Occasional Address
by
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Chancellor, Professor Vicky Sara; Vice-Chancellor, Professor Ross Milbourne, Faculty Deans, staff, distinguished guests, family and friends of the graduates, and, of course, the graduates, who I may today address as my fellow engineers. To you, congratulations on having successfully completed your studies.

It has been a lot of hard work, I know, but hopefully also some delight in discovering and appreciating the great work of the engineers that preceded you. And, while the learning and hard work will not stop, you are now ready to embark on a great adventure. The education you have behind you and, in particular, the practice-based style of education developed by the Engineering Faculty of this University, gives you an excellent foundation on which you can build your professional career, and so it is perhaps appropriate at this point to reflect briefly on what engineering is all about.

I am certain you have realized by now that engineering is not easy to define or describe; it has many facets, and it is this that makes it both fascinating to practice and difficult to convey to the rest of society. It relies on a mixture of the knowledge base of natural science, the methodology of scientific rigor, intuition, creativity, and, not least, common sense. If we, for a moment, visualize a scale of professions stretching from scientists on the one hand to artists on the other, engineers lie somewhere in the middle, with architects somewhere between engineers and artists. If for the scientist the aim is to discover the truth about Nature, and for the artist the aim is self-expression; then, for the engineer the aim is to be useful to society.

And we have been useful. If you look around you here today, almost anything you cast your eyes on owes its existence to the work of engineers. Take this lectern; the factory that produced the varnish; the saw that cut the wood, the steel mill that produced the steel for the saw blade, the equipment that extracted the iron ore for the steel mill; all developed and designed by engineers. Or take the lighting; the automated machines that made the light bulbs, the power stations that produce the power, and the networks that deliver the power; all developed and designed by engineers. It is an inheritance you can be proud of.

An engineering education provides a knowledge base that is applicable to a wide range of activities in a modern society. Engineers are found in research laboratories, in design offices, in maintenance organizations, in the private and public domain, and as anything from one-man backyard operators to managing directors of some of the world's largest corporations. So, what you have in front of you is an exciting career with a wide range of possibilities. However, this also requires you to make a choice between all these possibilities, and how are you going to do that? Perhaps you should not make a choice, but just accept whatever happens to come along? But that would not be in accordance with your training and the deliberate, analytical approach that is the hallmark of engineering. It would be a bit like going to the train station and asking for a ticket to anywhere. At first it is exciting just to be traveling, but as you get close to the end of the journey, you might look out at the scenery and realise that it does not appeal to you at all.

You should not avoid taking decisions and, of course, it is not a single decision, it is a sequence of decisions as you progress through your career, each one based on your accumulated experience at the time. But what is the decision criterion? What makes one option better than another? Well, one approach, and the simplest one, is to view just the job itself, characterized by such parameters as salary, power (as in how many people are supposed to follow your orders or how large a budget you control), and prestige (as in recognition by society). But a little reflection and some application of your newly acquired analytical skills reveal that this must be inadequate; it leaves out the most important factor – you. If your professional purpose is to be useful, effective, and contribute to society, then this requires a match between your abilities,

nature, education, and experience, and the requirements of the job. Optimising that match must be your decision criterion.

Therefore, in addition to being able to characterise and judge the options open to you, you must know yourself. And this can be, by far, the most difficult part. Some of the things you see when looking at yourself may not be ideal, but if you acknowledge them and understand them you can avoid being tripped up by them. And, conversely, by understanding your strengths and abilities, you can develop and exploit them. It is easier and more effective to build on your strengths than to try to eliminate your weaknesses.

Related to this, but as a bit of a digression, I believe there is today a tendency in the engineering profession, particularly here in Australia, to have a very shallow view of what an engineer should be like. A view that to some extent emphasizes management over creativity, and conformity over imagination and innovation. Now, management is important, but you first need to have something to manage. And the statement, which I have seen a few times now, that when evaluating an engineer the engineering skills can be taken as given, and that it is only all the other skills, such as people skills, management skills, and marketing skills that make the difference, makes me shudder. It is like saying that all painters have the same painting skills, and the difference between, say, a Rembrandt or a Picasso and any one of the thousands that submit paintings to the competitions here in Sydney is solely due to other factors. No, there is quite a variation in the engineering skills about the average, and only relatively few stand out as great engineers. I hope you will strive to be among those.

Finally, I would like to mention the one further ingredient in your career that is more intangible and certainly less amenable to any analysis, and that is passion. Not the heavy breathing type that can be confused with asthma, but like an inner force that drives you to pursue a certain line of work. You can override it and do something else, but after a while it makes you feel unsatisfied and that you are wasting your time. Let me give you an example – myself. My father was an engineer, and from my earliest recollections, I knew I was going to be an engineer. After university I worked as an engineer for a number of years, but somehow I got the idea that being a physicist exploring the secrets of nature would be a nobler activity. So I got myself a PhD in theoretical physics and worked in basic research for a number of years, until one day I woke up and said to myself: "Why am I doing this? I don't really care that much if there are gravitons or not; what I really like to do is to build things. Things that are useful to other people." And I went back to engineering and have never again doubted that that is what I want to do.

Now, I was fortunate in that I found out almost by osmosis what I was passionate about; for many of you it might have been, or might still be, a more difficult process. But I do believe that if you take the time to look into yourself, or listen to that inner voice, you will discover what you are passionate about. Some of you might have read a book by a Brasilian author, Paulo Coelho, called "The Alchemist". It is a fable about a young goatherd in Spain who becomes convinced that he must seek a treasure buried near the pyramids in Egypt. So he sells his goats and starts out on what turns out to be a long and difficult journey, but despite both hardships and enticements to settle down on the way, he continues his pursuit of this goal. Along the way he meets the alchemist, and the alchemist makes him understand that it is not the treasure that is important, important is that he is learning to follow his inner voice and is confident in doing so. The alchemist also shows him how to convert lead into gold, as a metaphor for the ennobling of any work by your own belief in and passion for it.

So, go forward with confidence; confidence in trusting your inner voices and in your abilities as engineers, and above all, be passionate about your work. And good luck!