

DEMOCRATIC EDUCATION UNDER SCRUTINY: CONNECTIONS BETWEEN MATHEMATICS EDUCATION AND FEMINIST POLITICAL DISCOURSES

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During the last decade English speaking democracies have shown a marked new interest in the processes and structures of education for the preparation of active and responsible participation of citizens in contemporary society. This renewed interest, at least as evidenced through a proliferation of educational inquiries, reports and recommendations, has been shaped both directly and indirectly by local, national, international and global issues. The changes signal a new set of priorities for educational provision, and these changes in turn have implications for social and cultural practices within education. Curricula have received renewed attention, not only with a view to laying bare those knowledges deemed important for progressive national development, but also for the promotion of social justice.

Political changes to national purpose and intent provide a context to critique a national mathematics curriculum. My discussion is located in New Zealand where new forms of emancipatory politics, as framed through a 'politics of inclusion', provide an opportunity to initiate reform related to girls and mathematics. Whilst the democratic project and its links with curriculum has informed a substantial and important body of work in education, these analyses have not explicitly made connections between the female citizen of democratic societies and the female learner in mathematics education. Questions about the female learner are not new; they have preoccupied feminists in mathematics education for decades now. Yet such questions are typically viewed as unrelated to nationhood and citizenship. In a context in which mathematics education has "reached a turning point" (Boaler, 2000, p. 1), evidenced through what Lerman (2000) calls "the social turn" (p. 19), the intent of this article is to make some early connections between gender work in the field and democratic representation. The central issue here is to address questions about girls in mathematics, conceptualised as political entities rather than simply as cognising agents.

In the sections which follow I explore the role which the New Zealand mathematics curriculum, Mathematics in the New Zealand Curriculum (MiNZC) (Ministry of Education, 1992), plays in framing gendered identifications in relation to the contemporary understandings of democratic provision within New Zealand. In the first section I provide a brief overview of the dominant features of modern democratic provision and whom it purports to represent. I then look at the ways in which an inclusive politics frames ideas of 'outsider status' constructed in the official school mathematics curriculum. I map the categories and concepts of the curriculum document, as they relate to girls to reveal how categories of gendered difference are officially named in mathematics. Deconstructing the categories of the gendered schoolgirl as established through the language of a curriculum document allows us to see how these terms may operate for half of the student population.

In the final section I gesture towards Derridean ideas of difference for a democratic politics of coexistence for mathematics education. Granted the particular document which informs the discussion has been written for a very situated locale. However the points which it clarifies and the issues it raises may have relevance for other national conditions and circumstances.

Modern Conceptions of Democratic Representation

Democratic forms and events, and their historical exercise of power for the ordering collective life, have been the object of much critical attention in social, political and moral theory (Dietz, 1998). The modern conception of democratic social organisation stands itself up against formulations of democracy within ancient Greek and Roman society in which certain legitimating practices of social inequality ensured that the demos or people who held political power were free-born men. Today global agendas of democratisation and citizenship appeal to ideals of universal freedom and equality and these, in turn, have enhanced the status of democratic social organisation as a current index of human development.

Precisely who qualifies as a candidate for democratic representation? Democratic provision is said to be “developed in the name of all human beings as creatures able to exercise their reason” (Yeatman, 1995, p. 46). Citizens assume equal status, with respect to rights and duties, and the equality of opportunity promised anticipates equal opportunity to life, liberty and the pursuit of happiness. It is a project in which a multiplicity of citizen identities is given representation. The collective ‘we’ drawn together from these multiple identity formations is said to enjoy “a direct sense of community membership based on loyalty to a civilisation which is a common possession” (Marshall, 1965, p.101, quoted in Wexler, 1991).

The feminist critique of the concept of universal representation is well documented (for example, Mouffe, 1992; Pateman, 1985, 1988, 1989, 1992; Yeatman, 1988; Young, 1990, 1995, 1997). These feminist political theorists claim that the idea of the reasoning individual in liberal political theory, conceived of in gender-neutral terms, is problematic. Pateman (1985) explains that as a primary organiser employed to connect the individual and the nation state, the notion of citizenship was based upon assumptions about differences between men and women, and in this conceptualisation only particular and privileged identities could and have exercised their democratic rights to the full. Precisely because “women were incorporated differently from men, the ‘individuals’ and ‘citizens’ of political theory; [and because] women were included as subordinates, as the ‘different’ sex, as ‘women’” (Pateman, 1992, p. 19), the concept of female citizenship has remained on the outside of a relevant and just understanding of the state. As Foster (2000) puts it: “there is an enormous gulf between the apparent guarantee of full citizenship for women and women’s actual lived experience of that guarantee” (p. 204).

