DEMOCRATIC EDUCATION -
DOES IT EXIST - ESPECIALLY FOR MATHEMATICS EDUCATION?

Derek Woodrow Manchester
Metropolitan University Crewe School
of Education

This paper explores the concept of democratic education; taking issues concerned with democratic citizenship in modern democratic societies and ways of teaching which reflect democratic values. Can individualistic teaching and over-respect for individual rights be consistent with democracy? In modern media-power can democracy even exist or are we all just manipulated? Does the autocratic authority imbued in mathematics allow for democracy anyhow?

My concern for democratic education derives from two distinct experiences. Firstly was my involvement with the antiracistimuiticultural debate of the middle to late 1980's. On a general level was the Swann Report, with its call for a 'Curriculum for All', and more specifically the tragedy which led to the MacDonald report and the recognition of institutional racism in schools, whether formal racism or informal racism. These concerns struck at the consciousness of teachers in that period. Those concerns have been largely suppressed (or dissipated - make your own emotive choice) and we have seen the debate move towards the safer ground of intercuIturalism and global understanding, or from an higher education perspective 'Europeanisation'. Much of this movement has been a consequence of the introduction of the National Curriculum and its implied principles. There is no internationalism in that curriculum, no celebration of a pluralist culture and no sense of diversity. The mathematics debate in the 1980's contained some mirroring of those concerns and there was a significant debate about multicultural and/or anti-racist mathematics, with the notion of enculturation examined at one end and diversity of content at the other. There was an intense debate as to the part that mathematics could play in the debate, ranging from removing the Eurocentrism of the curriculum to the recognition of hidden social messages within school mathematics content. Ray Hemmings, Alan Bishop, George Joseph, Urbiratan D'Ambrosio, and many others (see Woodrow, 1989) contributed to a growing concern. All that has disappeared in the wake of the National Curriculum in Mathematics, with its clear exclusion of personal concerns in learning and a concentration on delivering the approved content and and the provided packages.

The second interesting preoccupation in the later 1980's was the development in secondary schools of the notions of flexible learning. This came about by the subversion of the government initiated Technical and Vocational Education Initiative by a number of visionary educators into a much more individually responsive curriculum. TYEI led to a real concern for the motivation of reluctant learners and developed an action based curriculum with clear vocational activity as a potential driver of learning. This developed into flexible learning with individual motivators and individual target setting, responding to pupil motivation and interest and utilising and harnessing those interests to achievement. It had a particular concern for the introduction of information technology skills, not in terms of the programming and mathematical aspects which up until then had dominated the field, but in terms of user oriented and work-skill based activities. Maths in this process was frequently sidelined, not encouraged by the TVEI criteria from being engaged and not generally interested in challenging and changing to meet those criteria. When reviewing the 'alternative curriculum strategies' developed in that period mathematics was often missing and dealt with separately and

outside of that curriculum. Where mathematics did appear it was confined to applications within other problem-settings, and it was almost universally restricted to calculation activity. Mathematics did develop individualised work schemes and there was some attempt at generating 'project work' with 'real-life mathematics' occasionally surfacing, but it did this outside of the mainstream of TVEI and flexible learning, often with different motivations and in particular without the social motivation of the major movement.

The immediate concern for democracy was stimulated by two recent studies. Firstly, writing in a recent book about 14-19 education Hustler and Hodkinson (1996, p.111) state

> "One answer, then, about why we should adopt student-centred learning approaches draws on what might be termed democratising ideology. Fundamentally it is about social justice .... .It can be argued, for example, that it is a student's right to have access to student-centred learning practices, as part of any educational system which has autonomy or self-actualisation as a key purpose"

Two aspects of this quote struck me as interesting, firstly we never use this as an argument for individualised learning in mathematics. Individualised activity in mathematics was first discussed by Banks (1971) who proposed the use of the methodology as a response to a particular shortage of mathematically qualified teachers on London. It was in this context originally proposed as a mechanism to make the curriculum teacher-proof so that pupils might learn despite the teacher. More acceptable justification was then provided by suggesting its use in the context of allowing pupils to progress at their own level in mixed ability situation, so that the teacher is not faced with conflicting levels of demand in the same area of concern to which teachers find it hard to provide differential responses quickly. By varying the tasks the teacher can differentiate the questions. It was still in this form a control issue. None of this is about pupils rights.

More significantly for me, however, is the possible assumption in the quote from Hustler and Hodkinson that the notion that individualisation is either a necessary or sufficient condition for democracy or justice. Hustler and Hodkinson (ibid. p. 115) drawing on A vis (1991) do indicate that

> "student-centred learning rarely involves real sharing of control but, by focussing on the individual learner, directs attention away from societal and institutional forms of 'disem-powerment', for example due to inequalities of class, ethnicity or gender. In particular there is an unquestioning acceptance of the social, political and economic status quo .... blaming the individual victims for their educational failures"

Within higher education the flexible learning movement has developed into the Guidance and Learner Autonomy project, extending this notion of empowering and enabling the learner to take responsibility for their learning. The process contains an underlying principled commitment to the rights of individuals and removal of the tyranny of the over-traditionalised academia.

