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16. EDUCATING CRITICAL MATHEMATICS EDUCATORS: CHALLENGES FOR TEACHER EDUCATORS

Ole Skovsmose's work, particularly *Towards a Philosophy of Critical Mathematics Education*, presents challenges for me as an adult numeracy teacher educator. I work in the field of adult education at a university in Australia. Increasingly the field — including adult numeracy— has been facing a narrowing from a broad socially and personally beneficial education and training agenda to one that focuses only on human capital outcomes (Shore & Searle, 2008; McHugh, 2007). There is now less valuing of the kinds of education that are linked to increasing identity capital and social capital (Schuller, 2004). In such a climate the prospect of adult numeracy teachers teaching critical mathematics is slim, if we understand critical mathematics education to entail critical insights about and action upon the structural impediments to social justice. What 'counts' in adult education has shifted, and this in turn is redefining what it means to be a teacher of adults. As a teacher educator, I have had to reflect on what kind of education I need to be offering those who are entering the field of adult numeracy teaching: what does it mean to be a critical mathematics or critical numeracy[1] educator in these times?

When contemplating this question, there are at least three possible areas to examine: the mathematics that the teacher will teach (critical mathematics); the teacher's pedagogy (critical mathematics pedagogy); or the teacher educator's pedagogy (critical mathematics or numeracy teacher education pedagogy). In this paper, I will focus mainly on the second and the third; however, I will argue that all three are intimately linked in creating spaces and places where critical mathematics can be a focus of learning. However, to create these spaces and places a key area that adult numeracy teachers and adult numeracy teacher educators need to, and moreover are well placed to engage with, is educational policy because, as I will argue in this chapter, it is precisely the predisposition to quantitative thinking by bureaucrats and politicians that has contributed significantly to the marginalization of the broader aims of learning in adulthood.

The next section relates Skovsmose's framework for thinking about critical education to the current state of adult numeracy education in Australia. The third section examines the focus of critique (education policy) in the context of the current working environment of Australian adult numeracy teachers. The fourth section considers how mathematics can be a resource for critique, the fifth section discusses avenues for teachers to engage in the politics of the crisis they are facing, and the section that follows examines the idea of teachers as activist for change in

order to act upon their critical analysis. Finally, the conclusion considers the role of the teacher educator in supporting critical mathematics teachers to reclaim their professional agenda so that they can pursue what they believe to be their role in the creation of a more just society.

SKOVSMOSE'S FRAMEWORK AND THE AUSTRALIAN CONTEXT

In *Towards a Philosophy of Critical Mathematics Education,* Ole Skovsmose (1994) says, "If educational practice and research are to be critical, they must address conflicts and crises in society" (p. 24). What conflicts and crises in society must a teacher educator of adult numeracy teachers address in her practice? In what critical situations in society must teacher educators expose and engage pre-service teachers? I will reflect on what critical educational practice might be for teacher educators in the contemporary adult education context in Australia by drawing on Skovsmose's discussion of the interaction between *crisis, critique* and *emancipation.*

My work involves educating adult educators. Some of my student teachers are already teaching, but have no university teaching qualification. Others are making a career change into adult education. The aim of the program is to educate reflective practitioners who have a strong theoretical foundation in adult education and knowledge of their field of practice and who with these foundations and knowledge, will critically reflect on their own practice and make informed contributions to progressive changes in their field.

Skovsmose (1994) challenges the idea that the goal of critical education is emancipation. He argues, however, that we cannot assume that there is some pre-destined state of emancipation that can be achieved through some suitable 'critical' activity. For Skovsmose, the crises and conflicts in society are complex and interdependent, and the resolution of one crisis can provoke a new crisis that traps or limits the same or another group of people in a different way. He says that a solution to a critical situation can only be considered as a transformation of the current state of crisis to a new state of potential future crisis, whose risks may not be able to be comprehended ahead of time. What does Skovsmose mean by crisis? For him crisis is not just a theoretical construct; crisis is located in reality, and he includes "suppression, conflict, contradiction, misery, inequality, ecological devastation and exploitation", both actual and potential (p. 14). He sees crisis as "a metaphor for a situation to which to react through the medium of critique", a process of identifying, interpreting, evaluating, and acting upon a critical situation (p. 16).

