physical quantities in real-time, for display and graphing and analysis. It all really took off with “motion detectors” — a student, or a teacher or professor, could walk in front of a motion detector and see position, velocity, and acceleration displayed in real time on the microcomputer screen. And then force detectors, and ammeters, and so on.

It wasn't enough just to have the tools; much depended on what students did with them. Ron and his colleagues designed sequences of exercises, in curricula for high schools and colleges. They developed the Force-Motion Concept Evaluation as a measurement instrument themselves, to find out how much students understood. (Not real-time, which seems like it's a few years away.) They used the data to revise and test and revise again, until the results were not just statistically significant but educationally significant. Ron didn't want detectable improvements; he wanted game-changing improvements, and he got them. His curricula, Real-Time Physics and Tools for Scientific Teaching, and his Interactive Lecture Demonstrations, are now standards of physics instruction everywhere. And Ron's taught thousands of teachers and professors how to use these materials, in workshops and talks, at the Center, around the country and around the world. (Especially Italy.)

Ron's been awarded a Smithsonian/Computerworld Leadership Award in Science Education and a Charles A. Dana Foundation Award for Pioneering Achievements in Education (with Laws),
and most recently the 2010 American Physical Society Excellence in Physics Education Award (Laws and Sokoloff).

And the Tufts Center for Science and Mathematics Teaching is known everywhere his curricula are used.

Today on behalf of the Department of Physics & Astronomy and the Department of Education, I move it be resolved that we thank Ron for his service to Tufts and to teaching, and we congratulate him on his retirement.

David Hammer, Professor and Chair
Department of Education