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THE STATE'S ATTACK ON MATHEMATICS EDUCATION RESEARCH: A RESPONSE

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''Very considerable sums of taxpayers' money are invested in educational research, some £50-£60 million pounds a year. Much of that money is not having any benefit at all. We should ask where the money is going. My task is to question the gobbledegook that is promoted by the academics''. So says Chris Woodhead in the Sunday Telegraph (Nov. 21 1999). In this session I will argue that much gobbledegook does exist in mathematics education research, that this gobbledegook is a legacy of the mathematics curriculum reform of the 1950's/60's, that the State supported and legitimised this legacy and is therefore in no position to criticise it. I shall also argue that the State is 'merely' using the 'gobbledegook' card to legitimise the notion that education research ought to be subordinate to government policy.

Martyn Hammersley (1999) in his *Some Reflections on the Current State of Qualitative Research*, draws attention to four tendencies that he sees operating within qualitative research in education:

- *empiricism* (appeal to data. On a personal note: how many of us have had papers on qualitative research turned down because it did not contain any 'data'?).
- *instrumentalism* (that research should be subordinated to politics and practice-something that is much valued by the present government).
- *postmodernism* (an 'umbrella heading' for 'an unseriousness about the task of research').
- *ethicism* (tendency to see research almost entirely in ethical terms).

Constructivism can be placed under any of the four categories, but the main category has to be postmodernism. Many constructivist writers certainly betray a lack of seriousness regarding fundamental philosophical issues and ignore the scholarly and professional input in this two and a half thousand year old area of research (Matthews 1998a). Many constructivist writers in science education and (we would argue) mathematics education, engage in 'soft focus' writing with the unfortunate propensity for intellectual laziness manifest in argument by citation such as 'since Kuhn so and so' (Matthews 1998a). However, the problem is not only a lack of seriousness. Hammersley, in his very short article, makes the point that the problem of postmodernist research is a fundamental one:

> If you deny that knowledge is possible, in the common-sense meaning of that word, at the very least you cannot take seriously the task of research as the production of such knowledge.....It is worth noting that postmodernists' use of the arguments of philosophical sceptics is always selective. They do not, in practice, refrain from making knowledge claims themselves. Some seem unaware of this, applying sceptical arguments selectively and thereby using epistemological radicalism to bolster political radicalism. This leads to the politicisation of research.

How many scholarly articles in mathematics education assert von Glasersfeld's (1995) radical constructivist premise that knowledge is not of the world ('ontological reality') but of making sense of experience, or assert Ernest's (1991) social constructivist claim that mathematical knowledge is objective because it is socially accepted? As for bolstering 'political radicalism' (a term that is arguably inappropriate), constructivism stakes out the moral high ground with notions of emancipation and empowerment (Matthews 1998b).

Much postmodernist writing contains gobbledegook in the form of pure meaningless rhetoric, as evidenced in Sokal's Hoax, and mathematics education seems to be no exception:

> But as with Lacan (and Wilden, 1968), Derrida sees relatively stable signifiers being associated with a fluid underbelly, comprising a signified field which sweeps out to occupy the whole of consciousness, and indeed, the unconscious. Both presence and absence are located by the signifier. Any loss incurred in the attempt to articulate remains attached to the signifier seeking to replace it. The signifiers are haunted by what they squeeze out. Meanings are derived only through retrospective examination of the flow of signs. The component signifiers do not have implicit meanings, only relational associations with other signifiers in the chain (Brown 1999; p.18)

Yes, but what does it all mean? If, for the postmodernist, meaning is personal and selective and unrelated to the meaning the author is trying to convey, then it would be 'unreasonable' to ask 'what do you mean?' Postmodernism provides the very licence to convey gobbledegook!

Most of the gobbledegook in educational constructivism, however, does not appear to be so extreme: merely soft-focus writing with argument by citation. But it is gobbledegook nonetheless, in the form of pet-theories elaborated on spurious philosophical assumptions without any serious consideration given to the history of professional research in this area! What we have is tripe waxed lyrical:

> Kozulin argues that it is incorrect to consider language as correlative of thought but that rather language is a correlative of consciousness. He argues that the mode of language correlative to consciousness is meanings and that the work of consciousness with meanings leads to the generation of sense, and in the process consciousness acquires a sensible (meaningful) structure, and that verbal meaning is the methodological unit of this study (Hudson et al 1999; p.2)

Nowhere do the authors explain what is meant by 'language as correlative of thought' or 'language as correlative of consciousness' or 'meaning' or 'sense'. To have to look

up Kozulin reflects the inadequacy of the statement, given that this statement forms an essential part in the explanation of the paper's 'theoretical framework'.

But where does all the gobbledegook come from? This gobbledegook, we would argue, is a legacy of the mathematics education reform of the 1950's/60's. This was a period of alliances and compromises between university applied mathematicians and industrialists, pure mathematicians and Piagetian activists, together with HMI's and other representatives of the State, to define for the teaching profession a mathematics curricula comprising of 'practical maths' and 'modern maths' with a 'discovery learning' pedagogy (Cooper 1982). With reference to the perceived 'crisis' in mathematics education and the 'national interest' (see Cooper 1982), many (but not all) of the key players acted out of vested interests legitimised by spurious educational considerations: no one ever, it seems, stopped to think how it was possible for children to 'discover' concepts that took the best minds hundreds of years to develop. But then, thinking critically like this would not have helped the mission of the reform. By currying favour with the modern algebraist, even Piaget was not immune to being swept away in the ideology of the reform:

> We believe, on the contrary, that there exists, as a function of the development of intelligence as a whole, a spontaneous and gradual construction of elementary logico-mathematical structures and that these 'natural' ('natural' in the way one speaks of the 'natural' numbers) structures are much closer to those being used in 'modern' mathematics than to those being used in traditional mathematics. (Piaget 1973; p.79)

The ancients would have been better off developing modern mathematics given that this would have been closer to their logico-mathematical structures! Despite Piaget's valuable epistemological contributions, this is an example of gobbledegook and the state (including all political parties) played its fair part in contributing to it. Cockcroft and Land (1963), for example, with reference to modern maths and 'discovery methods', shows the extent to which the state (Institute of Education, Ministry of Education) fully supported this gobbledegook. Because of this legacy, the Progressive Education tradition is constructivist and the Plowden Report is the embodiment of constructivist school organisation (Hawkins 1994).