For modern nation states rational autonomy is a prime political and social aim. This aim can only be achieved through an epistemology which places the reasoning individual at the centre as independent and detached. If integrity is the individual’s principal value, then reasoning is his defining feature. What an historical study would reveal is how mathematics came to be intimately linked with the logic of rational argumentation. “For many... mathematics is reasoning. Logico-mathematical structures are the structures of rational thought” (Walkerdine, 1988, p. 6). Marking these structures of logic in anticipation of the rational autonomy of future citizens, key terms such as ‘coherent’, ‘consistent’, ‘unambiguous’, ‘calculation’, ‘control’ (MiNZC, p. 7) all operate on school mathematics in New Zealand in such a way as to determine what is possible to think, say and experience.

Connections between reason and the social organisation of power have been unmasked by a number of theorists. Walkerdine’s (1988) concerns about the rational actor in the state who transcends particularity and contingency are well known. In *The Mastery of Reason* Walkerdine demonstrated that rational logical structures and the theories of politics and knowledge which they inform, have been developed by a small group who occupy privileged positions. Furthermore the universal autonomous reasoner, conceptualised as a disembodied, de-passionate, de-particular citizen of the state, prompts an understanding that rationality is shared by all individuals, irrespective of gender, history or culture. As Walkerdine (1989) argues:

In a nutshell... ideas about reason and reasoning cannot be understood historically outside considerations of gender. Since the Enlightenment, if not before, the Cartesian concept of reason has been deeply embroiled in attempts to control nature. Rationality was taken as a kind of rebirth of the thinking self, without the intervention of a woman. The rational self was a profoundly masculine one from which woman was excluded, her powers not only inferior but also subservient. (p. 27)

Foucault (1978), in his later work, has described how systems of power actually produce the subjects they subsequently come to represent through various concealed practices of exclusion and inclusion. In Foucauldian understanding identities in schooling are created to some extent through the political and social order made explicit in official educational documentation. Ideological versions (Luke, 1995-6) of the world of girls in school mathematics which are constructed, locate and define female learners. Those categories of gendered difference named are not merely linguistic representations but become discursive artefacts, demanding particular subjectivities by constituting and regulating the mathematics schoolgirl in particular ways. The status of rationality then becomes a very important issue in understanding the process of subjectification in MiNZC.

A Politics of Inclusion and School Mathematics

A politics of inclusion draws its inspiration from forms of politicised knowledge produced by a myriad of political groups: black power, peace, feminist, environmental movements, to name a few. Drawing on the social structures and circumstances of people who exercise minimal political authority, political theorists currently reveal a commitment to “changing the subject” (Henriques, et al., 1984) of mainstream liberal Anglo-American politics. In the advocacy for more inclusive forms of democracy, efforts have been

made to determine how various categories and circumstances differentiate people and what those effects might be. The objective is to develop “ a conception which would accommodate all social cleavages simultaneously” (Leca, 1992, p. 330).

This more recent form of democracy is a political mode that endeavours to undo some of the central assumptions that have governed political forms, events and identities. Reaching out for the participation of all members of the society in making decisions which affect their lives, it endeavours to let the voice of those people who exercise positions of minimal political authority be heard. A society encompassing the inclusion and participation of all groups is said to celebrate diversity, multiplicity and heterogeneity for enriching the possibilities of human life. These positivities are located within a context of struggles for social, economic and civil rights which have shaped the society’s history and formed the basis of its constructions of equality. Yeatman (1996) notes:

In our current postcolonial and postpatriarchal world, those who the sovereign subject cast as its others to know and master have insisted on their becoming subjects in their own right. When women and indigenous peoples insist on their own subject presence within the life of the democratic polity they radically illuminate the fact that political subjects can be very different from each other in how they are and what they demand of politics. In doing so, they put on the table so to speak this conception of politics as a project of working out the terms of co-existence between differently positioned subjects. (p. 4-5)

Contemporary models of citizenship in New Zealand are framed within a new cultural politics of difference (Brooks, 2000). Political identities and relations in New Zealand have a young and volatile history and can be traced back to the signing of the Treaty of Waitangi in 1840 by Maori chiefs, guaranteeing local authority to the Chiefs over their affairs, even as the British Crown assumed sovereignty. In constructing current political identities and relations around the specifics of the Treaty of Waitangi, the intent has first and foremost been the creation of a bipolar politics for Pakeha and Maori. However the establishment of bicultural forms of nationalism is not at the exclusion of the voice of other social groupings. The politics of inclusion practised in New Zealand ostensibly offers women and other traditionally marginalised groups opportunities for social advancement (Brooks, *ibid.*). This current form of political practice provides an opportunity for us to consider the implications of this wider inclusive thinking within the country on representative models of citizenship with regard to gender, as they are mirrored in educational discourse.

