A R T I C L E

.1

Learning for Sustainable Futures: One Intervention*

Patricia Kelly
Queensland University of Technology
Australia

Abstract

The planet needs more wisdom, not more 'one minute managers'.

As a teacher in Higher Education in Australia working with large, diverse cohorts of first year engineers, my task was simple! I wanted to set up a welcoming and respectful context for all students; to help students to communicate more effectively in writing, orally, interpersonally and interculturally, about issues I believed were important in the 21st century; as developing professional engineers in a globalised context; but in such a way that they would be able to contribute to alternative sustainable futures.

One of the challenges for critical futures educators is that values we may weave in teaching time, are unpicked or at the least frayed, by omnipresent, seductive and better resourced messages dedicated to the short term, individual 'right' to limitless consumption. At the deepest level, I hoped that the unit I taught in would be a source of intellectual and spiritual sustenance for students faced with complex, uncertain but demanding futures.

I used Reflective Journals as a core pedagogical intervention and my research has shown that many students have become more aware and able to think critically and assume responsibility for themselves, their impact on communities and the planet. I have identified some qualities of such Globo Sapiens, but in order to understand how such changes were occurring or being resisted I needed methodologies compatible with an age of meaning. The metatheories and methodologies of Sense-Making and Causal Layered Analysis have enabled me to design curriculum and research that focus on "connectings", what is blocking students or helping them to change and grow and at what levels. I now see not just 'who' students are, but where they are and my part in the process, a humbling parallel personal journey into reflexivity. As Tony Judge advises "without our own personal harmony we cannot assume responsibility for guiding the biosphere."

Introduction

The planet needs more wisdom, not more 'one minute managers.' What does wisdom mean? It is a timeless but neglected concept that can be reworked to support healthier futures. It is also a cross-cultural concept with possibilities for our mutual enrichment. Brennan contrasted the "practical or strategic cleverness" of modernity with wisdom or "sapientia", which is more "a form of moral imagination" (Brennan 2005: 28). His "five pillars" for a wiser vision were:

- "the rediscovery of subjectivity and dignity" upon which ethical and environmental agenda depend
- the awareness of the historicity of values and the ensuing recognition of memory as the explanatory background to human actions...
- dialogic imagination, which goes beyond reflexivity in its capacity to get inside the situated and historical experience of another"
- "the importance of articulating and recognising limits and boundaries, "without which there is no difference between fair and foul, truth and lies (Brennan 2005: 28)
- conscience, a moral awareness...derived from an autonomous, inner voice" (Brennan 2005: 29).

How can we support such wisdom through our lives and work? A more important question may be, what happens if we don't? Kunstler warned that "we are about to enter an era of tremendous trauma for the human race" (Kunstler 2005) and "Sustainability Scientists" have already stressed the need to educate "sustainability professionals," who can support a Great Transition to sustainable futures (Raskin et al. 2002). For the last six years at QUT, I worked with a large socially and culturally diverse, compulsory first year Engineering unit, Professional Studies, BNB007. There were 350+ students, including up to 20% International students, 5-10% female students, ~15% mature-age entry students, domestic students from over 30 different ethnic groups and

from most world religions, in keeping with Australia's cultural diversity.

In this diverse Higher Education context, I wanted my Reflective Journal section of the one semester unit to establish a welcoming and respectful learning environment; to help students to communicate more effectively orally and in writing, interpersonally and interculturally, about issues I believed were important in the 21st century, as developing professional engineers in a globalised context, but in such a way that they would be able to contribute to alternative sustainable futures. My situation was not ideal, so it was arguably a stern "real world" test of any teaching strategy designed to contribute to the sustainability education we need if our societies "choose to survive" in the 21st century (Diamond 2005). In Sterling's terms, sustainability education is a transformative learning response that subsumes education about sustainability (the facts) and education *for* sustainability (the values and capacities) into a "reflexive and participatory process" (Sterling 2001). Ideally this would involve the "whole person and the whole learning institution" (ibid) in education as sustainability.

This paper summarises some relevant findings from my PhD study[1], which asked as a main question, "Were Reflective Journals an effective strategy for supporting change and transformation with large, diverse first year engineering cohorts? I do this under the headings, 1. Using Reflective Journals, 2. Student Responses, 3. Effective Strategies and Approaches, 4. the qualities of Globo sapiens and 5. some Teaching Implications. I begin by explaining what Reflective Journals were in this context and some benefits and concerns about using them as a teaching strategy, particularly in a vocational context such as Engineering education.

