

# Democratic Education: Does it Exist - Especially for Mathematics Education?

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Within the U.K., the notion of social responsibility has recently become a significant issue, following a sharp increase in reports of disruptive pupils and a number of horrific violent incidents, including the gunning down of young children and the fatal stabbing of a head teacher. Attention has been drawn to the issue of 'morality' in school curricula and to the teaching of 'family' as a preferred social unit. The notion of 'citizenship' and of 'society' has not yet overtly become part of the agenda. The debate is against a background of over a decade of the promotion of academic as opposed to democratic values in schooling and of individual rights rather than social responsibility.

This paper explores the concept of democratic education in the context of mathematics teaching, relating to issues concerned with democratic citizenship in modern democratic societies and ways of teaching which reflect democratic values. Can individualistic teaching and an over-respect for individual rights be consistent with democracy? Does the autocratic authority imbued in mathematics allow for democracy anyhow? Much of this article draws on the U.K. experience, but there is evidence of similar concerns from within the U.S.A. and the importance of individuals compared with social groups represents a major philosophical distinction between nearly all Western societies and other regions of the global village. The U.K. experience of right-wing political dominance provides an important case study.

## Introduction

My concern for democratic education derives from two distinct experiences. First came an involvement with the anti-racist/multicultural debate of the middle-to-late 1980s. On a general level in the U.K., there was the Swann Report, with its call for a 'Curriculum for All', and more specifically the tragedy of a playground stabbing which led to the MacDonald report and the recognition of institutional racism in schools, whether formal or informal. These concerns struck at the consciousness of U.K. teachers in that period, but have been largely suppressed (or dissipated - make your own emotive choice) during the intense debate about education and standards. The discourse has moved away from multicultural/anti-racist education towards the safer ground of interculturalism and global understanding, or from an higher education perspective towards a concern for 'Europeanisation'. This movement has been in the context of the introduction in the U.K. of the National Curriculum and its implied principles of academic standards and testing. There is not even any internationalism in that curriculum, and certainly no celebration of a pluralist culture and no sense of diversity.

The debate within mathematics education in the 1980s contained some mirroring of these general concerns, and there was a significant interest in 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 larger arena, ranging from removing the Eurocentrism of the curriculum to the recognition of hidden social learning within school mathematics content. Bishop (1988), Joseph (1992), D'Ambrosio (1985) and many others (see Woodrow, 1989) contributed to a growing global concern which led to a whole day (out of five) being committed to such issues at the four-yearly International Congress on Mathematical Education in both 1988 and 1992. This work was complemented by a rising interest in the political nature of mathematics teaching and in potential democratic commitments through the contributions of Mellin-Olsen (1987) and Skovsmose (1994), which was also raised in the writings of Noddings (1993).

All that has disappeared in the U.K. 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 the provided packages. This concern only for standards is also prevalent in the U.S.A. Darling-Hammond (1996), in her address to the AERA, said:

These days the talk is tough: standards must be higher and more exacting, outcomes must be measurable and comparable, accountability must be hard-edged and punitive [ ] Yet if we are to educate for democratic life, I believe we must be concerned about education that nurtures the spirit as well as the mind, so that each student finds and develops something of value on which to build a life whilst learning to value what others offer as well. (p. 5)

The second interesting preoccupation in the later 1980s was the development in secondary (high) schools of notions of flexible learning. This came about by the subversion of the government-initiated Technical and Vocational Education Initiative (TVEI) by a number of visionary educators into a much more individually responsive curriculum. TVEI led to a real concern for the motivation of reluctant learners and developed an action-based curriculum with overt vocational activity as a potential driver of learning. This eventually developed into flexible learning with individual motivators and individual target-setting, responding to pupil motivation and interest by 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 the mathematical aspects, which up until then had dominated the field, but in terms of user-oriented and work-skill-based activities

Mathematics in this process was frequently sidelined, essentially excluded by the TVEI criteria, and the mathematics community was not generally interested in challenging and changing to meet those criteria. When reviewing the 'alternative curriculum strategies', developed in that period as part of a European-wide 'Low Attaining Pupils Project', 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. Mathematics in the U.K. 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.