MiNZC demonstrates a commitment to the aims and values associated with envisaging and building a new form of nationalism. In political terms the text is oriented retrospectively to the forms and events of local history, and prospectively to both the current and anticipated inclusion of diverse and different identities. The document clarifies what it means to be a subject and formulates an agenda for change with relevance to individuals who have been subjugated in discourses. In the domains which it stakes out, a theoretical space is created in which those who had not meshed with the mainstream Western political theory can now speak.

In the section titled ‘ Catering for Individual Needs ’, a discourse of knowledge about the learner as a construction of ‘ difference ’ circulates around notions of ability, background, gender and ethnicity. This educational discourse of difference constitutes the ‘ different ’ learner as a pathological, cultural and gendered subject through the constructs ‘ lower ability ’, ‘ exceptional ability ’, and through the categories ‘ Maori students ’ and ‘ girls ’.

The suggested learning experiences in this document include strategies that utilise the strengths and interests that girls bring to mathematics. Techniques that help to involve girls actively in the subject include setting mathematics in relevant social contexts, assigning cooperative learning tasks, and providing opportunities for extended investigations (New Zealand Ministry of Education, 1992, p. 12)

And later:

Girls early success in routine mathematical operations needs to be accompanied by experiences which will help them develop confidence in the skills that are essential in other areas of mathematics. Girls need to be encouraged to participate in mathematical activities involving, for example, estimation, construction, and problems where there are any number of methods and where there is no obvious ‘ right answer ’. (*ibid.*)

These texts mark out what comes to count as mathematics in school - neither non-routine mathematical operations nor single-method and single-solutioned problems. Moreover, these semantic resources spell out that school mathematics is clearly gendered; that

certain engagements and positionings are made available to the female learner in relation to male students' engagement and positionings. Assigned to a classificatory grid already formulated for her, the female learner enters this politics of discourse from a different location, with a different motivation and with a different reading of and access to power. In particular boys are said to have confidence in multifaceted approaches and solutions, whereas girls do not. Precisely because deficiencies within girls are assumed, the text regulates and governs girls through the categories it fixes on them. Arguably, the vision of equality and self-improvement underwriting the prescriptive remedies and packaged answers offered (' needs to be accompanied ' ; ' will help them ' ; ' need to be encouraged ') has considerable potential for the construction of a new form of politics.

Yeatman (1995) would maintain that this conception of oppression/liberation is based on the " utopian belief that it is possible to actualise the modern values of freedom and equality in an inclusive way" (p. 50). Such ideas presuppose the ' oppression ' is self-evident, that it is equally shared, and that its cause is able to be specified. In the text, claims of emancipation, transcendence and freedom from oppression sit uneasily alongside a regulation of gender identity. By naming and establishing categories of difference and gendered self-other identifications, social processes of regulation and control are in fact instituted even as a commitment to developing non-sexist strategies for producing self-managing students beyond the constraints of traditional gender categories is declared.

Anticipating and encouraging the proliferation of girls' general mathematical inability runs up against evidence from numerous researchers (for example, Alton-Lee & Praat, 2000; Blithe, 1993; McDonald, 1992; New Zealand Ministry of Women's Affairs, 1998) that New Zealand girls' achievements in mathematics has for some time equalled or surpassed those of boys. The same is true for the mathematical performance of girls in many other countries. The problem is that the girl's identity is taken as transparent and universal, when, clearly, she has not only a defined history but also a mobile relationship to the world.

A Strategy for Pedagogy

In many cases in the past, students have failed to reach their potential because they have not seen the applicability of mathematics to their lives and because they were not encouraged to connect new mathematical concepts and skills to experiences, knowledge, and skills which they already had. This has been particularly true for many girls, and for many Maori students, for whom the contexts in which mathematics was presented were irrelevant and inappropriate. These students have developed deeply entrenched negative attitudes towards mathematics as a result.