1. Using Reflective Journals

Reflective journals are not new but are seldom used in an undergraduate engineering context. Although they should be used with caution, (Boud & Walker 1998) they can support transformative learning, as well as contribute to improved communication skills. One identified problem was that reflective writing and under-

standing does not come readily to our students and graduates (Bolton 1999: 203). Students also complain that they are time-consuming. The time issue can be seen as part of the "hurry sickness" encouraged by the current economic paradigm. Another issue is the tension between the need to assess journals and avoiding such detailed criteria that they destroy creativity and reduce the journals to a tick-the-box activity. They can also be misused by lecturers in ways that are insensitive or could lead to abuse of power (Boud & Walker 1998). Positive effects reported from using Reflective Journals include increased self-esteem, self-understanding, deeper understanding of issues, and enhanced written and oral communication skills (Beveridge 1997; El-Hindi 1997; Tuan & Chin 1999; Walter & Finney 1999).

I next consider student responses. I wish I had these understandings *before* I used an innovative strategy like Reflective Journals. The issue of the effect of negative responses to innovative teaching of this kind on other students and on staff needs more research. It is underreported, I suggest, because students do not wish to look "uncool" by liking such programs or to become the target of more negativity from peers. Teachers are also under huge pressure, from students and their superiors, to appear to have their teaching "under control". The shattering personal effects of disrespect can be a source of huge stress for new teachers in particular and forms one of the "dirty secrets" of teaching in Higher Education, rather like child abuse before it became acceptable to report it. In my experience, secondary schools provide much more accessible support to teachers than higher education does.

2. Student Responses, "Accepters", "Resisters", "Converts"

I had no preconceived ideas of students' responses to the Reflective Journals, but the terms Accepter, Resister and Convert gradually emerged. The table below offers characterising words and comments for each group, taken from student journals[2].

Table 1: Student response categories with examples

Accepters	"Positive"
	"Hope"
60%	"Try"
	"Success and happiness"
	"Prepared to give it a shot"
	"Going to try my best"
Resisters	"Waste of time"
	"Hypothetical garbage"
10%	"Annoying"
	"Pain in the neck"
	"A joke"

3

Converts	"My initial thought on the reflective journals was not a joyful one … I now consider it a worthwhile exercise". "I must admit that I was a sceptic at the beginning of the semester, but I have been converted. Hallelujah! "
30%	

It would have helped to know this when I began this work, because the "impression" created by the dominant 10% was that "everyone hated the unit" and the Reflective Journals in particular and thought that they were "airy-fairy" and a "waste of time". The other common belief, among students and staff, was that students only "wrote what they thought we wanted to hear". I return to this point in the conclusion. The numbers in these categories proved remarkably consistent each year of five years at ~60% Accepters, ~10% Resisters and ~30% Converts. Accepters can be "willing", and embrace journals from the beginning, or "grudging", in that they express doubts but are willing "to give it a go". Resisters can be "angry", "arrogant" or "unthinking," separately or in combination. The third Resister sub-category claimed to have gained as a result of studying BNB007, but then proceeded to list numerous and/or significant changes they had noticed in their understandings and approaches to various topics and issues and themselves[3].

Resisters can be disturbing, from a teacher's point of view and for other students, because they represent the dominant view with such certainty that other students tend to believe it as well. Brice's change management "Virus" model (Brice 2004), described briefly below, is also relevant. Brice, a manager of a large Australian company, used a "Virus analogy" to compare changing organisations to a community of cells, rather than a top-down pyramid. Thirty percent of any group need to be potential "Viruses" who can bring about rapid change (Brice 2004: 77). There are also the "Antibodies", who "not only resist the change", they attack and undermine the Viruses in overt or covert ways. She warned it only needed 10% of Antibodies to defeat the *Viruses* or render them inactive (Brice 2004: 78). This was certainly true of the role of Resisters in BNB007 in the early years. Her model is similar to diffusion of innovations theory, used in community education schemes relating to sustainable practices (Guerin et al. 2001; Taylor 2005: 8). Such differences are part of a normal environment and people can hold more than one of these positions in relation to different issues. A similar group of 15% "least amenable" to change have been identified in the general population and labelled "laggards" (Rogers 1962; 1995, Taylor 2005: 8). In a healthy environment, there is an optimal balance[4]. The early years of BNB007 suffered from an imbalance in that the Resisters (Antibodies) assumed control. The in-depth interviews revealed the powerful impact that their certainty and negativity had on other students.

From Resisters to "Resistings"

The study and Sense-Making guided interviews changed my thinking. I no longer think it is helpful to think of Resisters, with the capital letter creating an inescapable and blaming "label", but of "resistings", which result from individual responses to a variety of situations. Students are "themselves sites of power, to resist, reinvent, challenge, deny, and ignore" (Dervin 2003: 142). Resistings were one important set of responses and I now understand better what drove them. However, teachers and these individuals need to become aware and to understand that Resisters are not THE voice of any [engineering] cohort. Knowing more about some causes of fear, anger and frustration may help to reduce the stress of teachers setting out to bring about similar changes. This should not only reduce the personal anxiety of working with "resistings," but in BNB007 led to alternative strategies and approaches that averted the most negative manifestations and their equally negative responses.