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

Two aspects of this quotation struck me as interesting. First, we never use this as an argument for individualised learning in mathematics. Individualised activity in mathematics was first discussed by Banks (1971) who proposed its use as a response to a particular shortage of mathematically qualified teachers in London - a 'disaster kit' as the article was entitled. In this context, it was 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 and pace in mixed-ability situations, 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 (see Woodrow, 1982). By varying the tasks, the teacher can more easily differentiate among the questions. Similar individualised mathematics schemes were also developed in Sweden with the IMU project (see Howson *et al.*, 1981) during this period, and much work was done on 'programmed texts'. It was still in this form a curriculum control issue and not one of freedom and 'student-centredness'. None of this is about pupils' rights - though it is about pupil responsibility, the responsibility of the individual pupil to work through the text and to make of it such understandings as he/she can. In many teaching situations, it is not the what that you do but the why that you do it which makes the difference.

More significantly for me, however, is the possible assumption in the quotation from Hustler and Hodkinson that the notion that individualisation of instruction is either a necessary or sufficient condition for democracy or justice. Drawing on Avis (1991), the authors do indicate that:

[...] student-centred learning rarely involves real sharing of control but, by focusing on the individual learner, directs attention away from societal and institutional forms of 'disempowerment', 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. (*op. cit.*, p. 115)

Within higher education, the flexible learning movement has developed, for example through the Guidance and Learner Autonomy project, and is evidenced in many of the current developments in vocational training schemes (using notions of competency profiles), 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 the removal of the tyranny of over-traditionalised academia, but it can also engender a denial of responsibility by the teacher or the institution

### Individualism and constructivism

This discourse about individualism resonated with an argument I had been developing (see Woodrow, 1994 and 1995) which recognised that radical constructivism (archetypal 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" Interestingly, however, there is another paradox in that many of those who are committed to radical constructivism would be described as 'trendy left-wingers', motivated by 'socialist' concerns for individuals and individual rights. Individualism is seen by Howard Gardner (1993) as very much a Western concept which does not fit as easily into other cultures. In a lengthy discussion related to inter- and intrapersonal interactive skills, he 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. (p. 273)

As a psychology, radical constructivism is particularly Anglo-American and, as suggested by Avis (1991), effectively places the onus for learning or not learning inside the mind of the pupil and is therefore not the responsibility of the actions of the teacher who is merely there to aid the pupils' imagery. Where 'there is no such thing as society'

(a significant statement by the British Prime Minister, Margaret Thatcher, *circa* 1984), then all responsibility for failure - be it unemployment or not learning - rests with the person themselves. They are not enterprising enough or just do not have the right internal language. It is also interesting to note that in countries where there is a clearer concern for individual rights in learning (i.e. Western countries), blame for failure to learn by an individual pupil is often attributed outside of the individual to 'the teacher' or to 'not being clever enough', whereas where more social methods of teaching are the norm (e.g. Japan and Taiwan), the blame for non-achievement is more often accepted by the pupil, who will assert that they did not work hard enough (Stevenson and Stigler, 1992).

More significantly, however, the notion of constructivist learning would be problematic in many Asian cultures, with their strong respect for the knowledge and understanding of elders, or in many African and Indian classrooms where large numbers of pupils need to be taught simultaneously. In a recent Ph.D. thesis, the Kenyan author (personally committed to a constructivist approach) commented that he held group interviews since it would be inappropriate to interview the pupils individually since they never talked one-to-one with a teacher. Recent research on the preferred learning style of Chinese pupils in English schools showed what great difficulties these pupils have with the questioning and debate of English classrooms - what they wish is to be told what to know rather than to develop understandings (Sham, 1997) "Radical constructivism can therefore be seen as a theory created to be in concert with societies in which it is assumed, societies for which individual autonomy rather than social responsibility is preferred." (Woodrow, 1995, p. 13)

Of course, there has been reaction to this movement, with the initiation of 'social constructivism' attempting to tread a more centralist path, and more recently an emerging, alternative, culturally-based psychology built from the writings of Vygotsky (e.g. Lerman, 1996). Lave (1988) and Resnick *et al.* (1991) have described a different movement towards the notion of knowledge seen as socially-held and culturally and contextually determined, to the extent that what we know differs with whom we are with. In this context, there are value judgements to be made about what social learning we wish to engage in. The debate, in widening to take this on board brings with it the influence of both context and the issue of values on the learning of mathematical content, and a discussion of values leads you directly to a concern for democracy.

