

# Getting behind the curriculum: Teachers as curriculum developers

---

Andy Begg

*“In recent years in New Zealand there has been a flurry of curriculum activity. Rather than being the result of rational ongoing educational review, the latest curriculum activity has stemmed from political directives...”*

As a former Department of Education curriculum officer, and more recently as a marginal participant in the mathematics curriculum initiative, I am concerned that the latest approach to curriculum development in New Zealand contains many hidden assumptions that are not necessarily educationally sound. I therefore wish to accept the challenge of Biddulph and Biddulph (1997) to contribute to the critical analysis of curriculum in this country.

## The concept of curriculum

For many years curriculum in New Zealand has been thought of as a product, that is, an official document containing what you are supposed to teach. Actually, the official curriculum is not necessarily one document. For example, the current mathematics curriculum documents include *Mathematics in the New Zealand Curriculum* (Ministry of education, 1992), *The New Zealand Curriculum Framework* (Ministry of Education, 1993), *Pangarau* (Ministry of Education, 1994), various teacher guides and a folder on unit standards. These are intended for use not only by teachers but also by the Qualifications Authority, the Education Review Office, and resource developers. Unfortunately, as I explain later, the documents are not all based on the same assumptions and consequently convey somewhat different messages.

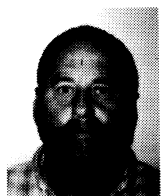
This traditional product view of curriculum is a very restricted one. In my days as a curriculum officer we accepted that the curriculum

comprised all planned activity for learners in a school. Since then I have realised that it is multi-dimensional. In addition to the official national curriculum documents (including associated regulations), there are the

- ideal curriculum, that is, learning experiences that could be provided to students with ideal funding and in ideal circumstances,
- local school curriculum, that is, school and departmental schemes, assessment policies and so forth, teachers' intended curriculum - as evidenced in their units of work,
- taught curriculum, that is, the curriculum as enacted by teachers in their classrooms,
- assessed curriculum, namely the curriculum highlighted or emphasised by the forms of assessment adopted,
- received or learnt curriculum, that is, the curriculum constructed by the learners from their experiences of the other curricula.

As well as these dimensions, there are other less obvious facets to curriculum that are nevertheless very real for students (and teachers). These include the

- hidden curriculum, or the curriculum experienced by students through interaction with their teacher; for instance students may learn from such interaction that they are hopeless at mathematics, or that mathematics is a subject mainly for boys,
- peer curriculum, which can have a very powerful influence on learning and student well-being,



*Andy Begg works at the Centre for Mathematics, Science and Technology Education, University of Waikato. He is particularly interested in curriculum development in mathematics education and has researched international curriculum comparisons.*

- home curriculum, and out-of-school curriculum.

Given these various dimensions to curriculum, it is naive to conceive of curriculum as product. Rather, it is more useful to view Curriculum as a dynamic process of interacting (and sometimes competing) intentions and features.

### The curriculum process

One of the first things to consider with respect to curriculum process, is the purpose of the curriculum. This, of course, is bound up with the purposes or aims of education held by a society for its learners. If we can be clear about the aims then we can think about ways of achieving them (the curriculum process).

A problem with this line of thinking is that, given the multicultural nature of our society, an agreed purpose or set of aims for education is not easy to come by. The Currie Commission (Currie, 1962, p.18), for instance, wrote about the difficulty of the determining the general will of New Zealand society. My personal favourite set of educational aims is that expressed in "Education in Change", a report initiated by the profession (NZ Post-Primary Teachers Association, 1969). The report was clear that,

*the highest value is placed on:*  
 - the urge to enquire  
 - a concern for others, and  
 - the desire for self-respect.

Today, in lieu of an agreed statement of aims, we have both an imposed set and a hidden set. The imposed set is contained in the Curriculum Framework document (Ministry of Education, 1993, p.3) and includes the idea of enabling learners to

- study in essential learning areas,
- develop essential skills,
- continue learning throughout life, and
- participate effectively and productively in New Zealand's democratic society, and in a competitive world.