The biggest fear was writing itself. Some students confessed to have done engineering specifically to avoid it, although this is not the professional reality. Many had internalised past criticism that led to lack of confidence, fear, resistance and understandable unwillingness to try again. Identified fears included those of mature-age students entering from a trade background, who had not written for years and the "walking wounded" from unsupportive high school English experiences,

> ...my English teachers never did give me positive feedback, it was always "no good" and never offered any assistance (Male, 17, ESB, Accepter 2002)

Many students from Non English Speaking backgrounds, either international or domestic, feared, correctly or incorrectly, that their English skills were weak. They had not received incentives or support to move to a new level of competence. Others felt that their English skills had "gone down the drain" as a result of lack of use in their engineering subjects to that point. This should be a concern in itself. Some had negative previous experiences of writing reflections and had to overcome this barrier, which led initially, to some condemning the strategy to others.

Using Sense-Making methodology, the 26 interviews with students from all categories revealed enormous efforts to make sense of their learning and over 200 questions emerged, representing their perceived barriers to learning. The main questions, over half, were "What" and "How" questions which related to Getting Started, the Relevance of the task to Engineering, or of the chosen topics[5] and readings, Expectations, theirs and ours, How to Write, and Assessment (how could we assess their thinking?). They needed much more support at the beginning of the journaling process and acknowledgement and empathetic understanding of the culture shock that this task posed, for engineering students in particular. I tried to address these issues in a light-hearted way through the introductory lecture, a web-based guide, regular notices online, a discussion line for students to seek information from each other and being available to answer questions by email.

3. Effective Strategies and Approaches

Significant changes and transformation occurred for many students in this study, not just through the Reflective Journals, but because the learning environment supported and encouraged them. I summarise these inter-related background elements and practical strategies as:

Element 1: Integrate valuing and respecting diversity

The BNB007 unit outline and website formally acknowledged and welcomed the great diversity within the cohort itself and encouraged students to consult family and community as valued, valid sources of information and wisdom[6]. Formal curriculum statements are needed to move lecturers beyond "accommodation - if pushed" to integrating diverse perspectives because this is appropriate and effective pedagogy for all students. We embedded this approach in assessment, lecture content, lecturer/tutor attitudes and in tutorial and project

design. Students may then feel confident enough to incorporate their cultural or gender-based or other experiences as a natural part of their work.

Element 2: Engage with others and with ourselves as other

Strategy 1: Find a Person Who...
Strategy 2: Early Lectures on Cultural Sensitivities, Intercultural Skills and International Responsibilities

We took responsibility for creating an environment which supported cross-cultural communication, in those areas we influenced. The first tutorial with its getting to know you activity, "Find a Person Who"..., early lectures on cultural issues, the Peer Interview and the team-work project worked together to helped many students out of their comfort zones to acknowledge not just the "other" but that each of them was "someone else's other" (Ellsworth 1989)[7].

> *"Tutorial Activity 1, "Thinking about Learning" helped me to relies my feelings on learning, writing, speaking and working with others. It is unusual for me to answer questions which contain such phrases as "my biggest problem is", "I feel", "I am most challenged by", "I am also concerned about". Being a person that keep his feelings pretty much to himself it is odd to suddenly write them down or "put them on paper." (Male, ESB*, 2001: 19)[8]*

There was evidence (from surveys, journals and interviews) that in relation to cultural sensitivity, the unit content and approach was very effective in changing attitudes. Its intended anti-racist stance was clear and this had positive effects on domestic and international students from NESB's and ESB's. It gave courage to students who had been victims of racism and it made some did not want "to be racist," more mindful of their privilege in realising that "other people suffer, not me".

Element 3: Has an ethos that encourages trans-generational thinking

Trans-generational thinking means "preparing students to be knowledgeable and respectful participants in [the] process of carrying forward (which means both to conserve and to renew) memory that will serve as a guide to the future" (Bowers 1995: 177). I used examples and role-models in written or visual resources, which engaged respectfully with the past as a source of wisdom.