Crisis

What crises are facing the field of Australian adult numeracy educators? What would come to their minds? Perhaps for some, they are global crises such as global warming, the global financial crisis, and the continuing violent conflicts and poverty in different parts of the world. Others may think of national crises such as the continued educational, social and economic disadvantage faced by many

Indigenous Australians, the state of public hospitals that are increasingly incapable of coping with the growing demand or the shortage of skilled workers in the trades, nursing and teaching profession. Still others may think of crises in their own field of adult literacy and numeracy, such as the recent national survey that shows that over fifty percent of Australian adults do not have numeracy skills at what is considered a minimum functional level (Australian Bureau of Statistics, 2006a), that non-accredited second chance education programs are under threat, or that their field is under threat of deprofessionalisation. We could think about a critical response to each of these crises, and imagine how a solution to any of these crises could lead to 'emancipation' of a small or very large group of people.

At the risk of being parochial, I want to focus here on some of the crises Australian adult numeracy teachers face in their own field. As I write this chapter, the Federal government funding for the peak professional organization for adult literacy and numeracy has been stripped back through a 'repackaging' of funding in the adult education sector (Commonwealth of Australia, 2008). This peak body has provided a number of key services such as providing a 'hotline' that people wanting to find out about literacy and numeracy provision and support could ring up and get advice. This peak body has also provided policy advocacy for the field, and kept the practitioners in the field informed of policy changes. It has held an annual conference to bring practitioners and researchers together so ideas and innovations in the field could be shared. Can this funding cut be called a crisis?

Adult literacy and numeracy programs for the disadvantaged groups of second chance learners, people with learning disabilities, socially disengaged youths, and women who are re-engaging with formal learning with a view to widening their community engagement have traditionally been provided by publicly funded further education colleges and community colleges. Over the last two decades, the base funding to these institutions has declined and become contingent on a large array of externally imposed accountability arrangements. Programs that used to be run because it served an apparent learner demand were cut or reduced if they did not attract funding either through student fees or external funding. As a result, many teaching positions have been lost or at best, filled by casually employed teachers. Can this be called a crisis, resulting also from a funding cut?

One of the traditions of adult basic education in Australia has been the design of programs based on the learner's own needs and goals, rather than on externally imposed standard curricula. The early 1990's saw a policy shift to adopting a competency based training and assessment system in Australia across all industries. This has also been adopted in the adult literacy and numeracy field with comprehensive 'tools' being developed to enable practitioners to design curricula against competency outcomes, and to assess learners against nationally recognised levels of competencies. Could this shift in pedagogy also be called a crisis?

Adult literacy and numeracy teachers in Australia have had professional status in Australia since the early 1990's when further education colleges started to require the teachers to have a university level teaching qualification. Hence teachers undertook an undergraduate adult education degree with a literacy and numeracy specialisation or in the case of those already holding a degree, a graduate

diploma in literacy and numeracy teaching. However, since then pre-university qualifications in training and assessment have been nationally accredited and it is no longer a requirement in further education colleges that teachers have a university teaching qualification. Could this deprofessionalisation of the field be called a crisis?

How do we recognise a problem as a 'crisis'? What is being suppressed; who is being exploited or devastated; what is in conflict; what inequalities are being constructed through the situations arising in each of these issues? We could look at each of these conflict situations separately and try to understand each in isolation of the others, or look for over-arching forces that might be the sources of these conflicts. If a critique of these crises is to enable more than a temporary reprieve from the superficial expressions of the crises, then we need to dig more deeply and widely.

Critique

What should be the starting point of a critique in the complex milieu that is shaping the work of adult numeracy teachers? There is much rhetoric in large organizations and institutions now that the one thing constant in contemporary workplaces is continual change. Somehow, not going with the flow of change is seen to be anti-progressive, even when there has been no apparent questioning of the real purpose and consequences of the change. However, one could ask what the nature of 'progress' is if changes simply lead to more changes. Could we not ask if change should have some more tangible purpose, perhaps even a benefit; should there not be some element of ethical consideration in making a decision to introduce change?