This discourse about individualism resonated with an argument I had been developing over the past year (see Woodrow, 1994 and 1995) which recognised that radical constructivism (architypal individualisation in theory) had grown up in a culture of right wing Thatcher/Reagan-ite societies and within the two most reactionary subjects of the curriculum, science and mathematics. This is a view

echoed by Noddings (1993, p.159) "Constructivism as a pedagogical orientation has to be embedded in an ethical or political framework". Individualism is a Western concept which does not fit as easily into other philosophies and cultures, as Howard Gardner (1993, p.273) comments:

> "Rather than being an object of study, the world is an active subject whose impact is felt by the passive individual. How different this perspective is from that customarily assumed in a Western particle society. The emphasis on the self as a single atomised particle is a peculiar legacy of Western political, philosophical, and literary traditions, dating back perhaps to Greek times and apparently unrivalled elsewhere in the world"

As a psychology, radical constructivism is particularly Anglo-American, and as suggested by Avis effectively places the onus for learning or not learning inside the mind of the pupil and not the responsibility of the actions of the teacher who is merely there to aid the pupils imagery. Where there is no society then all responsibility for failure - be it unemployment or learning - rests with the person themselves. They are not enterprising enough or just don't have the right internal language. Justice and rights are societal terms, they do not concern hermits! Of course there has been reaction to this movement, with the initiation of 'social radicalism' and an attempt to tread a more centralist path. Lave (1988) and Resnick (1991) have described a different movement towards the notion of knowledge seen as socially held and culturally determined, to the extent that what we know differs with who we are with. I have a feeling that the notion of democracy is impossible without society, without the interaction of people, and is some-how inimical to isolation and individualism. The rights of the individual only exists in a social dialectic.

What then is democracy? There are two basic definitions. On the one hand is political democracy, best expressed in the American constitution, 'the government of the people, by the people, for the people' which is clearly a statement about groups of people not individuals. Alternatively democracy is concerned with human rights and freedoms, (well described by another American, Norman Rothwell, in his famous pictures of 'The Four Freedoms': freedom of speech, freedom from hunger and need, freedom to work and freedom to worship) and the protection of individuals within society.

As an aside I wonder at the existence of any more of the possibility of political democracy in the modern Western world. The manipulation of public opinion through all pervasive media management makes the holding of private or individual opinion doubtful. We have the views we are led to have. The history of the eighties is that of creating new and autocratically predetermined public agendas and concerns, of realigning public opinion and concerns to a specified agenda currently that of entrepreneurial criteria, of individual responsibility and of competitive elitism rather than cooperative excellence. The simple action (in about 1981) of moving the stock-market report from the end of the news broadcast into the centre of the news broadcast gave it a reality and acknowledgement it would not otherwise have, no longer peripheral it become newsworthy and significant. We now accept some questions we would earlier have refused to consider, and ignore others that were once central - such change is not new, but the degree of manipulated determinism in those changes is new. It is in this sense that the possibility of real democracy in the Western world is essentially questionable in the face of such power.

Even such superficially enabling doctrines such as 'empowerment' are now coming into question.

Heathcote (1996) writing about the democratisation of health care promotion and health education, poses significant criticism of the outcome of the 'empowerment' concept as resulting in empowering the already empowered, of enabling those who have the means of ensuring their rights, of reemphasising the strength of the middle class. The notion in education of 'empowerment' like that of 'autonomy' is rooted in real concerns for democracy and individual/personal rights, but the outcomes are complicated by the need to place these notions within other complex contexts such as social rights, social ordering and social stability which enable such individual rights to have validity and reality. Providing a vibrant, flexible learning, student centred environment works well with the motivated and involved. These may, it is true, be a different group from those who respond to traditional learning modes and this was the focus for the Alternative Curriculum Strategies movement, but it may not be a universal panacea and will itself have differential outcomes. The current vogue for imposing a 'democratic' and 'market-led' society on Eastern Europe is clearly not necessarily a liberating and restorative move. The spread of capitalism can be seen as being required by capitalism to expand markets in order to maintain market growth in Western economies which have outproduced their own needs. There is widespread concern that world-bank investment ultimately only serves to fuel rich economies by creating increased demands for their services (reverse investment is a normal condition of grant). The 'we know best what you need' is antidemocratic in both senses of the term, yet is a growing symptom in a disempowered and consequently passive society. Teachers feel helpless in affecting the curriculum so they withdraw from the debate. We see in the mathematics debate the capture of the school curriculum by University mathematicians, quite right in pursuing their objectives by quite wrong in assuming that those are the only objectives.