It is not exactly an inspiring set of educational aims, is somewhat superficial and mechanistic with

*"...it is more useful to view Curriculum as a dynamic process of interacting (and sometimes competing) intentions and features."*

regard to essential skills, and may be a mere form of words since there is evidence to suggest that an effect of New Right reforms is a dismantling of democratic principles in our society.

These rather superficial imposed aims are supported by another set of less visible educational aims which can be gleaned from the language and actions of government ministers and functionaries, of powerful business interests, and of education bureaucrats. These more hidden educational aims seem to include

- gaining unquestioning acceptance for the market model as the way in which our society should operate (through educational management by objectives (Gjone, 1996) following the business model of inputs, outputs and clients, and through privatising educational institutions and operations as much as possible), which in practice amounts to preserving the privileged position of an elite minority,
- fostering the views that knowledge is hierarchical and has to be broken down into little subject bits to be learnt, and that more assessment means more learning,
- the deprofessionalisation of teachers,
- promotion of central control as the right way,
- educational management by objectives.

These various aims are reflected in the process of curriculum development. Curriculum development in New Zealand has always followed a centre-periphery model, that is, the curriculum is developed by a central agency (Department/Ministry of Education) and then disseminated to schools to implement. Until the curriculum 're-

forms' of the last 10 years or so, the process followed by the central agency was largely guided by the RDD approach (Research, Development and Dissemination) - although I believe that it was really an rDD approach because the research component was often minimal. In this approach, a small group headed by a curriculum officer took an unhurried approach to consider academic research, teachers' informal research, overseas developments and political influences, then developed a new curriculum which was subsequently disseminated. The dissemination phase meant that it was sent out to schools and implemented by teachers. In my experience, the dictionary definition of disseminate (scatter about, sow in various places) possibly better describes the actual process. To try to improve implementation teacher release time, funded teacher refresher courses, and new resources or teachers' guides were sometimes provided.

Following the 1989 Department/Ministry of Education restructuring, curriculum development became little more than curriculum writing. A particular concern with this latest change in process is that the person leading the curriculum project is given no time to prepare. Time is not provided to read critically about curriculum, research, or what is happening in a range of overseas countries. Furthermore, the curriculum writers have usually had to work within a politically prescribed framework. Curriculum developers have been reduced to curriculum technologists within this latest version of the centre-periphery model.

### The case of the New Zealand mathematics curriculum

*Mathematics in the New Zealand Curriculum* (Ministry of Education, 1992) was the first curriculum document written under the restructured Ministry. It was produced within a very tight time line set by the Ministry, and even preceded *The New Zealand Curriculum Frame-*

*“These examples indicate that there are clearly other ways of viewing a mathematics curriculum.”*

work (Ministry of Education, 1993). Teachers, as a professional group, had no input into the document as of right. As explained above the official mathematics curriculum comprises several curriculum documents.

The main document is quite lengthy (216 pages) and uses the controversial ‘achievement levels’ for organisational purposes, as required by the then Minister of Education, Lockwood Smith. These imply a hierarchy of knowledge, but are not based on research. They were simply copied from England. Through means of assessment the Minister thought that the use of levels in the curriculum document would improve ‘standards’ in mathematics learning.

It is interesting to note that *The New Zealand Curriculum Framework* (p.11) claims that mathematics occurs in many school subjects such as science, graphics and design, home economics, workshop technology, economics, history, geography and accounting, and that these subjects contribute to students’ mathematical development. In contrast, the mathematics curriculum document neither acknowledges the contribution of other subjects, nor shows how mathematics might contribute to the other learning areas. In short, the mathematics document leaves the impression that mathematics is a subject divorced from other areas of knowledge.

Teachers were the eventual recipients of this document. Some received brief professional development opportunities, provided under contract by facilitators, to help them implement the new curriculum. For many of the teachers who participated the opportunities were far too short to effect the fundamental changes in their mathematics teaching which the new curriculum

implied. As discussed below, a curriculum process which relegates teachers to the technical implementors of a new curriculum document seems seriously flawed.