Uncritically accepting the idea that change is inevitable avoids the need to stop and reflect on the ethics of the change. Beck and Young (2005) touch on this problem in their discussion of the 'assault on the professions' through changes in the epistemological basis and identities of professions as a result of marketisation and managerialism (p. 183). They see a phenomenon reaching far beyond the teaching profession where "the dangers of situations in which independent professional judgment becomes co-opted, intimidated or silenced by aggressive and triumphalist shareholder capitalism and unscrupulous senior management" (p. 195). Their analysis is based on the work of Basil Bernstein (2000 cited by Beck & Young, 2005) that examines the challenges to the inwardness, inner dedication and a sense of vocation that characterise the identities of professionals and that gives authority to the autonomy and judgement exercised by one that belongs to the profession. Beck and Young observe that instead of the internally developed understanding of appropriate, ethical practice within any profession, there has been an emergence of externally imposed standards that are then regulated and audited by outsiders who do not share the insiders' professional identities.

A critique of any crisis affecting adult numeracy teachers must then examine the contexts of the adult numeracy teachers' practice beyond their immediate classrooms or institutions if the purpose is to uncover why there appears to be so many crises

affecting them. Kemmis (2000) suggests that there are different traditions that can be followed in the study of practice (including teaching practice), however, by locating teaching practices in the wider historical and socio-political milieu, practitioners and researchers can begin not only to see different aspects of the practice, but also see gaps such as those accounts of practice that are not being told, why one account appears to be more strongly valued than others and so forth. In his later work (Kemmis, 2005), he calls for practitioners not simply to rely on what they know and do here and now in their examination of teaching practice, but to ""search for saliences": that is, search for knowledge in and through practice to correct and amend practice in the light of changing circumstances and new perspectives [and] develop a "knowing practice": a form of practice that is alert to the ways knowledge and theory develop in and through practice" (p. 421). In this way, he is encouraging teachers neither to uncritically accept change, nor to stay uncritically resistant to change and stay stuck in the past.

Groundwater-Smith and Mockler (2009) also analyse the ways in which teachers' practices are constrained by the current culture of an 'audit society' that seeks to reduce teachers' professional practice to compliance with externally imposed, bureaucratic standards. Like Kemmis (2005), they advocate for teachers' engagement in critical, inquiry-based reflection on their practice as a way of (re)claiming a professional identity and exercising agency.

An important avenue for such a critical inquiry is an examination of the policies around adult numeracy and how they have changed in recent years —including how policies might have been diluted into non-existence. Moreover, what is needed is an uncovering of the ideological basis of the policies and the imperatives to make policy shifts. Welch (2007) argues the importance of teachers to be engaged with policy, and in tracing the educational policy development in Australia, demonstrates the increasing influence of neo-liberal ideologies in educational policies: increased privatisation, competition, casualisation of the teaching workforce, and commodification of education. Although, in 2007 the country managed to vote out the conservative government of some 11 years, the ravages of neo-liberal policies that flourished during that time, and arguably started to emerge even before this period, are unlikely to be reversed easily or in the immediate future. In such a climate, what does it mean to critique? Some might argue that the neo-liberal influence is so thoroughly pervasive that critique would only be an academic exercise that could not even begin to lead to change. On the other hand, for educators to take such a view would bring into question the whole project of education and the fundamental beliefs and values that underpin the practices of educators, particularly those who claim to be motivated by the pursuit of expanding social justice.

Emancipation

Skovsmose (1994) shows some caution in viewing emancipation as a goal or resolution of critique because firstly there is never any guarantee that there is a neat resolution, let alone an 'emancipatory' resolution to all crises and secondly,

emancipation for one group involved in the conflict may lead to other groups facing a different state of crisis or conflict. However, Skovsmose in no way argues that emancipation —however aspirational it may seem in a global and immediate sense— should not be pursued.

In the education of adult numeracy teachers, what could be emancipatory at this time and place? Looking at Kemmis's (2000) five aspects of studying practice is helpful here; he suggests that there are the following ways of thinking about practice:

1. Objectively defined set of performances of individual teachers

2. Objectively defined set of conditions and patterns of behaviour/ interactions of teachers as a group

3. Subjective set of standards, meanings and values as defined by individual teachers

4. Subjective sets of values, principles and goals for teaching/ education as defined by practitioners who identify with each other as a collective

5. Reflexive and changeable, historically, socially and politically contingent conditions.

We could understand the idea of emancipation using the way Kemmis (2000) identifies the dialectics between the individual and the social/subjective and the objective accounts of practice. For the individual teachers, emancipation might be the resolution of conflict between the official or externally defined standards and methods of teaching and their personal beliefs and standards about the practice of teaching. Similarly for teachers as a collective group, emancipation might be the freedom from policies that oppress and constrain the exercise of consensually agreed professional judgement and practices. Moreover, the idea that practices are changeable —and that a critical study of practices is part of shaping those changes— suggests that the possibilities of emancipation are linked to teachers having the agency to shape these changes.