Returning, however, to the mathematical reaction to democracy, I am drawn to a description of the purpose of mathematics education defined by Professor Perry in a paper read to the British Association in Glasgow in 1901 (which I shall give in full, though it is item 6 which attracts me in this context):

1. In producing higher emotions and giving mental pleasure. Hitherto neglected.
2. a. In brain development b. In producing logical ways of thinking. Hitherto neglected.
3. In the aid given by mathematical weapons in the study of physical sciences. Hitherto neglected.
4. In passing examinations. The only form that has not been neglected. The only form recognised by teachers.
5. In giving men mental tools as easy to use as their legs or arms; enabling them to go on with their education (development of their souls and brains) throughout their lives, utilising for this purpose all their experience. This is exactly analogous with the power to educate one's self though the fondness for reading.
6. Perhaps included in 5: in teaching man the importance of thinking things out for himself and so delivering him from the present dreadful yoke of authority, and convincing him that, whether he obeys or commands others, he is one of the highest beings. This is usually left to other than mathematical studies.
7. In making men in any profession of applied science feel that they know the principles on

which it is founded and according to which it is developed.

8. In giving to acute philosophical minds a logical counsel of perfection altogether charming and satisfying, and so preventing their attempted to develop any philosophical study from a purely abstract point of view, because the absurdity of such a view has become obvious.

(quoted in Ministry of Education, 1958)

One can see in these Victorian values the essence of democratic education, defined by Halstead (1995, p.lll) "Education for democratic citizenship is an education in those political beliefs and values on which the very existence of a liberal state is based.". This is predated by Matthew Arnold in his declaration "But governing the teacher's whole design of instruction in these know ledges should be the aim of calling forth, by some means or other, in every pupil, a sense of pleasurable activity and of creation; he should resist being made a mere ladder with 'information'" (quoted in Ministry of Education, 1958).

Current mathematics education in schools appears to be about learning mathematics for no purpose other than to know mathematics. Enlightenment and education take, at best, second place. In England mathematics teachers used to take responsibility for their curriculum. The reforms of the 1960's, 1970's and 1980's were all teacher led. The National Curriculum appears to have removed such responsibility. Watching students, now increasingly in schools, being mentored by teachers one gets the over-riding sense is that the teachers are now only (and centrally) concerned with delivering the given curriculum, generally through pre-prepared packages. There is little doubt that they have become increasingly expert at delivering what they are given but have little interest or expertise in creating or recognising what they delivering. Debates about trigonometric functions as opposed to trigonometric ratios are irrelevant to modem-day mathematics teachers. Discussion about developing notions about metric spaces in teaching graphical work would be out of place, sufficient unto the day is the content thereof.

Within any debate about democracy lies the dilemma between authority and autonomy, human rights need authority to maintain them, society needs to protect individuals. At the root of the flexible learning, student-centred movement lies the notion of individual autonomy, and the promotion of self assertion and self decision, yet democracy depends upon the (voluntary/majority enforced) denial of this when social cohesion and the social good are implied. On such contradictions reality is created. The autonomy within mathematics is equally constrained by validity and truth. Proof not assertion are the end goals. The respect for individuals found in Western (and especially British and American) societies does not always lie comfortably with the authority inherent in mathematics and perhaps provides some of the reason for poor comparative performance on some tests. Learning rules and learning to work within rules are different attributes. Thus Hungarian colleagues commented that in England "Not to hurt the 'self image' of the children is more important than to force them to achieve better results, there is more emphasis on creativity than knowledge" (Hatch, 1993). Many of these concerns lie with the notions of authority and correctness. Cultures which have strong respect for ancestors and elders will tend to have a view of knowledge which is heavily based on the notion of a 'body of knowledge' rather than knowledge as a creative and individual voyage of discovery. There is a delicate balance between the autocracy of tradition and anarchy of

existentialism, and it is easy for democracy to vanish or become misrepresented through imbalance towards either position. The search in mathematics and science for truth rather than goodness or quality will relate to some cultural mores rather than others. Fasheh (1982) points to this issue of authority as also relating to political needs and sees the moves towards investigatory and exploratory methods as removing or undermining that authoritarian culture which some societies feel they require. Individual identity as contrasted with belonging to a societal group be it family, ethnic or cultural, will bear fundamentally on such issues. Within each society these balances need to be sought, and within each subject discipline a balance needs to be sought. That balance has to reflect the nature and qualities which it's knowledge gives to people, but it must above all serve the needs of democratising the society in which it lies and to reflect its values and principles. These principles must contain a total commitment to cooperative living, support for ones fellow human beings and respect for their feelings and rights. To quote Noddings (1993, p159)

> "The primary aim of mathematics teachers cannot be to promote mathematical growth, although that is certainly one worthy goal. Rather, the primary aim of every teacher must be to promote growth of students as competent, caring, loving and loveable people".

This lives with difficulty in a competitive, testing, attainment measuring context. And mathematics, almost above all other subjects, gives licence to competition and comparison of failure and success. It can breed a belief in selfish and solitary seeking for self-improvement regardless and independent of anyone else. Much of mathematics is done in isolation, with little social support to the learning. Individualised schemes, now so prominent, can foster and nurture this. Yet in the end, we teach universally mathematics in schools in order to educate students, we do not universally educate students in order to teach them mathematics. Democracy is born or denied in the classroom.

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