# How can engineers help me to become a wise global citizen?

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If we want to heal the planet then we need to begin working with the positive forces that already exist. Moving away from the current unsustainable guiding principles of strategy or growth, towards health, personal and global isn't easy, although now that Barack Obama is President elect of the USA, everything seems more possible.

Many of us live in societies that encourage us to believe that the planet's resources are there to serve 'limitless' wants and manufactured needs. Scientist Richard Eckersley explains that we have created these by turning the seven deadly sins, greed, lust, laziness and so on, into the seven marketing imperatives. Despite this, many of us also realise that the planet's resources are finite and strained and that we have to change our values if we want our civilisation to continue. Becoming a wise global citizen means moving away from a 'what's in it for me' culture to a 'we're in this together' culture based on partnership not domination. This challenges perspectives and values.

As a university teacher, I want to contribute to healthier, healing futures. By chance, I became involved with first year engineering students. The teaching team wanted to improve their communication skills, break down some of the perceived gender and ethnic barriers and introduce principles of sustainability. Communication skills included written and oral skills and interpersonal and cross-cultural communication. As long as engineering discourse continues to denigrate these as 'soft' skills, there is little reason for students to respect their importance. Since "soft" is usually a feminine attribute, this also makes it harder for women to become part of this engineering culture.

Most engineering students come from a wide variety of ethnic and cultural backgrounds and, in Australia, include many international students. Although the presence of diversity is widely believed to create better cultural understanding, it doesn't just happen. It is hard for students to cross gender, age and culture barriers without active support from teachers. By sustainability, we meant moving beyond an add-on, token acknowledgement of the widely accepted Brundtland definition that sustainability means meeting "the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 8). It is also unfortunate that sustainability has been welded to words such as 'growth', 'consumption' and 'development', which have caused many of the problems. A more appropriate ethic is what the sustainability scientists call interconnectedness, based on taking responsibility for "the well-being of others, nature and future generations" (Raskin et al., 2002, p. 56).

The initial responses to these topics and the methods, including a reflective journal, were disheartening. Everyone, they assured us, hated the work and couldn't see why engineers had to engage with such 'crap'. And yet, when I read the journals of this diverse group of students, mainly male, but from over 30 different ethnic backgrounds and including international and mature age students, signs of growth shone through.

Six years of research helped me to understand what was happening and to improve what I taught and how I taught it (Kelly, 2006). I used student interviews to help me understand what changes took place, what blocked them, what helped students to grow and how they grew. The unit of study was far from perfect and poorly supported by other engineering faculty but still students changed. The data showed that far from "everyone" hating what we did, around 65% accepted it, willingly, "I'm really looking forward to this", or grudgingly, "I'll give it a go". 25% were converts, who hated it at the beginning but understood the benefits at the end. For some of these the change was transformative.

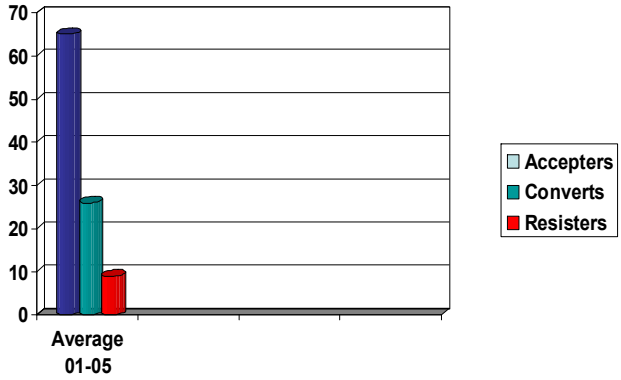


Table 1: 'Transforming Learners' 2001-2005 (Kelly, 2006)

*Resisters and 'resistings'*

The problems lay with the disproportionate influence of the around 10% who, for various reasons, resisted all the way. Resisters are so "loud" in their resistance and criticism that we assume "everyone" feels the same way. "Arrogance" and "contempt for non-technical material" have been identified as lingering aspects of engineering culture, but similar attitudes are recognisable in every organization or group. What we and they need to realise is they do not speak for all students (or staff) and that they have to respect others' right to change.

I also moved past seeing these students as "resisters,' with all the negative connotations of that label. Identifying and understanding the causes behind 'resistings' in any situation, can help us to work more effectively. For example, some of the engineering resisters were scared of writing because they had been criticised for poor writing at school. The findings are useful because resistance to challenging the dominant culture is not peculiar to western systems. India, for example, is trying various approaches to improve the participation of women and minority groups in engineering and academic life generally.

