

“The Engineering Profession: Challenges and Opportunities”

Speech delivered by:

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On receiving an Honorary Doctorate in Science

Spring Convocation
McMaster University
June 12, 2009

Mr. Chancellor,

First, allow me to express my most sincere thanks to the Senate of McMaster University for bestowing upon me such a great honor. I am truly humbled to receive an honorary degree from Mac – a university that is a global leader in engineering education and research, **but more importantly, one that has played such an important part in my professional career.** I am also delighted to see so many of my McMaster friends, colleagues and mentors here today.

Dear graduates, on this very special day, I take great pleasure in congratulating you on your academic achievements. I hope you are proud of your accomplishments that have brought you to this important transition in your lives. I know all of you have worked hard to get here, but let me also acknowledge the contributions of your parents, family members, teachers, mentors, and friends who have supported you during your studies at McMaster. Without them, the journey would have been more difficult and less rewarding.

It is particularly exciting for me to be sharing the stage this afternoon with Stephen Elop, President, Business Development at Microsoft. You now know Stephen as the person responsible for Microsoft Business Development software ... a responsibility that includes products such as Microsoft Office, Sharepoint, social computing software, ERP and CRM. I, on the other hand, remember Steve as the 4th year computer engineering student who during the summer of 1985 helped me assemble more than 300 TI microcomputers (the Mac Eng Micro) for 1st year engineering students. **Congratulations Stephen for your exceptional achievements ... you are an outstanding role model for the engineering Class of 2009.**

Celebrating McMaster University

Since its founding in 1887, McMaster University has built a reputation for academic and research excellence, and has become internationally renowned for innovative approaches to teaching and learning. McMaster's pioneering efforts have introduced revolutionary concepts such as problem-based learning and evidence-based medicine leaving a lasting legacy, not only in Canada but around the world.

The Faculty of Engineering also has a long history of academic innovation and of fostering the growth of emerging multidisciplinary areas in engineering education. Including Canada's first 5-year engineering and management program in 1974, the innovative multidisciplinary engineering and society program in 1992, and the graduate Schools of Engineering Practice and Biomedical Engineering in 2006! ... McMaster is really **the** benchmark in engineering education in Canada.

So I am really honoured and humbled to be returning to McMaster today.

Key messages

In the next few minutes, I'd like to reflect on some of the challenges facing the engineering profession in Canada as well as the many opportunities it offers you, who represent the upcoming generation of engineering leaders.

A few weeks ago, the 1st ever Canadian National Engineering Summit was held in Montreal to discuss how the engineering profession can contribute to a healthier, cleaner, safer, more competitive and sustainable society.

At a high level the summit acknowledged that engineers must:

- enhance their collaboration across disciplines and professions;
- increase their influence in policy making
- re-examine the accreditation process
- transform engineering education and practice
- encourage greater participation from underrepresented groups; and
- attract and retain more women in the profession.

Allow me to focus on a few of these challenges.

Reengineer Engineering Education

How should the engineer of the 21st century be trained ? I would argue that the need to “reengineer” engineering education is pressing due to (a) the explosion of knowledge, (b) the growing complexity of societal problems, (c) the worldwide reach of these problems and (d) the demands of a highly competitive global economy.

So, how can we ensure that engineering education is well aligned with these needs?

There is a strong consensus that engineers of the 21st century must be broad thinkers who appreciate the global and societal implications of engineering and value the critical links between technology and society. In 2001, the 2020 Engineering Forum held in Ontario concluded that engineers had to acquire skills leading to “*social, global and political awareness*” and to “*ethical decision making*”. It called for a more flexible definition of engineering by promoting interdisciplinarity, a better balance between “technical and artistic training” and more emphasis on teamwork and communication skills. While McMaster’s Faculty of Engineering has been a leader in this field, through the introduction of

the Engineering and Society program, I would argue that such an approach needs to be broadened to the entire curriculum and across the country.

Attracting more women in engineering education

Incorporating these changes will enable engineering education to respond to another key challenge: *the continuing under-representation of women in engineering*. McMaster, like other universities in Canada and abroad, still faces the continuing under-representation of women in engineering studies. In fact, since 2001, female participation in undergraduate engineering in Canada has fallen from 23 to just 17%.

Several factors can explain this decline, including an overly rigid and heavily prescriptive curriculum, the enduring image of engineering as a “male-dominated” profession and women’s attraction to the life sciences. However, there is ample evidence that a more creative and socially relevant curriculum tends to bring and retain more women into engineering studies. Their stronger presence in fields such environmental engineering and biomedical engineering confirms that women tend to internalize engineering as a helping profession.

In 2006, National Engineering Week celebrated engineering as “a caring profession”. Canadian engineers need to impress more on the public this key dimension of our profession.

Enhancing the profile of our profession

This brings me to another major challenge we face as engineers, which is raising the *profile* of our profession.

It has been said that engineering in this country is an *invisible profession*. This is mainly because most Canadians have only a vague and limited idea of what we do. As a result, our national consciousness is not aware of the role engineers play in medical research advances; in alleviating human suffering; in creating the iPod (or the Zune 120) that puts 30,000 songs at our fingertips!

At the same time, the engagement of engineers in public policy issues has been virtually non-existent. This is why I have been encouraged by two recent initiatives. First, the creation in 2006 of the Graduate School of Engineering Practice at Mac and the Dofasco Centre for Engineering and Public Policy and the launch in 2008 of the PEO Centre on Engineering and Public Policy. I urge you to get involved in the development of public policies, to ensure that public policies are based on sound engineering and scientific. At the same time this will allow you to translate complex engineering concepts into a publicly accessible discourse.

If we want to cast away this “*cloak of invisibility*”, we need to get the word out about the work we do, so that Canadians fully recognize the benefits we provide for our society.

A new world of engineering opportunities

Indeed, this is an exciting time to be an engineer! More than ever, an engineering education offers graduates *diverse* and *dynamic* ways to make a difference.

Increasingly, employers are looking for engineers who are ... what they call “*Entrepreneurial integrators*”. That is, *creative people* who bring together pieces of various disciplines to *make things happen*.

Those familiar with the history of engineering know that creativity has long been a distinguishing feature of our profession. As Albert Einstein once observed: “**other professions (scientists) investigate that which *already is*; engineers create that which has *never been*.**”

Graduates of the class of 2009, you are leaving here today with a *degree* in hand. But your engineering education is only *just beginning*; indeed, I urge you to consider yourselves as lifelong learners eager to continuously expand and broaden your knowledge.

Conclusion

There is no doubt in my mind that the class of 2009 is *more* than up to the challenges I have identified earlier. Congratulations and all the best to each and every one of you.