THE FOCUS OF CRITIQUE: EDUCATION POLICY

Over the last decade and a half, Australian adult education policy has progressively narrowed in scope to address primarily labour market oriented goals, in a marketised environment. This policy shift transformed the official discourses in adult literacy and numeracy from that of social justice, second chance, learner-centred education to that of accreditation, standardised competencies, and upwards accountability (Kell, 2001). In the process, many teachers have felt disempowered, becoming 'tick-a-box' administrators who spend a large amount of their time at work on compliance exercises to secure funding for future programs rather than teachers who could exercise professional judgement and autonomy to negotiate the educational needs of their learners (Harris, Simons & Clayton, 2005; Mackay, Burgoyne, Warwick & Cipollone, 2006).

In tracing the changing influences on Australian educational policy over recent decades, Marginson (1997) shows how from the early 1990's onwards, vocational education in Australia has increasingly been defined as "the prototype of all post compulsory education" (p. 175). In concert with this change from a more broadly conceived idea of adult education provision to narrower forms of vocational training has been the growing privatisation of post-compulsory education through the downward trend in government funding for public providers of education and training, introduction of student fees on a growing range of courses even in the public educational institutions, and the establishment of many private training organizations. Welch (2007) argues that these changes, not only in post-compulsory education but in education generally in Australia, is due in large part to the "crisis of the state" (p. 7).

Welch draws on analyses by Pusey (1991 cited in Welch, 2007, p. 7) and Yeatman (1990 cited in Welch, 2007, p. 7) and explains that Australia has transformed itself from being a welfare state, where the state developed policies for the welfare of its citizens to being a competitive state where the policies advanced by the state serve to advance the economic competitiveness even when this conflicts with the welfare of its citizens. Welch adds that this form of "economic rationalism", a term used by Pusey (1991 cited in Welch, 2007, p. 8) that is based on a very individualistic, positivistic economics has replaced the notion of the social good in the mainstream discourse. Neo-liberalism as an ideology has come to dominate educational policy in Australia, as it has in many other parts of the world.

Australia would not be alone in seeing notions such as efficiency, competition, productivity, accountability, flexibility and choice increasingly dominating the way education is talked about and framed. A discourse of education framed by these notions has little room for discussion about educational programs that seek to redress social and economic disadvantage. Learners who participate in second chance education programs are those who need time to unlearn negative experiences of education, who had dropped out of the race, who are seeking a way of contributing more productively and widely in society, and who are needing to develop the knowledge and skills that will give them greater choices in life. The teachers who work with these learners need to demonstrate a high level of accountability and flexibility —to their learners and their different needs and aspirations, however, these are antithetical to the upward accountability and employer flexibility that is 'rational' in the contemporary adult education settings. The role of the state has changed from an enabling role to that of a controlling and auditing role that is felt at the coalface in terms of diminishing government funding and increased record keeping and reporting at the expense of teaching and learning time.

In such a climate teachers can feel powerless, certainly individually, but also collectively. In the study by Mackay, Burgoyne, Warwick & Cipollone (2006), teachers lament their professional development, where they are able to access it, being dominated by training about compliance rather than teaching and learning issues: "there were complaints that employers and managers were too preoccupied with compliance and technology-related workforce development. In addition, they were undervaluing the importance of teachers developing their teaching skills" (p. 7). What does it mean to critique this crisis? At the individual level, teachers can draw on their

theoretical foundations to analyse how their own philosophical and pedagogical positions compare with those that are implicitly or explicitly being advanced by the policies. Groups of teachers can do this collectively as well. However, what many teachers will, and indeed have found from such analyses is the disempowerment of teachers, which in turn begs the question of why engage in critique. What is the point?

The point of critique would arguably be questionable if it focussed on the minutiae of the different ways in which the policy environment is affecting teaching and learning practices. Within the over-arching discourse of neo-liberalism it is unlikely that critique about particular areas of impact —for example, casualisation of teachers in a college, reduced funding for a particular equity program, dominance of employability skills over other educational goals, the burden of reporting requirements could make any noticeable or sustained impact on the demise of second chance education. This is not to diminish the importance of noticing the impact on the local, day-to-day practices of teachers' work; however, if the problems stem from ideological foundation of the policies, then until this is tackled, the possibilities of emancipation will be elusive.