> *What you are doing to the land and environment will have a great effect on future generations and it is very important that you keep it in mind. The world is not yours to take but for every of all generations to look after and enjoy. (Male, ESB, 2001)*

Element 4: Scaffold learning

Strategy 3: The Template
Strategy 4: Thinking about Learning
Strategy 5: Personal Learning Agreement
Strategy 4: Peer Interview
Strategy 5: Formative Feedback

Writing Reflective Journals required a) writing, b) a new genre of writing and/or c) one expressed in students' second or other language. We wanted the content and process to support students to develop the writing and thinking skills they needed, not just for their profession, but for their own self-confidence. The website offered a template for the first journal with open ended sentences to help students begin, if they wished to use it. This was not a "recipe" but scaffolding for those who needed it. The first journal described who they were and what they learned from the first tutorial activities. This included the "Thinking about Learning" activity, a questionnaire about how they learned and their communicating strengths and weaknesses, and a "Personal Learning Agreement". Students had to create five personal guidelines from a suggested Code of Conduct, based on respect for others and for the earth and "all living creatures". Most students really liked the fact that they had to create their own agreement. It was not imposed. It gave them motivation and introduced many to a basic understanding of "futures thinking".

> *Instead of feeling like you might be a small entity who goes to uni every day you can see your place in society and with that comes responsibility for your actions as a*

6

citizen and as a professional (Male, 24, Accepter, ESB 2001).

In a cautious response to what I perceived as general resistance to "touchy feely" activities, I originally limited the journals to being read by the marker. Student interviews convinced me that they were very interested in what other students wrote and from 2002 I introduced the Peer Interview, which proved to be one of the most popular and healthy aspects of the journal process. They interviewed a peer "from a discipline or background different from their own" and shared their journals and their learning to that point. As hoped, the Peer Interview

- encouraged many students out of their comfort zones to meet and interview someone from a different gender/background,
- helped them to engage with an alternative view of the lecture and reading material to that point,
- required them to explain their own learning and thus engage with it differently,
- gave them an opportunity to learn or to improve how to give and receive constructive feedback
- made plagiarism difficult, as students needed to include information about their interviewee and their journals and,
- enabled students to get feedback from their peers before they handed in their journals for formative feedback from the markers.

I believe that the interview has been helpful and may help to make it easier to talk to people I have never spoken to before. Usually, I only talk to them if I have to work with them as part of a group based assignment / project, of which I have several this semester. Maybe now, I will [be] more at ease communicating with other people (Male, ESB, 19, 2001).

Some students were astonished when they realised that other students took the journals seriously. It had the effect of weakening the myth that everyone "hates" reflective Journals and that saying what you think or feel is not "cool". This was reinforced by the Formative Feedback in Week 5, in the form of detailed corrections and constructive criticism and encouragement, which, when done well and efficiently, created a link between marker and student and showed students that they were being listened to and taken seriously[9]. One marker called this electronic relationship "an interesting intimacy". I encouraged students to develop "their own voice" and to practise Plain English, as one element in a "sophisticated range of writing and communication skills" they will need in professional life (Thomas 2004: 40).

Reflective Journals occasionally served as a life-belt for students who, for various social and/or cultural reasons, felt they had no-one else to turn to. This disturbing conclusion is supported by Australian research in which almost a quarter of high school students (13-15) "said they had no one to talk to if they were upset, no one they could trust and no one to depend on" (Eckersley 2004: 154) while "those aged 18-24 had the highest prevalence of mental disorders" in the preceding twelve months (Eckersley 2004: 154). This is not peculiar to Australia.

The Peer Interview, coupled with the teamwork required by their project, encouraged students to focus not on difference but, on "how people connect; how they construct bridges and what accounts for differences in observations" (Dervin 2003: 7). It enabled students to ascertain how others saw them and their work and equally importantly, how others saw themselves.

5. The benefits

Students identified a range of benefits from writing Reflective Journals.
1. Increased competencies
    a) Improving writing and communication skills in students with varying levels of skill and experience – domestic and international.
    b) Increasing confidence, in themselves and their communication skills, oral and written
2. More supportive relationships and environment

a) Increasing understanding and decreasing perceived barriers between domestic and international students and between genders and ages.

b) A healthier learning environment that supported transition to university, regardless of mode of entry.

To summarise, this Reflective Journal process helped most students to integrate their learning into their lives as developing globally competent professionals. Many of these also showed evidence of being able to think critically and be willing to assume responsibility for their impact on communities and the planet as *Globo sapiens* or wise global citizens. Some had already made intellectual or actual commitment to personal actions for change. Changes at the latter levels are regarded as transformation (Barnett 1997; Mezirow 2000; Rogers 1996).

