Critical Auto/ethnographic Research as/for

Transformative Professional Development

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Introduction

In this paper I address the question of how educational research can be made relevant to the cultural contexts of international postgraduate students (e.g., from Southern Africa) who are studying full-time in overseas universities (e.g., in Australia). I draw on 15 years experience mentoring postgraduate research in science/mathematics education, including six students from Southern Africa (two of whom have submitted papers for this conference based on doctoral research). A major challenge facing postgraduate research mentors is to provide appropriate methodologies for intercultural research which address the question of how to design culturally inclusive science/mathematics education systems for preparing young people in societies undergoing rapid cultural transition to enter the modern world and, at the same time, respect, celebrate and grow their own local cultural capital. Drawing on developments in contemporary qualitative research, especially arts-based inquiry and critical auto/ethnography, I shall argue that postgraduate researchers can profitably harness their own life-world experiences as a primary source of narrative data in order to examine critically key philosophical and political assumptions underpinning science/mathematics education policies and practices that govern teaching, curricular and research practices in their own countries.

Culturally Diverse Students

At Curtin's Science and Mathematics Education Centre our postgraduate programs are designed to provide professional development for teachers and teacher educators of science and mathematics. Our overseas students are highly skilled, multilingual professional educators who come from a range of (in their own words) "developing countries"[1]: Southern Africa (Lesotho, Botswana, Namibia, Mozambique, Malawi), Southern Asia (Nepal, Bhutan, China, Thailand, Pakistan, Indonesia) and the South Pacific (Solomon Islands, Vanuatu, Tonga, Fiji, Papua New Guinea). Thus they vary considerably in their cultural backgrounds and worldviews. Some have grown up in traditional village lifestyles, some in urban environments. Some are from largely non-Western (Buddhist, Islamic) cultures, some from multi-ethnic populations. Many are from

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[1] The concept of 'developing country' is problematic for me because it incorrectly implies that 'First World' nations have reached a zenith of development and should thus be regarded as exemplary in all domains of human life, including not only science, technology, industry and free market economics but also culture, language and spirituality.

nations that have recently gained political independence from former colonial regimes of Britain, Portugal, Germany, France, Australia, South Africa, etc.

As experienced professional educators working in schools, colleges and universities, they have made fascinating *cultural border crossings* (Giroux, 1993) into a Western modern worldview, especially those born into village life. However, it soon becomes clear that few have given much consideration to the problematic nature of their unwitting roles as agents of enculturation of their own students into the rapidly globalising Western modern worldview. The questions they initially seek answers to from educational research are important, but are largely of a practical 'how to' nature:

- How can student participation and achievement in science and mathematics education be improved?
- What innovative teaching and learning approaches can help?

Such a well intentioned but narrowly conceived reformist perspective fails to question critically the relevance to the development of their own societies of the curriculum and assessment policies which govern their professional practices. In other words they seek only to reform rather than transform their professional practices.

Education for Cultural Diversity

Although science and mathematics education are a 'good thing' because they have the potential to contribute to improving our quality of life, unless they are handled with great care they also can be harmful to cultural health, especially in societies undergoing rapid cultural transition under the influence of Western modernisation (e.g., Luitel & Taylor, 2006). Deeply embedded in science and mathematics curricula exported historically to every corner of the planet (especially by Australasia, Europe, the USA) is a powerful Western modern worldview rooted in the European Enlightenment (for greater detail see Taylor, 2005). Although this worldview offers a host of material benefits (e.g., medicine, transport, communication, agriculture) its 'side effects' are destabilising the future of humankind via threats of global warming, nuclear/biological warfare, air/water pollution and species extinction, to

> **Cultural Identity**
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> I am interested in the politics of cultural identity formation (Banks, 2001; Golmohamad, 2004) and the role of science education in manufacturing young people's cultural identities, an issue of paramount significance in a postcolonial world in which the West's historical tendency to define social reality for others is being contested politically whilst being acceded to, in part, through the powerful vector of the international science curriculum export industry.
>
> (Taylor, 2005)

name a few. And so I argue that traditional science and mathematics curricula imported from the West and implemented without cultural adaptation continue to serve as a highly effective Trojan horse, carrying hidden within them the seeds of a culturally transcendent scientism[2] which

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[2] Scientism is an ideological view that science is a privileged knowledge system, superior to alternative ways of knowing the physical (and, many argue, the social) world. In universities it has been asserted to the highest degree as the 'gold' standard for higher degrees, especially postgraduate educational research methodology.

privileges an un-self-critical Western scientific way of knowing over non-Western knowledge systems, sometimes called *traditional ecological knowledge*.