CRITICAL MATHEMATICS AS A RESOURCE FOR CRITIQUE OF EDUCATION POLICY

How is mathematics implicated with neo-liberal discourses? Skovsmose formulated the idea of the formatting power of mathematics in *Towards a Philosophy of Critical Mathematics Education.* Later on this idea was examined further (Skovsmose & Yasukawa, 2004) and was reformulated to express the idea that: (1) mathematics is a tool for imagining alternative futures that cannot be conceived without the analytical and constructive (modelling) capabilities that mathematics can afford; (2) mathematics enables hypothetical reasoning by enabling us to examine details of situations that have yet to be realized; and (3) when mathematics choices that have been made imaginable and realizable through the functions of mathematics are implemented, mathematics enters into the social world and becomes part of the fabric of social realities. Thus, exercising one's critical mathematical knowledge and skills would mean engaging with the idea that, by choosing numbers to describe aspects of teachers' work, the nature of that work is simultaneously being constructed 'mathematically'. Skovsmose has not argued that mathematical formatting only occurs to imagine, realise and operate within a neo-liberal world. The point is that mathematics can be appropriated to model and reify practices that factor in the model makers' ideologies; as such, strategies to critique these models must be part of the critical inquiry that is needed by teachers to 'search for saliences' in their professional practice.

Depending on what it is about teachers' practice that is being mathematised, and how it is being mathematised, a teacher's practice may be constructed in a way that is sympathetic to the teacher's own beliefs and philosophies or antagonistic to them. For example, what is counted might be the numbers of students enrolled, numbers of students whose literacy or numeracy level moves up by one or more levels during the course, numbers of students who find employment at the end of the course, number of teachers involved in the program, and the amount of funding

for the program. These might then be presented in terms of the success rate of students, the average time it takes for students to progress from one level to the next or the time it takes for them to secure a job, student to staff ratios, dollars per student. These figures might then be monitored and compared from year to year or from institution to institution. Once these figures are made, those who have access to the figures can use them as political tools. There will be stakeholders who will find them useful to evaluate a program or the provider of the program. A provider who manages to achieve high success rates with the least amount of dollars per student might be assessed as an economical provider. A provider whose learners achieve success in the shortest period of time, or with the largest student to staff ratio might be assessed as an efficient provider. Teachers themselves or their unions on the teachers' behalf might also use the same figures as tools for demonstrating declining resource levels per-student, workload increases for staff, and other instances of eroding conditions for teaching and learning.

One of the concerns expressed by adult literacy and numeracy teachers is that in one of the largest federally funded labour market programs, they are required to devote an extraordinary amount of time keeping records to be ac-count-able to their funding body, the Government; moreover, they are concerned that this time takes them away from the more important time that they should be spending in designing or adapting curricula to meet the real needs of the learners (Australian Council for Adult Literacy, 2008). This may be a crisis in itself for teachers whose work is being reshaped from that of teacher to administrator. However, a critical response to this situation must go beyond that of criticizing the onerous accounting requirements. The idea of the formatting power of mathematics suggests that the choice of mathematics to describe the world is intentional and is made to afford particular alternatives that may be more difficult to imagine or investigate without the mathematical model. Having made the choice to mathematise a situation or a problem, further choices are made about what aspects to mathematise and how. Making those choices influences how mathematics shapes and becomes part of a new social reality. In some cases, the resultant social reality is very different to the solution that some of the stakeholders might have imagined for the original problem, assuming there was some consensus about the original problem. The following diagram might represent the process that leads to this kind of disjuncture:

