Questions and Answers with Dr. William A. Wulf,
President of the National Academy of Engineering

Q. What is the National Academy of Engineering, and why is it interested in engineering education reform?

A. The NAE is part of a private, non-profit corporation. We are NOT part of the government. We are, however, chartered by Congress to be two things: 1. an honorific society, and 2. advisors to the government on issues of science and technology.

Being an honorific society means that you cannot join the NAE, you must be elected by the existing membership. Election to the NAE is generally considered to be the highest honor that can be bestowed on an engineer by his/her peers.

As advisors to the government, we are noted for being absolutely independent and objective – and we frequently tell the government what it doesn't want to hear. This function of the NAE has been described as "telling truth to power."

The NAE is interested in and concerned about engineering education because the quality of its workforce is the most valuable asset that a country has. Unfortunately curriculum has not been keeping up with the practice of engineering, nor has pedagogy kept up with what we know about how people learn. The combined effect is that the country's ability to compete in the global marketplace is declining. In my view, reforming engineering education is one of the most urgent issues on the nation's platter.

Q. What is the future for engineering in the United States?

A. The future of engineering in the United States is precisely the 64 trillion dollar question. Either we learn to compete in the new globalized (or "flat" as Tom Friedman calls it) world, or our standard of living will decline.

Q. Why should a student go into engineering? What are the rewards of an engineering career?

A. Well, there are lots of reasons for going into engineering. But maybe first I ought to say a word about what engineers do – my favorite quick definitions for that is "design under constraint." We design solutions to human problems, but not any old solution will do – we have to satisfy constraints of size, weight, power consumption, safety, reliability, ergonomics, etc., and oh yes, cost.

So why go into "designing under constraint"? Well, it's fun. It's creative. It makes a difference in people's lives. And you make a pretty good living. Your starting salary as an engineer will be 1.5 to 2.0 times that for someone with a liberal arts degree. Your average salary will be almost the same as that of a lawyer. And, among the Fortune 500 companies, the most common undergraduate degree is that of an engineer (22 percent of these CEOs have a B.S. in engineering) – so your shot at the corner office is pretty good, too.

Speaking of making a difference in people's lives, not that just 100 years ago:

- almost no one had electricity
- almost no one had a car (in fact, there were only a few tens of miles of paved roads)
- the first airplane flew just two years ago
- water was dirty; in fact, water-borne diseases were the third leading cause of death. The average lifespan in the U.S. was 46 – it is now 76+. About 20 of that 30-year increase was due to clean water.
- of course, there were no telephones, radios, TVs, refrigerators, computer, etc.

And the list goes on. The point is that engineering has done more to improve people's quality of life than any profession.

Q. Why are you interested in coming to St. Thomas to keynote the School of Engineering's introduction?

A. I want to participate in celebrating the creation of a new engineering school. I am involved with Olin, and the new program at Smith for the same reason. I also think it is easier when these new programs to "start out right" they have less baggage.

Q. How do we make people, the public, interested in engineering and its role in society?

A. I wish I knew how to get the public informed. The reality of what it is like to be an engineer and the stereotype are polar opposites. If the public knew the truth, I think they would be very interested! So I see job one as getting them informed.

Q. What is the importance of a coordinated partnership among government, K-12 education, higher education, industry and the public in improving engineering education and stimulating more interest in engineering?

A. I think a partnership is very important, but I also think we have to get off our duffs and take responsibility – we can't fob the problem off on somebody else creating that partnership.