Although the excesses of modern maths have been stripped away and 'discovery learning' can sit comfortably with statement 243 of the Cockcroft report, nonetheless the Cockcroft report and the National Curriculum is a legacy of the gobbledegook of that reform. The CSMS study with its hierarchies in mathematics ('unified structure') and Piagetian assumptions, is a legacy of the 1950's/60's reform and heavily influenced the Cockcroft report (Noss et al 1989) and the National Curriculum (O'Reilly 1990). The National Curriculum is a rigid and legal structure that assumes the gobbledegook that went before but imposes the double-bind of having to act according to the interests of the NC: if you act according to the educational interests of the child then you may find yourself imprisoned!

The National Curriculum, a legacy of gobbledegook, is a statute requirement and so, as far as the state is concerned, does not require gobbledegook to justify and

sustain it! According to Hammersley, instrumentalism is not only greatly valued by the present government, it is also their game and they are ahead of it (e.g. 'policy science'). In other words, the state has switched from gobbledegook to instrumentalism - but then, why continue the gobbledegook when you have a rigid legal structure in place. That structure may require a consensus or may require the enforcement of the law, but it does not require gobbledegook *and hence the switch* – especially since the gobbledegook card might just swing a public consensus for State intervention. Now the structure is in place, instrumentalism is the order of the day as far as the government is concerned because

> Instrumentalism also leads researchers to overclaim in their conclusions. This may take the form of asserting the validity of their findings with more certainty than they should. It may also involve going beyond reasonable conclusions to make all sorts of further speculative claims, both factual and value-laden, yet without making the speculative character of these explicit (Hammersley 1999).

You don't need philosophical and theoretical considerations if the whole aim of the research is to prove that government policy is the correct policy (with all the implications concerning method that that might entail) – but this is what the government has in mind:

> Mr Blunkett castigates researchers for a tendency 'to address issues other than those directly relevant to the political and policy debate' as if politicians were the only conceivable source of important research topics.....he betrays a lack of understanding of Popperian falsification and a curious assumption that research should follow policy instead of preceding it (THES Editorial, Feb.4, 2000; 1421).

Of course, the question and the right answer would seem to be 'obvious': what should the taxpayer pay for, education researchers researching how to 'raise standards' (within the NC?), or writing gobbledegook? Education research may have 'tendencies' but it does not have a *research programme* as such. Unlike the natural sciences, it does not have any paradigm that directs the puzzle solving activities involved in its development (see Chalmers 1982). Although a paradigm may be possible, the lack of a paradigm means that education research is prone to gobbledegook and the quality of the research is *strictly* determined by journal referees (unlike mathematics in which the validity of a theorem, for example, must also play a part). It is therefore reasonable to question, at any time, the quality of the peer review process and there is undoubtedly, for many, a sense in which rejection or acceptance depends not so much the scholarly quality of the article but whether it strikes a chord with the referee's welstuung. One can write a scholarly paper on Vygotsky, for example, but its chances for publication depend on whether it agrees with conventional wisdom. Tooley's report on educational research picks up on this point when he 'questions whether the system of academic peer review, intended to safeguard quality in research, is working properly' (OFSTED 1998). Tooley may be absolutely right and it would be of little use becoming defensive by claiming that British educational research ranks amongst the best in the world – so far, 5000 education research articles on constructivism have been published world-wide

(Matthews 1998a), much of which contains gobbledegook! Tooley, however, is not so much concerned with quality of scholarship but more with 'relevance' and the 'focus' of the research. The question of quality is quite simply ammunition for the instrumentalism of the government. One only has to read the DfEE (1998) Research Report No 74 to get a taste of what this is all about: 'The definition that underpinned this study identified education research as that which ''critically informs education judgements and decisions in order to improve educational action'' ' and that the strategy behind the recommendations is aimed at 'improving the capacity of research to provide support to policy-makers and education practitioners, through improving quality'. Improving quality seems to suggest removing the gobbledegook, yet we find that within the conclusions of the study 'the [present] research agenda tends to be backward rather than forward looking – following policy not prompting it'.

On the one hand, critically informing education judgement implies that judgement is prior to informing - yet on the other hand, research following policy is what has been criticised! The DfEE seem confused as to the distinction between research informing policy and research supporting policy. If gobbledegook is to be discouraged and the quality of research is to be raised, then the DfEE has to set the standard. Judging by its publications for Maths Year 2000 (e.g. 'Maths Matters'), the DfEE appears to be unaware of any possible 'standards' ('Maths Matters' provides a convincing case for why mathematics does not matter. For example, maths is not required to 'help you space out the candles' on a cake and in what possible sense does nature use maths 'to help her build'? Perhaps we can ask a tree – after all, if a tree is mathematically literate then communication is possible!).

Since the Education Reform Act of 1986, mathematics education in England and Wales has been dominated by 'politicians and small-minded bureacrats' (Gardiner 1995; p.335). If we are not careful, then the same people will also dominate education research. The state is in no position to criticise the gobbledegook, but then standards are not *really* the issue here. The state merely wants to impose its own research agenda and gobbledegook will provide the perfect excuse. If education research is to maintain autonomy then the standard must be raised!

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