6. The qualities of Globo sapiens

Although useful, the skills and qualities identified with the concepts of global portability, *Homo economicus*, and Global competence or *Homo globalis*, lacked the necessary integration of values, ethics, responsibility and reflexivity with a futures focus that I sought. Like sustainability, *Globo sapiens* (Malaska 1997) is an evolving, guiding concept, not an end in itself[10]. At the least, *Globo sapiens* will be reflective, reflexive citizens/professionals connected by a common sense of global responsibility and a willingness to act accordingly in their integrated personal and professional lives. The characteristics suggested below emerged from the literature but the students' journals and interviews across cultural, gender and age groups brought them to life.

Quality 1: S/he will be "...sensitive to the different ways we learn from each other and know the world" (Inayatullah 2002: 121) and able to exercise imagination in order to "feel for and with the other" (Brady 2004: 55).

Empathy and intuition are important for reflection and transformation (Taylor 2000: 303). Some engineering students, male and female, admitted they had great difficulty expressing feelings. Several had to acknowledge that they "had feelings" before they were able to relate to other people in a first tentative step. Being able to feel empathy is equally important for relating to the environment (Belenky et al 1986, cited in Mezirow 2000: 14). This quality "also spurs a demand for change since it enables us to choose against the grain of habit and power" (Brady 2004: 55). For this reason, Quality 1 is directly connected to Quality 5, Courage.

Quality 2: S/he will show evidence of global consciousness

Many students demonstrated that they are on the way to showing a degree of "global consciousness". This has two elements, "expansion of consciousness beyond the confines of an egocentric sense of self...and a functionally adequate awareness of ecology as a whole system of physical and non-physical interactions across time" (Markly 2002: 340). These are illustrated in the following interview excerpts.

> *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)*
>
> *It drives you to find out how you yourself can improve, do your little bit to help the planet survive, to make it sustainable for many generations. (Clarke)*

Quality 3. S/he will be able to contemplate changes to their current way of life, rather than taking its continuation for granted.

Changing our thought processes and values to develop an ecologically sustainable culture, "would represent the abandonment of the middle-class vision of unlimited economic prosperity and technological progress" (Bowers & Flinders 1995: 230). This may be the most difficult change for privileged young people to contemplate, since they are surrounded by images

and messages telling them that escalating consumption and a universal "no-limits", business-as-usual future is their rightful reward for a university degree. Yet this change of culture is exactly what is necessary or overdue in response to "scary" reports such as Climate Change (2004) and the Millennium Assessment (2005). "These reports pose a particular challenge for engineering and are a call for us to rethink the whole culture of engineering and practice" (Hood 2005: 2).[11] This interviewee had reached the same conclusion.

> 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][12].

Quality 4. S/he will be capable of trans-generational thinking.

As well as engaging and re-engaging with their own and others' cultural background/s, many students now recognise and understand the concept of Future Generations. Integrating the past, present and future is part of understanding time as a spiral, in which we can learn from both the past and the future to inform a better present (Inayatullah 2002: 19).

> 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)

Quality 5: S/he will be a person of courage

Courage is emerging as possibly the most demanding quality for Globo sapiens - and their teachers, in the 21st century. Barnett acknowledged that "Finding one's own voice and

expressing it – in thought and in action – requires the moral virtues of courage, independence and persistence" (Barnet 1997). Meadows *et al* (Meadows 2005: 270) also warned, "It takes courage and clarity to challenge an established system. But it can be done." They remain optimistic. However, courage can mean different things at various levels of understanding and personal development. This study confirmed Lucas's (1994) doctoral research (Taylor: 318). In relation to successful transformative learning, she identified "four types of courage: to be, to believe, to feel and to do". So, for example, students showed courage in questioning themselves.

> "It made me say, you're going your own way, you've got courage...I'm not so frightened to learn to know someone else [Yamaha].

Students were also aware of the "courage" that they will need to live an ethical life.

> It has now become clear to me that to be a professional is not just a sometimes thing. It requires you to dedicate your life to excel in your chosen field, in my case electrical engineering. You have to have the courage to stand up for what you believe in while at the same time not disrespecting people of your same culture or different cultures (Male, ESB 2004).

At the highest level, there is both a critical and an empathetic dimension.

> 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, Mature Age, NESB 2002)

6. He/she will work towards healthier futures, at various levels, from the personal to the spiritual (Inayatullah, Lowe).

Inayatullah urged "health and healing" as the defining dimension of the "next five hundred years", replacing "strategy" (Inayatullah 2002: 142). This quality has two aspects, aware-

ness and action, since we have to be able to imagine "a healthy self" in order to bring it about in our local and global environments (Inayatullah 2002: 142).

