Occasional address

University of Wollongong graduation ceremony, 1 November 2017

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A long time ago — in 1969, to be exact — I received my bachelor's degree. It was from Rice University in the US and I then faced a big decision. I was about to be drafted into the army, and refusing meant going to prison. Instead, I decided to leave the country and settle in Australia.

It was quite stressful at the time but in retrospect it was one of the most important things that ever happened to me. It led me to learn a lot about politics and to rethink my views. I started thinking for myself about issues in a way I never had before.

I learned that if you encounter a major disruption or trauma, there's no need to despair. It might be what you most feared, but it can also be an opportunity for growth.[1] If fact, if you're going to experience a huge upheaval in your life, it can be better if it's while you're younger and more adaptable.[2]

I never set out to be a professor. I got where I am now not by seeking advancement but by doing things I cared about. While doing my PhD in theoretical physics at Sydney University, I became intrigued by the politics of knowledge and started work on my first book.[3] It took years of work and didn't help my career, at least not initially.

After finishing my PhD, I obtained a job as a research assistant in applied mathematics at the Australian National University. It suited me well. I could do the mathematics work and had plenty of spare time to be active in the environmental and peace movements, which was what I cared about most. I would have been happy to spend my entire career as a research assistant, being an activist on the side.

However, it was not possible, because I didn't have a permanent position. I was on one-year contracts, and over the course of ten years I was terminated three

[1] Kelly McGonigal, *The Upside of Stress: Why Stress Is Good for You (and How to Get Good at It)* (London: Vermilion, 2015).

[2] Jonathan Haidt, *The Happiness Hypothesis* (New York: Basic Books, 2006), p. 151.

[3] Brian Martin, *The Bias of Science* (Canberra: Society for Social Responsibility in Science (ACT), 1979).

times. I applied for permanency as a research assistant, but this was denied. Strangely, being prevented from having a low-level post pushed me to move up in the system.

Luckily, I obtained a lectureship in science and technology studies here at Wollongong. What helped me get the job was all the studies and writing I had been doing on the side for over a decade previously.

The lesson I learned was that if I did what I believed in, this was more important than career success. I would have been happy either way, as a research assistant or rising through the academic ranks.

Somewhere along the line, I started writing regularly about the things I cared about: the politics of science, environmental and peace issues, dissent and whistleblowing. Writing didn't come naturally. In high school, mathematics and science were easy for me but writing essays in English classes was really hard. But because there were things I wanted to say, I kept writing and kept trying to improve.

Two things really helped. One was setting myself a target number of words per day. The second thing was sending drafts of my writing to others for comment. I learned an enormous amount from their generous feedback.

Years later, I discovered research by Robert Boice and Tara Gray showing that regular writing greatly increases research productivity.[4] I started following their recommendations, and before long was writing about 20 minutes and 300 words per day. It was a lot easier than my previous approach, and just as productive. It doesn't sound like all that much, but it mounts up. After a year, that's 100,000 words. And you thought a 5000-word essay was long.

So here I was, writing lots of books and articles, yet I knew this wasn't due to natural talent but instead to continual effort and feedback. With this background, I discovered research on what's called "expert performance," which is the capabilities shown by top performers in classical music, sports, chess and just about any field where advanced skills are required. The research suggests that anyone who wants to be really good at something needs to spend lots of concentrated effort practising, with a focus on addressing weaknesses.[5]

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[4] Robert Boice, *Advice for New Faculty Members: Nihil Nimus* (Boston: Allyn & Bacon, 2000); Tara Gray, *Publish & Flourish: Become a Prolific Scholar* (New Mexico: Teaching Academy, New Mexico State University, 2005).

[5] Anders Ericsson and Robert Pool, *Peak: Secrets from the New Science of Expertise* (London: Bodley Head, 2016).

That's what I had been doing for many years with my writing and with my exploration of all sorts of topics.

I realised that nearly everyone — certainly anyone able to attend university — has the capacity to become exceptionally good. How do you do it? Practice, practice, practice, under the guidance of a good teacher or guide.

Undergraduate studies are only a beginning. If you want to really make a difference, persistence is required, and this means you must really want to improve, and put in effort over the long haul. In principle, anyone can do this, but only a few put in the necessary effort.

Unfortunately, there are a lot of companies selling products that undermine this sort of long-term effort. Facebook, texting and video games are the enemy of focus and persistence. These and other distractions are becoming increasingly sophisticated in capturing attention.[6] So if you want to make the most of your capacity, you need to create a personal environment that insulates you from attention-grabbers and enables you to follow your own path. I wish you all the best in doing that.

[6] Tim Wu, *The Attention Merchants: The Epic Scramble to Get Inside Our Heads* (New York: Knopf, 2016).