An awareness of these issues has led to improved access for girls to mathematics, but the participation rate of female students in mathematics continues to be lower than that of male students at senior school level and beyond. This limits later opportunities for girls and women. (New Zealand Ministry of Education, 1992, p. 12)

Conflating lack of girls' (and Maori students') success with the subordination of their interests, a pedagogical strategy is carved out: the teacher contextualises mathematical problems within distinctly female interests or strengths. Girls' ways of being in the world are connected in classroom practice with mathematical knowledge. What counts as ' doing mathematics ' for girls is benchmarked and requires that the teacher makes connections between girls' ways of being in the world with mathematical knowledge. When mathematical knowledge is grounded in its feminine application in the classroom, the power/knowledge relationship authorised moves beyond the girl and the institution of mathematics education to the parties within the pedagogical relation - the teacher and the female learner.

Providing a place and power for women and girls to speak is the motivation behind revisionist attempts to ' find a voice ' for girls in school mathematics (for example, Becker, 1995; Burton, 1995; Damarin, 1995). I have noted elsewhere (Walshaw, 2001) how such a mathematical reconstruction stands in opposition to traditional understandings of knowledge and how the establishment of a speaking position has wider social implications for the female learner. Many feminists (for example, Yeatman, 1995; Weedon, 2000) have noted, however, that the issue of speaking on behalf of girls is not so straightforward. Appeals to ' experience ' as universal and fixed have the tendency to naturalise girls' difference from boys in school mathematics. The possibility of examining those assumptions and practices that excluded those who are different is foreclosed. Weedon has argued that it is not enough to consider girls' experience as the authoritative evidence grounding knowledge claims. As a representative model of ' citizenship ' the curriculum document cannot subsume ' girls ' under one universal and homogenising category. Incommensurables will inevitably abound.

A Democratic Politics of Coexistence for Mathematics Education

Feminist interventions in the field of formal knowledge, epistemologies and those cognitive fields defined by mathematics, construct female learners as a homogeneous collective in relation to experience of mathematics. Butler (1998) questions whether it is possible to actualise a category constructed of coherent and stable subjects. Is it possible to instantiate universal values and ways of knowing among a collective without producing, in turn, new excluded subject identities? The difficulty is that when an identity claim on behalf of a group is advanced this claim simultaneously denies reciprocity (Yeatman, 1995, p.197). Philanthropic in rhetoric, a politics of inclusion works ultimately “to confirm the old power structures, whether these be patriarchies or neo-imperialisms” (Gunew and Yeatman, 1993, p.xiv).

Butler (1998) suggests:

If a stable notion of gender no longer proves to be the foundational premise of feminist politics, perhaps a new sort of feminist politics is now desirable to contest the very reifications of gender and identity, one that will take the *variable* construction of identity as both a methodological and normative prerequisite, if not a political goal. (p. 278) [italics added]

To avoid the ‘ethical ambiguity’ (Bartky,1990) which separatist politics creates, Yeatman (1996) proposes a “democratic politics of coexistence” (p. 9), based on intersubjective relations. Central to her democratic politics of coexistence is an understanding of intersubjective arrangements based around the terms of an internally fractured subject and fragmented community. Difference in this proposal is a negotiation arising from “loose alliances, relations of resistance and mastery, and configurations of fluid interests” (Blake et al., 1998, p. 62), and this leads to the idea of a politics representing the interests of women, not conceptualised as a unified group, but as diverse. Yeatman (1995, p. 15) argues that such an understanding and accommodation of difference leads to “a politico-ethical orientation” which becomes the foundation of the “bond or tie of citizenship” for emancipatory politics. Morris (1992) develops these ideas in her “differential or ‘diasporic’ identity politics understood as an historical, as well as cultural production carried out in the midst of, precisely, flux and change” (p. 207).

Derrida (1978) has provided a robust theorising of these ideas and offers the notion of difference as a challenge to ever-familiar ideas of wholeness, totality and closure. According to Derrida, fixed oppositions which derive their meaning from an established contrast where one term is prior to or dominant over the other, conceal the extent to which they are in fact interdependent and hierarchical. In Derrida’s theorising, the question of difference is a question of suspending temporal-space in which the ‘whole spectrum’ can never be complete. Difference marks all totalities as merely localities dependent on relationships. To capture this understanding, Spivak (1989) proposes the English translation of deferring as more in keeping with Derrida’s intentions for difference, than the meanings which derive from the word differing. Difference, for Derrida, is no longer reducible to an opposition between identity and difference. Rather it defers the identity of either term against a play of identification and differentiation, which never fixes either identity or difference. This is an important idea – one which shifts the locus of the act of valorising the subject from the realm of essential and unchanging ontological conditions and circumstances to the realm of provisional and partial claims.