One of the main positive outcomes that emerged from the interviews was that, in Sense-Making terms, as outcomes of bridging the gaps they faced, students "Got Connected"- to themselves, their feelings and needs, to others, whether their peers, families or cultures, to the Engineering profession, to the world and the planet itself. Other important outcomes included, "Got insight" mainly into self and others, "Got inspired" by lectures, peers and readings to see and do things differently, "Got courage" and for some, "Got transformation". They saw responsibility in terms of 'us' and our responsibility, not 'them' or someone else's job (Eckersley 2004: 254). For some students, this connecting was the first step to "healing" of self and others and the planet, as the two examples below indicate.

> *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]*
> *It [the Peer Interview] was ... so different to what I had written and to what I thought Reflective Journals meant ... here were his feelings, and here was what went on outside and mine were about here [indicated a low level with hand] and his was about here [indicated heart level]. It was really close to what he was feeling and I found that very profound cause it was, yeah it was inspiring... it encouraged me ... to try to get in touch with what I was really feeling about the issue. [Lady Arwen]*

People "are looking for a different paradigm, a new vision of where we want to go" (Eckersley 2004: 242). For these students, BNB007 and the Reflective Journals played a part in their search. This quality also justified my positive response to the "oasis" (Boud & Walker 1998) as the guiding metaphor for the learning atmosphere I wanted to create in person and online for these students. By oasis, these

authors meant a "micro-context" with "a different atmosphere" within which students could "act out of different attitudes and values" (Boud & Walker 1998).

4. Implications for teaching

Students will feel more confident to develop the qualities of *Globo sapiens* if we model them through the environments we create and through our own behaviours. Desirable teacher qualities have been identified as "supportive, clear, facilitative, interactive" (Bolton 1999) as well as "trusting, empathetic, caring, authentic, sincere, and demonstrative of high integrity..." (Gallagher 1997: 313). This supposes that we ourselves are globally competent practitioners prepared to engage with difficult democratic and ethical issues (Badley 2000). Badley accepted that "managerialism" had "diminished" the qualities teachers need for this and that they will need support and encouragement from visionary leaders. It "needs courage to take risks in modern society" (Kenny 2004: 83). By risks she meant speaking up for policies based on long-term thinking that may jeopardise promotion in a society based on short-term gain. Meadows et al agreed it is difficult to put forth new information in a system that is structured to hear only old information (Meadows 2005: 270). This is a site of increasing tension for teachers in Higher Education. Teachers engaged in this work need support and examples to learn from in order to avoid 'burn-out'.

What would help?

Above all, we needed *"senior management to come out and say quite openly that this unit was important to their professional development and they should take it seriously and realise that without that they're not going to make very good engineers".* [Georgia[13]]

Student fears and doubts should have been addressed much earlier in the process by a senior academic stating clearly that the unit had faculty support and that the students' chosen profession also supported its ethos and anticipated outcomes. Adult education is not about indoctrination (Mezirow 2000). However, education is about being allowed to engage in

learning. Mutual respect is a basic element of the open and democratic learning environments that are essential for transformation.

Disrespect disheartens staff as well as other students. Positive role modeling is a simple, cheap and effective way supporting teaching staff in such units by establishing a mutually respectful basis for dialogue. We did not have this advantage. *"I even know that there are lecturers who think that BNB007 is a failure to begin with, which initially I agreed with when I first saw the subject"* (Zaeris).

5. Was it "airy-fairy" and a "waste of time"?

In order to demonstrate that the Reflective Journals and the interviews that the teaching environment and strategies provided *precisely* the personal, academic and professional benefits that students and staff doubted most, I collated the initial Expressed Doubts of the interviewees and compared them with their later Experienced Reality as the brief sample in the following table show.

Table 2: Examples of Expressed Doubts and Experienced Reality

"Waste of time" [Lady Arwen, Bo[14]]	"Took the 'hoodoo' [from my bad experiences in Nursing] on the word Reflection away" [Bo] I thought I can do this in other subjects as well" [Lady Arwen]
"They only write what they think you want to hear" [Engineering academic to "Paris", a tutor]	"They're not ideas that other people regurgitate because you're reflecting and you come up with your personal taste on it too. And it's just, I think it it's powerful". [Alex]
I thought a professional engineer was an ideas man, b. a number cruncher and then c. the overseer, the guy who makes sure his idea actually comes into implementation and what he saw when he had the vision is actually being built out there [Clarke].	"…in this day and age to be a sustainable engineer is the only way you can be… those ideas you come up with will have to be sustainable ideas and then when you crunch those numbers you'll get an answer that will have to be sustainable…[Clarke]

Becoming *Globo Sapiens* involves life-long learning and un-learning for LIFE itself. Yet, despite the challenges involved, many students took Dator's first step towards "reconceptualising environmental values in a globalising world" (Dator 2004: 230) by recognising their "perpetual responsibility" for the Earth. Many also took his second step in developing "an ethical perspective that furthers our acceptance of that responsibility" (Dator 2004: 230). They now need the critical third and fourth steps that will support their continuing development, that is, "envisioning and creating" institutions "that make it easier to accept, rather than to reject...responsibility for the Earth the human species dominates" and finally, the "hard" work of creating and evaluating them (Dator 2004: 230) in the short time available before events, seen and unforeseen, may close off this option.

