In Conversation with an Honored Teacher: Latif M. Jiji

Dr. Latif M. Jiji, the Herbert G. Kayser Professor of Mechanical Engineering at the Grove School of Engineering at City College, was the 2008 recipient of the prestigious Ralph Coats Roe Award from the American Society of Engineering Education. Given to one mechanical engineering educator each year, this award carries a $10,000 honorarium in recognition of excellence in teaching and contributions to the engineering profession. The New Jersey Institute of Technology’s Dean of Graduate Studies, Dr. Ronald Kane, nominated his former teacher, Dr. Jiji, for this high honor.

Dr. Jiji has been with City College since 1964. He received his undergraduate degree from the Massachusetts Institute of Technology, a master’s degree from the Carnegie Institute of Technology and his Ph.D. from the University of Michigan. Dr. Jiji studies heat transfer in a variety of systems ranging from tissues to microelectronics to jets. In collaboration with CUNY Distinguished Professor Sheldon Weinbaum, Dr. Jiji developed what’s known as the “Weinbaum-Jiji bioheat equation,” an equation for determining heat transfer in tissue.

In engineering education, Dr. Jiji continues to take a leadership role at City College and beyond. Here at City College, he is leading a team of engineering, architecture and science faculty to develop a new interdisciplinary master’s degree program called Sustainability in the Urban Environment.

Dr. Jiji is the author of three textbooks on heat transfer, and with a Fulbright Scholar award, he served as a lecturer and researcher at Senegal’s Université Cheikh Anta Diop from 2004 to 2005.

To learn more about Professor Jiji’s outstanding approach to teaching and mentoring, we visited him in his office and posed a few questions.

Let me first congratulate you for winning this award. What started you on a teaching career and what role models inspired you?

As a stateless refugee with an undergraduate degree and no prospect for employment in 1952, my only option was to enroll in graduate school. That led to teaching. When I started to teach in 1954, I thought about the teachers I had had in the four universities I had attended. I counted four as truly outstanding. The first was Professor Ascher Shapiro at MIT. He was an inspiring model who became my ultimate standard. Crucial to emulating him was a chance discovery during my first year...
of teaching that student evaluation is absolutely essential to improving one's teaching skills. To this day, I ask my students to evaluate my courses and my teaching. I still find their input indispensable.

**What are the attributes of a good teacher?**

You begin by believing that all students can learn—some more easily than others. Some need to first recognize the correlation between hard work and success. Effective teaching involves attention to a host of factors: knowledge of the material, preparation of lectures, assessment of students' comprehension, availability to students, patience, fairness, and sympathy. Excellence in teaching does not happen by showing up in the classroom and office three days a week.

**What do you emphasize in your teaching?**

Teaching the fundamentals is paramount. Equally important are discipline, responsibility, punctuality, accuracy, professionalism, and ethical standards. Central to learning is practice. To unlock the learning channels one must identify stumbling blocks by closely monitoring and reviewing students' work. This task requires experience, skill, and judgment and can not be done by a graduate assistant. It is the responsibility of the teacher.

**Do you consider yourself a lenient teacher?**

I am anything but lenient. While grade inflation has swept academia, I remain loyal to an old fashioned grading system where A's and B's are earned by superior performance. Students accept, and perhaps prefer, a demanding teacher provided he or she is equally demanding of himself or herself. I insist that students attend class on time and turn in assignments when they are due. At the same time, I am never late to class and all assignments, projects and exams are graded and returned the next time the class meets.

**Can you tell us about mentoring students and supervising their research projects?**

Mentoring is a fascinating process. One-on-one mentoring provides an opportunity to scan the student's mind and monitor the learning process. Here, teaching proceeds in an iterative manner where the teacher must continuously modify instructions to match student's comprehension. This is very different from teaching a class where it is more difficult to assess the level of understanding. That's because most students remain silent when an explanation is not clear.

**What are your views on mentoring and supervising undergraduate research?**

Mentoring undergraduate students is a challenging exercise. The key is identifying a suitable topic that has the right balance. It must be interesting, relevant, and just beyond the student's ability. Undergraduate research requires different skills for both student and teacher. The student must learn to function in a less well-defined environment and move a project forward without the pressure of examinations. The instructor must limit the inevitable stumbling and setbacks common in research projects to avoid discouragement, maximize learning, and maintain progress.

**Do you use any special teaching techniques?**

Spoon feeding is not one. Engaging students as active participants in the formulation of a theory or principle is an effective teaching tool. This is best done by triggering their curiosity and imagination through challenging and inspiring questions.

**Could you give us some examples of this?**

In introducing the subject of natural convection in heat transfer, I do not start with a description of the phenomenon and definition of key terms. Instead, I show a picture of water boiling in a pot in a space vehicle orbiting the earth. I ask the students to examine the picture and tell me if anything is wrong with it. After a long silence, some of the students begin to identify the contradictions in the picture. For those students who do not uncover the contradictions, hearing the explanations and answers from other students can be more effective than hearing them from me.

Another example has to do with a lesson on microscale phenomena. A small ant falls from a table to the floor. It survives with no injuries and walks away. For a person, this is equivalent to falling from the Empire State Building. Clearly, no one survives such a fall. Why does the ant survive and not the person? Although this is a difficult question for students to answer, it captures their attention and motivates them to learn.

**In your teachings, do you stray beyond the subject matter of a course?**

Yes, indeed. Most important is teaching students how to think and develop a systematic problem-solving methodology. Beyond this, I like to teach what is necessary to succeed. This includes believing in yourself, learning to question the premise, refusing to accept “no” as an answer, turning a setback into an advantage, and not counting on retreating.
Could you give us an example of not counting on retreating?

This is a lesson I learned from a history class in elementary school. We learned about the Moors’ invasion of Iberia in 711. Their general, Tariq ibn Ziyad, after crossing the Straits of Gibraltar, gave an order to burn his ships. He then addressed his troops. Every Arab youngster, at least of my generation, can recite a famous phrase from his speech: “The enemy is in front of you and the sea is behind you...” In Arabic, this phrase has a very poetic ring to it. I remember how I was fascinated and inspired by this line, perhaps because it was so easy to visualize and imagine being one of Tariq’s soldiers. I have acted on this and burned my ship more than once in my life. After receiving tenure at the University of Toledo, I left for another position at New York University. After I was tenured there, I left for the City College. I did earn tenure here but did not leave. This is a familiar way of challenging oneself. It’s also known as raising the bar, overreaching and boxing yourself in. I admit that there is an element of risk in this approach. Nevertheless, this is a lesson I teach in a variety of ways such as giving a difficult but interesting assignment, drafting students to participate in competitions, urging students not to count on dropping a course, etc.

As you look forward, have you considered retirement?

If you understood what I have been saying, you should have inferred that it is totally incompatible with my philosophy. Perhaps we should schedule a meeting to discuss these ideas further.

Engineering students hosting educational activities at the Family Engineering and Technology Day, March 1, 2009. BME students Jaeseung Hahn (Vice President) and Olivia Plante (President) of the Genetics and Bioinformatics Club demonstrate shotgun genome sequencing method (a) and DNA model building (b, c). Evgueni Chepelevski, ME, (President) and Juan Andrango, CpE, (Vice President) of the Art of Science and Engineering Club display artwork created by students using the scripting language PovRay (d).