To understand Derrida’s argument, we need to think of identities as multilayered, complex, and subject to development and change over time. We all have many identities, each of which bear particular features. For example, a school girl might be simultaneously, daughter, sportswoman, music lover, babysitter, non-achiever in English, accelerated in mathematics, movie-goer, etc. In all these identifications she is constantly involved in negotiating which aspects of her identities will be privileged and accentuated and which parts will be suppressed or ignored. It is not possible to trace her identity to a “definable origin because [identity] is an originating activity incessantly taking place” (Butler, 1987, p.131).

Political theorist Sheldon Wolin (1992) writes:

A political being is not to be defined... as an abstract, disconnected bearer of rights, privileges and immunities, but as a person whose existence... draws its sustenance from circumscribed relationships: family, friends, church, neighbourhood, workplace, community, town, city. These relationships are the sources from which political beings draw power – symbolic, material and psychological – and that enable them to act together. (p. 251-2)

For the girl in school mathematics, choosing one's identification is a process which is not wholly conscious but nevertheless accessible to consciousness. It involves the interpretation of a cultural reality which is fraught with conflictual meanings, weighted with sanctions, taboos, prescriptions and hierarchies, all framed by hierarchies within a discourse ostensibly democratic. There is no straightforward correspondence between gender identification and the depiction of female learner found in official curriculum policy documents which underlie the democratic education project.

Conclusion

This article has drawn on a number of perspectives to provide a critique of ideas about democratic provision. These perspectives, as diverse as feminist philosophy and political, social and educational theory, were employed to look afresh at democratic education, specifically at the gender project in mathematics education. My point of departure has been to attend to gendered constructions made explicit in an official curriculum text and to link those constructions to political democratic constructions. The analysis of female citizenship as set out in the 'same' and 'different' discourses of democratic provision encourages us to address key questions concerning the way in which the female learner in New Zealand is constructed in texts, and hence, arguably, in contemporary classrooms.

My analysis looked at social/political constructions of the central player in the democratic project. The idea of citizenship in liberal political theory, conceived of in gender-neutral terms, is considered problematic, and the modern ideal of universal equality, and its paradoxical role in the 'emancipation' of women, is conjectured as a merely rhetorical category. Alongside these considerations constructions of the female learner within MiNZC were scrutinised. Looking through description and precedent the analysis revealed those discourses operating as instruments and effects in the centralisation or marginalisation of girls from the mathematical community. The intent was not to censor the usage of these terms but to subject them to critical reinscription and redeployment to generate a different analysis in the consideration of who qualifies as a subject in mathematics in New Zealand schools.

Analysing the discourse of some sections and paragraphs of MiNZC has provided a view of the constructed version of the student as a gendered learner. The discourses of rational logic, of a revised pedagogical interaction, and of difference working for girls' inclusion, work through the text and each of these produces particular forms of organisation and forms of sociality. Within each of these discourses the female learner is centrally and strategically implicated and it is through the endorsement of these particular constructions of gender that the girl learns, together with other discursive practices in operation within her world, how to recognise, represent, and 'be' a girl in school mathematics.

What this analysis has revealed is that MiNZC is part of the modern technologies for the systematic 'democratic' governance of people and hence it has political knowledge effects. These effects range from pedagogical apparatuses of observation and regulation, to the mapping of learners onto a scale of classification, to the gatekeeping of meritorial rewards or impediments for gendered learners. The place of the disciplining power of the official policy document, in understanding knowledges of the mind of girls, then becomes very important to our understanding of girls and school mathematics. When viewed in this way, MiNZC becomes not only an analyst but also a powerful producer of political knowledge.

This kind of interrogation is useful in that it demonstrates the historical and textual contingency of the girl in school mathematics. It reveals how power operates through knowledgeable discourses and practices, casting a gaze on the female learner by ordering, assessing, categorising, and normalising her. However it is merely a first step, but one which teaches powerful lessons about the gendered world and democratic educational provision.

As Dillabough and Arnot (2000) argue,

It is time to change the ways in which we struggle for democracy in education – to abandon the 'lion's skin' and construct new definitions of citizenship which are based upon the needs of contemporary women. Clearly this work must move beyond a feminist engagement with voice, subjectivity and difference. It must also examine how political formations and social constraints structure the relationship between gender and democracy in education. One task for feminists is, therefore, to problematise the gendered premises of democratic education drawing upon the concerns raised by feminist political theorists, whilst still defending a 'radical democracy' which accords women political agency and the possibility of solidarity without repressing difference. This is no easy task but we believe it is one well worth defending. (p. 38)

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