I believe that educators will be under increasing pressure to play a key role in the values transition our societies need. Working with large numbers of first year engineering students meant that my work was grounded in "the structural realities that set limits on real people in real institutions in everyday life" (Apple 2001: 99 in Singh 2002: 227).

Conclusion

What did I learn? By engaging with and jettisoning internalised personal and institutional judgements, *I* became *less judgemental of* the *students*. Knowing the my actions supported most students, *I had more courage to model respectful assertiveness on behalf of* stated core *values* and to *ask for* and expect it *in return*. *By being less threatened* by the connotations of "Resisters" and "Resistance", *I was genuinely interested in* the source of their "resistings" *and* confident that *I could find better solutions or alternatives* to instances that arise. I also regained my sense of humour, which "heals and keeps us whole" (REACH).[15] A healthy environment was indicated by the fact that so many students felt able to grow, integrating the professional and personal aspects of their lives.

Why is this work significant? The study engaged with many of the legitimate concerns relating to using Reflective Journals (Boud & Walker 1998). This work was an imperfect response to what most would see as a "difficult" task, but despite this, it provided enough support to make a difference to many students' lives, in ways recommended by progressive rhetoric as essential for sustainable futures. Since it took place in a "real" classroom, with little support or encouragement, it offers a glimpse of what might be achieved by teachers working in ideal circumstances.

> *"Humanity must learn to love the idea of leaving future generations a living planet"* (Meadows et al 2005: 283).

Acknowledgements

Correspondence

Patricia Kelly
Sessional Lecturer: Queensland University of Technology (QUT)
PhD candidate: Queensland University of Technology
Email: p.kelly@qut.edu.au   or
p2.kelly@student.qut.edu.au

Notes

1. Towards Globo sapiens: Using Reflective Journals to help prepare engineering students able to engage with sustainable futures.
2. All quotes are from journals which I have received permission to use in my research.
3. George noted a similar category (2002).
4. For a metaview of attitudes to change in relation futures thinking. (Inayatullah 2004)
5. Ethics, Appropriate Technology, Intercultural skills, Cultural sensitivities and International Responsibilities, Globalisation.
6. "Please note: We acknowledge the diversity of the group in terms of age, gender, work experience and cultural backgrounds. We

encourage you to include this as part of your journal responses wherever you feel it is appropriate" (BNB007 unit outline).

7. In late July, 2005, I read the first journal for 2005, from a young male (Accepter), who remarked (as had so many before him) on how interactive activities had made him aware of the need for respect and how once you got past initial differences, most people were easy to get on with.

8. I have not changed student writing in any examples. *By ESB and NESB, I refer to English speaking and Non English Speaking Background students.

9. I assured students in the lecture that no marker would criticise their writing in a negative or disrespectful way.

10. I have adapted Finnish futurist Pentti Malaska's term, originally Globo persona sapiens, which he intended as a descriptor of a future hybrid cyborg, silorg or symborg. I limit my adaptation to the human branch only.

11. Even the US College of Engineering has stated that "We need to move from seeing the Earth as an 'endless, limitless frontier' to seeing it as a spaceship, with limited resources that have to be closely monitored and managed to preserve the health and welfare of the crew"

12. The rather unusual names on some examples are the interviewees' self chosen pen-names.

13. The pseudonym of a colleague interviewed for the study.

14. Lady Arwen is 18, and Bo is a mature-age graduate, both female.

15. Respecting Ethnic and Cultural Heritage organisation, Seattle, USA.

References

Badley, G. 2000. Developing Globally-Competent University Teachers. *Innovations in Education and Training International (IETI)*. 37(3): 244-253.

Barnett, R. 1997. *Higher Education: a critical business*. Buckingham: SRHE and Open University Press.

Bolton, G. 1999. Reflections through the looking-glass: The story of a Course of Writing as a Reflexive Practitioner. *Teaching in Higher Education*. 4(2): 193-.

Boud, D. 1998. Reflective practice and the scholarship of teaching:
Looking beyond good intentions. *Studies in Higher Education*. 23(2): 191-206.

Boud, D., & Walker, D. 1998. Promoting Reflection in Professional Courses: the Challenge of Context. *Studies in Higher Education*. 23(2): 191-206.

Bowers, C. A. 1995. *Educating for an ecologically sustainable culture: rethinking moral education, creativity, intelligence, and other modern orthodoxies*. Albany, N.Y: State University of New York Press.