In classrooms in which scientism flourishes teachers focus on transmitting a transcendent body of scientific and mathematical knowledge rather than on educating culturally situated children. Their pedagogical actions are governed by a positivist epistemology and technical rationality in which canonical knowledge is portrayed as irrefutable and universal rather than as unfolding, contingent and limited in scope. This image of science and mathematics is supported by the well-established teacher-centred image of the curriculum as *a container of foreign subject matter* the content of which is to be delivered to compliant students, rather than a means of enabling students to make sense of their culturally situated experiential realities. Canonical knowledge is thus reduced and commodified for delivery to uncritical consumers; and narrowly conceived systems of assessment help to cement in place this anti-democratic and culturally homogenising process.

New Science & Diversity

These old views of science have contributed to environmental exploitation and have marginalised many people. As many scientists now recognise, young people need to learn to value global cultural diversity, to value diverse ways of knowing the world, and to respect community-based approaches to social change as part of education for sustainability.   (Fien, 2001, p. 19)

Culture studies researchers in science and mathematics education have been arguing for over a decade that a scientistic image negates the multicultural and multilingual nature of authentic learning and, by denying the legitimacy and usefulness of local knowledge systems and cultural contexts, endangers cultural diversity worldwide (e.g., Aikenhead & Jegede, 1999; McKinley, 2005).

During the closing decades of the twentieth century in nations such as Australia, the iron grip of scientism on school science and mathematics began to weaken in response to a demand for humanistic pedagogies that are more sensitive to the learner and his/her learning process. Today's contemporary classroom environments are being fashioned by skilful use of (i) *constructivist theory*, which emphasises the pedagogical importance of focussing on the learner's cognitive and social meaning-making processes, and (ii) *critical social theory*, which promotes a democratic ethos and focuses pedagogical attention on social justice issues such as gender inclusiveness and socially responsible science (Kincheloe, 2004; Taylor, 1998). However, given the residual hegemonic strength of the Western modern worldview, contemporary science and mathematics classrooms in much of Australia show little evidence of non-Western worldviews being taken into account; indeed cultural homogeneity continues to rule, except for a small number of Aboriginal schools in remote parts of Australia.

Transformative Professional Development

In the past ten years, teacher education programs in Australian universities have been preparing science and mathematics teachers skilled in 'student-centred' teaching approaches. One of the growing influences on teacher preparation is transformative learning theory which emphasises, amongst other things, the importance of developing critically reflective teachers (Brookfield, 1995). As a teacher educator I strive to empower my postgraduate students with a transformative

perspective with which to question critically and personally their own standing in the world as professional educators. Typical transformative questions include:

- What are the key social, cultural and political challenges facing my rapidly changing society?
- Whose cultural interests are not being well served by traditional educational policy and practice?
- Who are these students whom I greet every day? What are their worldviews, languages and life-long learning needs?
- Who is the cultural self who teaches? What key life-world experiences and values underpin my own professional practice and aspirations?
- What is my vision of a better world and how can my own professional practice help to realise it?

Transformative learning is an holistic experience which involves much more than consuming bodies of disciplinary knowledge. My vision is for transformative professional development to afford rich opportunities for students to undergo a *butterfly-like* metamorphosis towards the 'getting of wisdom' by investing in the growth of their own cultural capital and becoming producers of culturally situated curricula (Henderson & Kesson, 2004; Palmer, 1993). Such a transformation in personal agency involves developing diverse ways of thinking and new modes of consciousness - *critical reflective thinking, metaphoric reasoning, dialectical thinking, metacognition, spiritual awareness, poetic thinking, integral thinking, envisioning*.

> **Transformative Learning**
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> Transformative learning involves experiencing a deep, structural shift in the basic premises of thought, feelings, and actions. It is a shift of consciousness that dramatically and permanently alters our way of being in the word. Such a shift involves our understanding of ourselves and our self-locations, our relationships with other humans and with the natural world; our understanding of relations of power in interlocking structures of class, race, and gender; our body-awareness; our visions of alternative approaches to living; our sense of possibilities for social justice and peace and personal joy.
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> (O'Sullivan, Morrell, & O'Connor; 2002, p. xvii)

However, despite progress towards transformative learning in teacher education, one of the last remaining obstacles to be overcome is postgraduate research, especially for science and mathematics educators many of whom remain imbued with a naive Western modern worldview. In my experience, the main barrier to engaging mathematics and science educators as novice transformative researchers is their deeply embedded assumption that positivism is the privileged epistemology of research for the social sciences which, in its extreme form, honours the following principles.

- Valid knowledge can be produced only by means of objective, value-neutral inquiry.
- Research is a theory-testing deductive process of manipulating variables that have been pre-defined by expert others.
- Bridging the 'theory-practice gap' in education involves privileging the theoretical voices of expert academic researchers.

- Research report writing involves writing 'voicelessly' (3rd person, past tense, passive voice) in a preordained, one-size-fits-all template with a linear structure - Introduction, Literature Review, Methodology, Results, Conclusions, Recommendations.