I identified the following stages in interviewees who changed, not necessarily in this order. Students first got connected, to the topics and to others; they got respect, for themselves and others; they got insight; they got inspired; they got healing, from damaged self-esteem, from being racists and from feeling victimized by racism; and they got transformation. These were expressed as the six qualities that mark a wise global

citizen. I have explained these in Table 2 below, with an example taken from student interviews to demonstrate how they expressed them.

Table 2: Globo sapiens' qualities (from Kelly, 2008)

| GLOBO SAPIENS' QUALITIES | EXAMPLES FROM INTERVIEWS |
|---|---|
| 1. Empathy with and sensitivity to other ways of being and knowing | *Actually I think that I was probably a bit racial, I think. So I'm sort of not like that any more. I didn't realise that I was [laugh] but I sort of was. [Yamaha]* |
| 2. Global consciousness | *…if I was to, I don't know, invent something that before I give to anyone else I'd sort a think about the bad ways as well, how this could be used against, against people, how it could be used against our ways of living, how it could alter the world for good or bad. Yeah, it just helps you be mindful of life. [Gir Bob]* |
| 3. Being capable of trans-generational thinking, past and future | *To me, environmental principles represent the ethics that engineers have regarding the environment: being aware of the impact that we have on the environment, its sustainable development and so on. Sustainable engineering means looking after the earth for future generations: making sure that we don't waste the world's resources, looking after the flora and fauna for generations to come, and investing in the future. [Fiza]* |
| 4. Having courage | *Engineers hold great responsibility in the development and implementation of new products and technologies thus the need to put the livelihood of people and the environment first is important. We need not only to ask, as an anonymous person said, "Can we do it" but also, "Should we do it?". (Male, NESB, 34, 2002)* |
| 5. Being able to contemplate changes to their current way of life | *It may not help me or my career prospects, but it will make the world a better place… if someone wants me to do something that I think's environmentally unsound 30 or 40 years down the track I don't want my children or their children having to suffer for something that I made or I signed off on. [Peter Parker]* |
| 6. Working towards healthier futures, from the personal to the spiritual. | *You haven't got the inner demons… Reflective journal stuff brings it down to a more inward, inner kind of level …it affirms your convictions, you're more at ease with how you feel… gives you a sense of inner worth. [Spontaneous Combustion]* |

*Wanting to make a difference*

The hopeful message is that so many students wanted to work for a better future, even at the expense of their own privileged way of life, and were relieved to get support to say so. Wanting to make a difference is an emerging, healthy but still muted discourse. Recently I revisited engineering education, looking at an Australian report and a national newspaper advertorial trying to attract students to engineering as a career. The underlying myth of the education report is a 'business as usual' future in which the planet is a market place where engineers make it, sell it or fix it. The advertorial's myth is worse, seeing the planet as an open-cut mine. Engineers are depicted as well-paid cogs in a boom machine which is based on consume now, pay later.

In the face of powerful overt and covert institutionalised resistance and counter-messages we need Globo sapiens' courage to make conscious and *self*-conscious efforts to change what we say, write and do. At work and in our personal life, we can use our authentic voice, however small it seems, on behalf of each other and the planet. As Globo sapiens we won't just be a civilising influence because we are doing better things differently. We will *be* different.

**References**


Eckersley, R. (2004). *Well and Good: Morality, meaning and happiness*. Melbourne, Australia: Text Publishing.

Kelly, P. (2006). *Towards Globo sapiens: Using Reflective Journals to prepare engineering students able to engage with sustainable futures*, from http://adt.library.qut.edu.au/adt-qut/public/adt-QUT20070403.150024/

Kelly, P. (2008). *Towards Globo Sapiens: Transforming learners in Higher Education*. Rotterdam: Sense Publishers.

Raskin, P., Banuri, T., Gallopin, G., Gutman, P., Hammond, A., Kates, R., et al. (2002). *Great Transition: the promise and lure of the times ahead*. Boston: Stockholm Environment Institute.

WCED, World Commission on Environment and Development. (1987). *Our Common Future (The Brundtland Report)*. Oxford: Oxford University Press.



Patricia Kelly is an Australian futurist and education consultant who works on academic staff development projects at several Australian universities. Her work with engineers was published in 2008 as '*Towards Globo sapiens: Transforming Learners in Higher Education* (Rotterdam, Sense Publishers) and as a chapter in Bussey, Inayatullah and Milojevic, eds., *Alternative Educational Futures*, 2008 (Rotterdam, Sense Publishers)