Bowers, C. A., & Flinders, D. J. 1991. *Culturally responsive teaching and supervision: A handbook for staff development*. New York: Teachers College Press.

Brady, V. 2004. "It's the context', Stupid: The First Necessity." Paper presented at The First Necessity: Access to Learning in the 21st Century Conference, 14-15 October. National Library of Australia.

Brennan, A. 2005. "Globalization and the environment: endgame or a 'new Renaissance'?" In J. Paavola & I. Lowe eds., *Environmental Values in a Globalizing World*. Pp. 17-38. Abingdon, Oxford, UK: Routledge.

Brice, J. 2004. The Virus Analogy. *Journal of Futures Studies*. 9(2): 77-82.

Dator, J. in Paavola, J., & Lowe, I. (eds.). 2004. *Environmental values in a globalising world: nature, justice and governance*. London: Routledge.

Dervin, B., Foreman-Wernet, L., & Lauterbach, E. 2003. "Sense-Making's journey from metatheory to methodology to method: An example using information seeking and use as research focus." In *Sense-Making Methodology Reader: Selected Writings of Brenda Dervin*. Cresskill, NJ: Hampton Press.

Diamond, J. 2005. *Collapse: How Societies Choose to Fail or Survive*. Victoria, Australia: Penguin Group.

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

George, S. 2001. *Learning and the Reflective Journal in Computer Science*. Paper presented at the Twenty-Fifth Australasian Computer Science Conference (ACSC 2002), Melbourne, Australia.

Hood, D. 2005, June. "Accreditation, The Key to Integrating Sustainability into U/G Courses." *SEEK*. 2(1): 1-2.

Inayatullah, S. 2002. *Questioning the future: futures studies, action learning and organizational transformation*. Tamsui, Taipei: Tamkang University.

_____ 2004. "Future avoiders, migrants and natives." *Journal of Futures Studies*. 9(2): 83-86.

Kenny, V. C. 2004. "Educating the Imagination of Change." Paper presented at The First Necessity: Access to Learning in the 21st Century Conference, 14-15 October, National Library of Australia.

Kunstler, J. H. 2005. "As oil ceases to be cheap and reserves start to deplete, we will be left with an enormous surplus population that the earth will not support." Retrieved accessed 28/9/05, 2005, from http://newstatesman.com/Economy/2005 08010016 From *The Long Emergency: surviving the converging catastrophes of the 21st century*, 2005, Atlantic Books

Mayer, M. 2003. "Living at the border: between multiculturality, complexity and action research." *Educational Action Research*. 11(2): 213-232.

Markly, O. W. 2002. "Visionary Futures: Guided Cognitive Imagery in Teaching and Learning about the Future." In J. Dator (ed.), *Advancing Futures: Future Studies in Higher Education*. Pp. 330-341. Westport. Conn: Praeger.

Malaska, P. 1997. "Inventing Futures." Paper presented at the World Futures Studies Federation XV World Conference 'Global Conversations -What You and I Can Do for Future Generations', Brisbane, Australia 28 September - 3 October 1997.

Meadows, D., Randers, J., & Meadows, D. 2005. *Limits to Growth: the 30-year update*. London, Sterling, Va: Earthscan.

Mezirow, J. 2000. *Learning as Transformation: Critical Perspectives on a Theory in Progress*: Jossey-Bass.

Palmer, S. 2000. "Student responses to activities designed to develop generic professional skills." *Journal of Professional Issues in Engineering Education and Practice*. 126(4): 180-185

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.

Rogers, M. 1996. "Facing the future is not for wimps." *Futures*. 28(5): 491-496.

Seaton, A. 2004. "Resolving dichotomies of power and identity in pedagogical theory and practice. A way forward for democracy." Paper presented at the Australian and New Zealand Comparative and international Education Society's Conference. Retrieved 10 June, 2005.

Sterling, S. 2001. *Sustainable Education: Revisioning Learning and Change*. Totnes, UK: Green Books.

Singh, M. 2002. "Rewriting the ways of globalising education." *Race Ethnicity and Education*. 5(2): 217-230.

Taylor, E. W. 2000. Analyzing Research on Transformative Learning Theory, Chapter 11. In J. Mezirow (ed.), *Learning as Transformation: Critical Perspectives on a Theory in Progress*. San Francisco, CA: Jossey-Bass.

Taylor, R. 2005. "Changing Behaviour? New Zealand Households Learn to Tackle Practical Sustainability (A Working Paper)." Paper presented at the EIANZ Conference, Christchurch, 30 March 2005.

Thomas, S. 2004. "Words are failing our graduates." *The Australian*. July: 40.