How does 'reality' get mathematised?
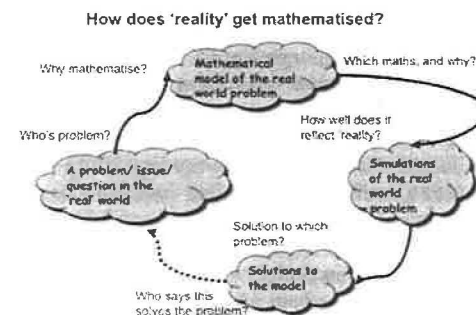
As the diagram shows, at each stage of the mathematical modelling process, there are critical questions to be asked. In a situation where aspects of teachers' work are being mathematised to construct new practices that do not sit comfortably with teachers' beliefs and philosophies any critical response must be informed by these questions and also how they are being answered by those who are driving the mathematisation, even if the answers are not made transparent to all concerned. For example, a Government which is struggling to balance the cost of public education at the same time that there is a crisis in health, housing and other public services and which is unwilling to take measures that might hurt their chances at the next election would look at costly provision as a problem. If in addition, the employer groups are complaining of skills shortages and workers not equipped with 'basic' literacy and numeracy, the Government would seek to find ways to deliver literate and numerate workers quickly while minimising the cost to tax payers. Implicit in the kinds of educational programmes that are valued as responses to the crisis framed in this way is an emphasis on developing human capital: developing a skilled and qualified workforce. It is difficult to argue that this is unimportant, and indeed teachers are not arguing that. However, many teachers are struggling to challenge the narrow focus of adult literacy and numeracy education on human capital building alone. But how can teachers go beyond analysing the problem to acting upon the problem to effect change?

WHAT AVENUES EXIST FOR CRITICAL MATHEMATICS TEACHERS TO ENGAGE IN THE POLITICS OF EDUCATION?

How can critical mathematics educators critique and act upon education policy? In a policy environment where ac-*count*-ability in terms of cost efficiency and productivity is valued, there is a role for teachers with mathematics/ numeracy expertise to critically analyse what is being 'counted' —the numbers that are being presented and used to make decisions. For example, in the Council of Australian Governments announced that as part of advancing and monitoring their productivity agenda, they would be examining:
- proportion of the working age population at literacy level 1, 2 and 3;
- proportion of 20–64 year olds who do not have a qualification at or above Certificate III;
- proportion of graduates employed after completing training, by previous employment status;
- percentage of graduates with improved employment status after training;
- the number of hard-to-fill vacancies; and
- the proportion of people employed at or above the level of their qualification, by field of study. (Council of Australian Governments, 2008)

Davis and Hersh (1986) write about applied mathematics having descriptive, predictive and prescriptive functions in the social world. Mathematics can provide a description of the world, albeit as I will argue later, a partial representation of reality. People can use this description to make predictions about what could happen if certain conditions were met, and based on those predictions, prescribe

certain actions or make interventions to ensure that what happens is what they think should happen. Numbers are powerful as tools in debates because as some of scholars of the history and philosophy of mathematics have noted, mathematics has a façade of objectivity, neutrality and 'distance' from the messiness and subjectivity that is the reality of the social world (Porter, 1995; Hacking, 1990; Gigerenzer, Swijtink, Porter, Daston, Beatty & Krüger, 1989).

An example of teachers engaging in policy debate is the current issue about funding to the public providers of vocational education and training (including second chance education). The teachers' union has presented figures and graphs to show a correlation between diminished funding to the public providers and consequent effects that has had on the workforce (increased casualisation), economic impact on students (increased fees), the viability of non-profitable courses, and student to staff ratios (Kronemann, 2009). In another example some practitioner groups, including the peak professional organization for Australian adult literacy and numeracy teachers have argued that Government evaluation of educational provision in some labour market programs has used narrow measures of language, literacy and numeracy outcomes in isolation from broader indicators that impact in an adult's capability to enter the workforce. They have suggested that other measures, such as the OECD Wellbeing indicators and measures of social capital be included in making an evaluation of the value of participation in these programs to the individual and their community (Australian Council for Adult Literacy, 2008). Thus mathematics can be a powerful tool for arguing a position about policy issues, and numeracy teachers can contribute their knowledge and skills in mathematics and statistics to put together a case that advances or challenges a policy position. They can produce descriptions —of educational outcomes, or of working conditions, or trends in funding levels. Based on these descriptions, they can make predictions and propose prescriptions that could mitigate negative effects or even promote positive effects.

The act of interpreting and using mathematics as a tool for argumentation is an important part of critique. At one level, this involves the critical examination of the numbers and the maths that have been presented and used. However, a deeper examination is needed. The situation in which many adult numeracy teachers who advocate for education as a right and as a critical vehicle for redressing social injustice are finding themselves is a situation of crisis between this philosophical belief about education, and the human capital theory of education that sees education as a means of generating productivity in economic terms (McHugh, 2007).