Clearly there is not much space in this model for showing evidence of the transformative growth of the novice educational researcher! Nevertheless, my intention is not to deconstruct positivist research (in fact I continue to practice a small amount of it - see Yeo, Taylor & Kulski, 2006) but to loosen its hegemonic grip on professional educators' worldviews. My transformative goal is to open the minds and hearts of science and mathematics educators to alternative epistemologies of inquiry. And to this end I promote critical auto/ethnography which involves transformative learning and draws on arts-based research.

Critical Auto/ethnography

The field of contemporary qualitative research comprises many promising methodologies for engaging in transformative professional development (e.g., Denzin & Lincoln, 2005; Green, Camilli, Elmore, & Grace, 2006). Of special interest to my research program is critical auto/ethnography which is situated at the nexus of *ethnography, writing as inquiry, arts-based research, narrative inquiry, evocative autoethnography, anthropological poetics, philosophical inquiry, critical hermeneutics* and *practitioner inquiry*. For science and mathematics educators undertaking postgraduate professional development, especially in the context of cultural studies, this transformative approach provides a methodology for inquiring critically, reflexively and artfully into the relationship between the researcher's own cultural identit[y/ies] and his/her lived experience as a consumer (i.e., student) and (re)producer (i.e., teacher, teacher educator) of education.

Critical auto/ethnography involves writing not simply as a process of reporting on a completed inquiry but, more importantly, as a process that is constitutive of the act and art of inquiry: the researcher inquires as s/he writes (Richardson, 2000). The autobiographical aspect fosters excavation of deeply sedimented cultural memories thereby enabling the researcher to identify and examine his/her personal experience of historically established educational policies and practices (Taylor & Settelmaier, 2003). Through authoring and reflecting in critical and scholarly ways on their personal-cultural

> **Auto/Ethnography**
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> I use the slash…because …the individual and its society - which is the seat of the social and the cultural - mutually presuppose one another. They stand in a dialectical relationship. (Roth, 2005, p. 3)

narratives researchers can recover and reinvest in their cultural capital, an important step in the process of personal and professional transformation. To develop one's authority as a producer (rather than reproducer) of cultural knowledge is a step towards decolonizing both one's research and one's professional practice (Mutua & Swadener, 2004).

When applied reflexively to the academic culture of research, critical auto/ethnography involves decolonising the researcher's practice of inquiry by identifying, contesting and reconceptualising residual scientistic research requirements, especially conventional validity criteria and thesis/dissertation structures. Critical reflexivity enables the researcher to keep alive the spirit of critical interpretive (or hermeneutic) inquiry characterised by the *emergence* of unanticipated

research questions, new methods of inquiry and thematically structured report writing (Stapleton & Taylor, 2003).

In making sense of the research status of the personal-cultural knowledge outcomes of critical auto/ethnographic research it is important to understand the *post-epistemological* perspective of this approach (Taylor & Wallace, in press). In the postmodern research era conventional standards of validity, reliability and objectivity have been reconceptualised in a variety of ways, amongst which are arts-based standards of *narrative truth* such as verisimilitude, dialogical voice and critical reflexivity (Barone & Eisner, 2006; Clough, 2002; Ellis & Bochner, 2000; Van Maanen, 1988). For science and mathematics education quality standards for a critical auto/ethnographic inquiry can be drawn creatively from the following familiar fields of research:

> **Evocative Autoethnography**
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> My open text consciously permitted readers to move back and forth between being in my story ad being in theirs, where they could fill in or compare their experiences and provide their own sensitivities about what was going on…to feel that in describing my experience I had penetrated their heads and hearts...I hoped they would grapple with the ways they were different from and similar to me
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> (Ellis, 1997, p. 131)

- An *ethnographic* approach to generating rich understanding of a cultural group's worldview perspectives and practices and adaptive responses to the challenges of modernisation.

- An *autobiographical* focus on exploring one's own lived experience as a member of a cultural group and of adapting to challenges of moving across cultural borders into other discourse communities.

- An *emancipatory* interest in identifying and deconstructing the distorting influence of powerful systems of thought and action that have colonised historically a cultural group and continue to maintain a powerful presence by virtue of their hegemonic invisibility and uncontested political value.

- A *postmodern* perspective on artful inquiry which uses literary genres to evoke multiple modes of thinking and feeling with which to communicate complexity, ambiguity and paradox to one's reader in educationally thoughtful ways.

During the past few years critical auto/ethnographic research has become established in science and mathematics education as a preferred methodology for enabling culture studies researchers to undertake transformative professional development (Pereira, Settelmaier & Taylor, 2005). This involves researchers examining critically their culturally situated lived experiences as students, teachers and teacher educators, reconceptualising their cultural identities, and developing educational philosophies for rendering science and mathematics teaching inclusive of the everyday worldview practices - *beliefs, knowledge, values, languages, identities, games, relationships, experiential realities, taboos, dreamings* - that children all over our planet bring into the classroom from their infinitely varied out-of-school lives (Afonso, 2007; Cupane, 2007; Luitel, in press).

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