It would seem to me that the notion of democracy is inimical to isolation and individualism: it is impossible without the interaction of people and without reference to 'society', and hence the value of radical constructivism is in its contribution to maintaining the debate between individuals and society. The rights of the individual only exist in a social dialectic: justice and rights are societal terms, they do not concern hermits! An interesting early debate about the paradox which must be sustained between 'rights' and 'needs' can be found in Rappaport (1981), who maps the move in the U.S.A. away from social paternalism towards individual responsibility. This same paradox needs to be sustained

(accepted, but not resolved!) in learning theories where contradictory notions such as individual construction and bodies of knowledge simply have to co-exist (Woodrow, 1995). To say that 'individuals' exist and that individuals 'construct their own thoughts' are rather banal statements until they are juxtaposed with other notions such as 'bodies of knowledge' and 'social mores' or 'citizenship'.

### Democracy and democratic education

What then is democracy? There are two basic definitions. On the one hand, there 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 Rockwell, 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. An interesting discussion of these definitions, and in particular their import for education, is to be found in Benne (1990).

I wonder at the existence any longer 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. 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. Within the U.K., we have been driven back to a curriculum dominated by 'number efficiency', not through professional belief but by public pressure carefully orchestrated by a few powerful individuals. The battle for the effective use of the calculator in schools, carefully nurtured and developed against an initially-sceptical profession which was successfully convinced, has been lost to the same small dogma-driven pressure groups. It is in this sense that the possibility of real democracy in the Western world is essentially questionable. It can, of course, be argued that true democracy has never existed except as a theoretical concept. The power of religion, of tradition and the pressure of 'belonging' has always made radical thought difficult to generate. In reviewing developments in mathematics education (Howson, 1983), it is evident that as with all educational change it rarely springs from a ground swell of common commitment, but is imposed by the proselytisation of ardent believers.

Even such superficially-enabling doctrines such as 'empowerment' are now coming into question. Heathcote (1997), writing about the democratisation of health-care promotion and health education, offers 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 re-emphasising the strength of the middle class. The 'Headstart' project in New York during the late 1970s ran into the same difficulty, namely that a project aimed at the disadvantaged was utilised by the advantaged to their profit. 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 ways of teaching may, it is true, be attractive to a different group from those who respond to traditional learning modes, but it may not be a universal panacea and will itself produce differential and discriminatory outcomes (Sham, 1997). There are examples of teachers working with disaffected pupils who themselves become disaffected with their school's society, becoming encultured themselves into a separate subculture, no longer attempting to enculture their students. Gore (1992) describes how empowering trainee teachers to create new curricula led many of them to be disaffected with the actual curriculum. Raising student mathematics teachers' perspectives into rich investigatory and exploratory work only for them to find that school mathematics is ritualistic and confirmatory can lead to disillusionment - indeed, one teacher on an enrichment course was so inspired that he could not face the reality and left teaching: ultimate disempowerment!

### National autocracy

The current vogue for imposing a 'democratic' and 'marketled' 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. The insistence on 'democracy' before aid is in many cases merely used to legitimise the true meaning, capitalise before aid. 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). It is commonly justified through a recourse to providing 'economic freedom', a notion explored in Benne (1990)

The popular equation of democracy with 'free enterprise' and 'the free market system' is evidence of the 'economic freedom' dimension of democratic ideals. (p 29)

The 'economic freedom' of the poor is not experienced as freedom but instead as an oppressive burden (p 39)

Benne also comments on the twin issues which have been touched on earlier. One is the modern problem of size, in this case of international corporations, in defining 'democracy'. The other is the commitment to imposing individualism which results in competitiveness as a driving force and compromise as the only response to conflict rather than co-operativeness as a guiding virtue and discourse as a creative activity. Mathematics teaching has readily built in measures which enable pupils to be ordered easily in terms of apparent ability. In both mathematics and science, it is normal to grade and assess against right and wrong, knowledge known or not known, rather than think about quality

and improvement. The introduction in the U.K. of school league tables has created a climate in which schools seek to be 'elite' rather than 'excellent'.