In challenging the narrow focus, and arguing for the broader agenda of identity and social capital as well as human capital building teacher groups also have to critically determine whether they will use mathematics as their tool for persuasion and advocacy or not. As mentioned earlier, the peak professional council for adult literacy and numeracy suggested that labour market programs could consider taking into account additional measures of wellbeing and social capital when funding bodies evaluate the value of literacy and numeracy programs. In developing this case, the Council could be proposing a different mathematisation of adult literacy and numeracy learning, that takes into account some measurable outcomes in learners' wellbeing and social inclusion and engagement. Studies in the UK

(Schuller, 2004) have shown that learning in adulthood does indeed contribute to the building not only of aspects of human capital such as employability skills, qualifications and knowledge, but also social capital and identity capital. Social capital includes attributes such as connection with family and community and civic participation, while identity capital includes attributes such as self-confidence and esteem, motivation and goal setting (Schuller, 2004). The development of identity capital is a key element of adult education, particular for those who take a humanistic position, that is, that a prime goal of adult education is to nurture the growth and support the self-actualisation of the learners as human beings (see for example Rogers, 1969). The development of social capital on the other hand is essential to the idea of critical education that sees learning as empowering people to take greater control of their lives by acting within and upon the world that they live in, challenging those structural barriers to equal participation and participating in community building (see for example, Brookfield, 2005). Both the humanistic and critical traditions have had strong influences on the practices and pedagogies of adult basic education in Australia, and their uneasy coexistence with the neo-liberal agenda is arguably at the heart of the current crisis.

Advocating for inclusion of identity and social capital outcomes through a different mathematisation of learners' and teachers' experiences may be one active engagement with the politics of education. In the latest international survey of Adult Literacy and Lifeskills (Australian Bureau of Statistics, 2006b), survey participants were tested on their health literacy levels. The Australian Bureau of Statistics (2006c) also has indicators of social capital based on "people's participation or non-participation in groups, activities or events which may generally be considered to be beneficial to the development of trust, cooperation and stronger community networks" (p. viii). Thus there are metrics that could be constructed to measure aspects of identity and social capital. However, developing or using these metrics must be undertaken with a critical understanding of the implications of introducing another set of metrics into the policy debate.

Firstly, in using metrics, rather that other ways of describing the broader benefits of learning that students might experience, the mathematisation of learners' and teachers' work in the field is given further credibility. It may be that there is no choice given that the ac-*count*-ability and audit culture is so strong so that it is even difficult to initiate a debate about the problems of normalising an audit culture in the teaching and learning environment. Furthermore, in making a decision to quantify the identity and social capital benefits of learning, teachers will need to be prepared to add these dimensions to their checklists and reporting load.

Secondly, once the metrics are developed and introduced, the measurements become available to all of the stakeholders. Hence it is important to select those metrics strategically. What meaningful measurements can be made of learners' wellbeing and social capital? What measurements can actually be made within the timeframe of the programs? There is a dilemma for teachers in this regard because funding for these programs is often for short durations, and many of the teachers are casual teachers who may not be employed for long enough to see the longer term benefits that the learners are gaining from their engagement with learning.

Thirdly, it is important to consider the barriers to the recognition of the significance of these metrics in the debate. If the dominant discourse is imbued with a neo-liberal, narrowly instrumental views of education, will simply having numbers that measure other benefits shift the discourse? Here, teachers need to engage in politics to draw attention to what the numbers are saying and meaning.

TEACHERS AS ACTIVISTS?

The works of Sachs (1997) and Groundwater-Smith and Sachs (2002) on activist professionals, and that of Reid, McCallum and Dobbins (1998) on teachers as political actors discuss how teachers can think about their roles and responsibilities when they are faced with a hostile policy environment. A key idea in their works is that teachers have to assume agency in the politics of education; they are activists and actors who can shape the policy environment in which they work. Thus professional teachers' engagement in critique, according to these authors, must involve action and politics, not just a theoretical or academic analysis of the policy environment in which they work.

At the heart of the concerns shared by all these authors is the attack on teachers as professionals. Indeed one of the aspects of the crisis in adult education in Australia is the devaluing of the status of adult educators in further education colleges from university qualified teachers to trainers with a pre-university certificate level qualification in training and assessment. This qualification is adequate for producing teachers "who can work in a way that is compliant with required policy, regulations and guidelines in an environment in which he or she feels comfortable, with support from others and in contextually routine circumstances" (Robertson, 2008, p. 18); however, this is not sufficient if teachers are themselves going to be able to act upon and shape those policies, regulations and guidelines.

