

# Teaching Philosophy

Tetyana Antimirova

I consider myself first and foremost a teacher. I see teaching as both a privilege and a colossal responsibility. Teaching is the profession that has enormous potential to influence many lives and to participate in shaping our future generations. I truly believe that my own teachers strongly influenced my choice of profession and thus, the entire course of my life. I view my role as an educator dedicated to help my students achieve their academic goals, become life-long learners and reach their maximum potential.

As far as I can remember, I have been fascinated by the natural world around me. My parents often recollected that weekend after weekend I asked them to take me to the local Natural History Museum. I was fortunate to have very knowledgeable and dedicated teachers who maintained and nourished my interest in sciences all the way through the years of middle and high school, and later through the university. Today, I try to share my fascination of physics with my own students. Teaching physics brings me the enormous personal satisfaction of giving back what I was so lucky to have received as a student many years ago.

## Challenges in Science Teaching and the Role of Class Engagement

Generally, there is a wide gap between what we teach and what the students actually learn in our classes. Knowledge does not become truly functional until the student "appropriates" it. Although traditional lectures remain an important part of university teaching, a bulk of research on students' learning demonstrated that the students learn more effectively when they construct their own understanding through the combination of guided enquiry-based activities. One of my most important roles as an educator is to create an environment where the students are encouraged to formulate their own questions, solve problems, perform experiments and look for their own answers in a safe and inclusive environment. The steadily growing confidence in the students' ability to accumulate the knowledge is the best motivator in their future studies.

The university landscape has changed dramatically over the last three decades. Unlike in the past, when the majority of students taking physics classes were either physics or engineering majors taught in small traditional lecture classes, today's large physics classes also include students in the life sciences. In addition, today's physics classes for engineering programs have expanded dramatically. Therefore, the quality of physics teaching today affects a much wider population than ever before. Effective teaching-learning is unlikely to happen in a passive and disinterested class. Guided enquiry is the approach I strive to use in all aspects of my teaching. I always stress that studying physics offers unparalleled opportunities to develop such transferable skills as efficient problem-solving, critical thinking and logical reasoning. I believe that physics offers excellent tools to expose our students to the process of scientific thinking and to let them experience the process of scientific discovery. I aim to bring students closer to this goal by relating to the students the relevance of everyday experiences.

I believe that class engagement can be greatly enhanced by the use of modern educational technologies, whenever appropriate. It is also crucial for my presentations to include live in-class demonstrations. When live experiments are not possible, I make use of video-analysis tools and computer simulations.

Every student learns differently and, unfortunately, physics is perceived by many as a difficult subject. In my classes, I encourage a small-group collaborative environment and I try to create an atmosphere of mutual respect and inclusiveness in which students with different learning styles and from different backgrounds feel comfortable.

## The Impact of Science Education Research

My latest research interests grew from and are closely related to my teaching. My research findings are fully integrated into my teaching. A large part of my efforts have been directed at looking for new tools and methods of teaching physics, implementing them in the classroom and evaluating the outcomes. Over the years I incorporated into my own teaching interactive lecture demonstrations, peer training and collaborative small-group work. My current efforts focus on the use of advanced technologies such as clickers, video-based motion analysis, real-time data acquisition and analysis tools, on-line tutoring and homework systems, educational applets and computer simulations, and, most recently, the use of tablet PCs. All these tools are invaluable in supporting enquiry-based and activity-based learning. I develop, test and implement new teaching methods using these tools, and study their impact on students' learning outcomes, motivation and attitudes towards science.

The high school physics experience has a crucial impact on students' attitude towards science, as well as on the learning outcomes in introductory physics courses. Improving the students' success rate by facilitating the transition from high school to university is a pressing issue for a majority of Ontario Universities. This is why at Ryerson I initiated an outreach program to the community of high school physics teachers and volunteered to collaborate with

representatives of the Toronto District School Board.

I believe in the need for on-going professional development. As educators we have a duty to share our findings with our colleagues. I am always ready to share my experience in using educational technologies and interactive pedagogies with my colleagues at Ryerson and beyond. This is why I became involved with professional organizations, whose mandate is to improve physics education and to advance the professional development of physics faculty at all levels. Currently, I serve as a Chair of the Division of Physics Education of the Canadian Association of Physicists; I am a Member of the Committee on International Physics Education of the American Association of Physics Teachers (AAPT), an Ontario Section Representative to AAPT, and a member of the executive board of the Ontario Association of Physics Teachers. Over the last several years I delivered numerous contributed and invited talks and taught several workshops at local, national and international conferences, and professional society meetings.

I believe that while we teach, we also learn from our students. I always seek informal feedback from my students, and I am always open to their suggestions. I view each new teaching assignment as a challenge and an opportunity to learn more about teaching itself and about my students. Last but not the least, students endowed with a life-long thrust of curiosity and learning will be competitive and successful in their endeavours of choice. In order to transform our students into life-long learners we, as educators, must lead by example by being proactive and always strive for our own self-improvement.