A similar question was raised by the world-wide reforms of mathematics teaching which occurred during the 1960s and early 1970s. The 'new mathematics' swept the world. Having initially arisen in America, Europe, and Britain, it was then carried by the power of evangelism to many other countries, in particular British and American texts appeared throughout Africa. Yet the nature and content of the developments in the originating Western countries were significantly different, with a general categorisation being represented by an American drive towards knowing things, a British drive towards doing things and a French drive towards understanding things (see Howson *et al.*, 1981). The various school texts produced by the three different systems of mathematical curriculum proved almost totally inexchangeable during the major reform periods. Yet these texts were transported and sold within totally different African cultures, with generally poor outcomes except for the publishers (Howson *et al.*, 1981)

The 'we know best what you need' approach is anti-democratic in both senses of the term, yet is a growing symptom in the disempowered and consequently passive society of U.K. education. Teachers feel helpless to affect 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 but quite wrong in assuming that those are the only objectives. Mathematics in the school curriculum does not exist in order to create mathematicians: it is there to educate the members of society at large.

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 the 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 science. Hitherto neglected.
4. In passing examinations. The only form that has not been neglected. The only form really 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 a 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 being developed.

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

(quoted in Ministry of Education, 1958, pp 7-8)

One can see in these Victorian values the essence of democratic education, defined by Halstead (1995) as:

Education for democratic citizenship is an education in those political beliefs and values on which the very existence of a liberal state is based. (p. 111)

This is predated by Matthew Arnold in his declaration:

But governing the teacher's whole design of instruction in these knowledges 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, p. 155)

### Whys and wherefores

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: in the U.K., the reforms of the 1960s, 1970s and 1980s were all teacher-led (Howson *et al.*, 1981). The National Curriculum appears to have removed such responsibility. Watching student teachers, now increasingly trained in schools, being mentored by teachers one gets the over-riding sense 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 are delivering. Debates about trigonometric functions as opposed to trigonometric ratios are irrelevant to modern-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.

The reaction is in part a consequence of the conflict between democratic intuition and meritocratic autocracy in modern society. The fear of tyranny of dictatorship, whether political or hereditary, which drives much of the commitment to democracy has been replaced by a fear of government by technocrats, bureaucrats or (even worse) by experts. Mathematics teachers in reforming the curriculum – albeit for the good of their pupils and society – did not manage to carry the governing society with them and were seen

as having vested interests. Only those with no direct involvement (and consequently no real expertise) can be trusted to make decisions. It is a sad indictment of our society that it assumes personal advantage and disbelieves altruism in all decision making.

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 is the end goal. The respect for individuals found in Western (and especially British and American) societies does not always sit comfortably with the authority inherent in mathematics and perhaps provides some of the reason for poor comparative performance on some international 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 on knowledge" (Hatch, 1994, p. 32).

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 the 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 and correctness 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 its 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 co-operative living, support for one's fellow human beings and respect for their feelings and rights. To quote Noddings (1993):

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. (p. 159)

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 of and independent of anyone else. Too often it is its utilitarian thrust which is emphasised. To quote Darling-Hammond (1996):

This suggests not only education *for* democracy, in the sense that we think of students needing to learn trades and good citizenship, but education *as* democracy (Glickman, 1995) - education that gives students access to social understanding in a pluralistic community by talking and making decisions with one another and coming to understand multiple perspectives. (p. 6)

Benne (1990) comments:

[...] the capacity for democratic co-operation must be a prime goal for education in a collective and conflicted world, if humanity is to survive (p. 39)

Much of mathematics is done in isolation, with little social support for its learning. Individualised schemes, now so prominent, can foster and nurture this. Yet, in the end, we universally teach 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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