In order to be effective as 'activist professionals' (Sachs 1997), Reid, McCallum and Dobbins (1998) explain that teachers need to develop skills and knowledge about the politics of education. Teachers need to be able to identify issues and critically analyse how the issues are being discussed by different players, they need to know who the players are, how to cultivate strategic alliances, and they need to be able to articulate their positions clearly and persuasively to all those who they need to influence.

Sachs (1997) illustrates how teachers in Australia were able to reclaim some of their professional agenda from the bureaucrats in the 1980's and 1990's when they worked through a national network of teachers, aided by other groups such as the unions and university academics. Sachs says that 'Reclaiming teacher professionalism is an ongoing struggle. It requires energy, commitment and the ability to think strategically' (1997, p. 273). Groundwater-Smith and Sachs (2002) add that it is also important to see 'trust as a social and professional resource' (p. 342) that has to be reinstated in times of uncertainty within the community in which teachers' work occurs. This presents challenges for the teacher educators: how do we educate activist professionals?

CONCLUSION: SO WHAT DOES IT MEAN TO BE A CRITICAL MATHEMATICS TEACHER EDUCATOR?

The struggles facing Australian adult numeracy teachers who see themselves as social justice activists are the kinds of struggles that can only be negotiated and won if teachers claim their professional right to engage in the politics of education. They must engage in a debate at both the macro and the micro levels, that is, challenging the neo-liberal assumptions about the role of adult learning and how that is implemented and interpreted in teachers' work. It is at the micro level that debates about what kinds of mathematics curriculum should be taught and learned — a narrow skills based maths or a critical maths curriculum— can take place. However, without tackling the debate at the macro level, any wins at the micro level will be difficult to sustain. Thus one of the roles that a critical mathematics teacher educator has is to ensure that they address teachers' political understanding and skills as part of their professional development.

In learning about politics and how to engage in policy debates, teacher educators will need to help their adult numeracy teachers learn about the different stakeholders in adult education and their policy stance —the industry skills council, different levels of governments, their employers, teachers' unions, professional organizations, adult educators in related fields, and groups in their learners' local communities. They will need to have skills in uncovering the ideological basis of the rhetoric espoused by those who are developing policies that undermine the professional standing of teachers. They need to learn about different ideologies and to be able to name them and to examine them critically and reflectively to gain insights into the 'crisis' that they as individuals or as a group of teachers find themselves in. A part of this exercise in 'discourse analysis' requires adult numeracy teachers to apply their knowledge of critical mathematics. This is not only about critically examining the technical 'correctness' of the figures that various parties to the policy debates present, or even the validity of the measurement and counting methods. Critical mathematics knowledge about the formatting power of mathematics and how this power can be appropriated by stakeholders to try to give credibility to their claims and shape the agenda of the debate must also be understood and applied in analysing the discourse that emerges in public debates about education. Thus not only do teacher educators need to include critical mathematics in the education of adult numeracy teachers as a way of challenging teachers' idea of mathematics as an objective body of knowledge, but also as a way of equipping teachers with an resource for analysing discourses surrounding their work as teachers.

Australian adult numeracy teachers have a big challenge in front of them. As educators of these teachers, teacher educators like myself must provide an education that not only has human capital outcomes in terms of technical skills and knowledge, qualifications and employability as compliant technicians, but also identity capital outcomes in terms of a confidence as a professional educator who can exercise judgement, and social capital outcomes in terms of engagement in public debates and building of networks and alliances of likeminded social justice activists and educators. Returning to Skovsmose's ideas of crisis, critique and emancipation as dimensions of critical education, a critical teacher education

program can be emancipatory for teachers if, through the development of these three kinds of capital, teachers gain the skills and knowledge, confidence and social networks to withstand and continue to critically analyse and actively challenge ideologies that seek to harm the advancement of social justice in the field in which they work.

NOTES

[1] The term *adult numeracy* is the commonly used term in Australia when we refer to the everyday mathematical practices of adults. The use of the term numeracy rather than mathematics signifies that numeracy involves mathematics but is *more than* mathematics because practices by definition is located and is contingent on the socio-cultural contexts in which the practices are located. See for example, Johnston and Yasukawa (2001). Given that critical mathematics cannot make sense without the contexts, a distinction between the terms critical mathematics and critical numeracy is less pronounced than between mathematics and numeracy.

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