### **Some comparative curriculum data**

Considering the mathematics curricula of others countries can be quite revealing. It can highlight aspects of our own curriculum that we take for granted, but which perhaps we should not necessarily accept as given. For instance, Australia and the United States have produced national curriculum documents similar in size to our own but they are not binding on the various states, whereas United Kingdom (except Scotland) state schools have had a national document imposed on them in the way we have. This has also been the case in Norway and Sweden but their curriculum mathematics documents were only about 20 pages in length. The mathematics curriculum in the Netherlands is more detailed but is completely optional. In the Czech Republic the curriculum and syllabuses are approved by the Ministry of Education but allow from 10% to 40% variation with elective subjects determined by the principal and head of subject (Kotasek and Svecova, 1995). I asked mathematics curriculum officers in both Norway and Sweden about the slimness of their documents and whether they provided sufficient guidance to their teachers. The response in both countries was the same; they said, “Our teachers are professionals” and “Our countries are democracies.”

In the senior secondary school, leaving examinations and awards can exert considerable influence on the curriculum. It is therefore interesting to see that in Sweden there is no major examination in the final year of schooling, and in Holland the examination is used to provide guidance, not exclude students from further study.

These examples indicate that there are clearly other ways of viewing a mathematics curriculum.

And they give extra cause for thought when we realise that children (equivalent to our S3 and F2) in the Czech Republic and Netherlands performed in the top half-dozen countries in the world on the recent Third International Mathematics survey.

### **Alternative approaches to curriculum development**

There are alternative ways of thinking about curriculum and developing a mathematics curriculum. For example, Ralston (1994) has proposed the notion of a ‘zero-based curriculum’ where the existing curriculum is put aside and planning begins with a clean slate. This may be useful for teasing out future trends but in my view it is almost impossible to ignore the past, and in any case we need to acknowledge where we are coming from. Another proposal is Firsov’s (1996) two-level curriculum in which the top level is the one that learning tasks are aimed at while the lower is the more basic level used for assessment purposes. It is based on Firsov’s belief that virtually all students should be able to achieve with assessment tasks and the observation that we hardly ever know a subject well until some time after we first meet it. I mention these views of curriculum to show that other ways are possible. In the remainder of this paper, however, I would like to outline an approach that accords teachers a central role in the curriculum development process.

Since curriculum is process, it follows that teachers are inevitably key players in the process because both the national and local curricula are mediated through them in the classroom. While it may be the case that the level of mathematics required by the general population is decreasing (Keitel, 1995), it is also true that mathematics is now seen in an entirely different way from that which most of us gained from our schooling. The Teaching Committee (1995, p.6) expressed this well. “Mathematics is far more than a collection of knowledge and skills; it is a way of looking at the

*“Since curriculum is process, it follows that teachers are inevitably key players in the process because both the national and local curricula are mediated through them in the classroom.”*

*“The development of the ‘Realistic Mathematics Education’ curriculum in the Netherlands is an excellent example of how teachers can be involved in the curriculum development process.”*

world.” This perspective cannot be foisted on teachers; it is not something you read about in a document and simply implement. It requires a radical change in thinking about the nature of mathematics and prolonged efforts to turn this into both appropriate classroom learning tasks and interaction with students. Such change, such professional development, takes considerable time and support, and is best facilitated through teacher involvement in the curriculum development process.

The development of the ‘Realistic Mathematics Education’ curriculum in the Netherlands is an excellent example of how teachers can be involved in the curriculum development process. Teachers were treated as knowledgeable professionals, consulted from the beginning, undertook trials of new approaches and materials (including new forms of assessment), provided feedback to the curriculum developers, and had largely taken ownership of the new curriculum during its years of development by the time it was accepted as a national document. Little wonder that in the Netherlands the mathematics curriculum document is not legally enforced.

The approach that I have in mind would be characterised by a number of important principles:

- It would be evolutionary in the sense that it would involve continuous reflection, critique and development by teachers and others, instead of such people merely reacting during a round of curriculum writing or accepting without question what may be handed down to them.
- It would seek to hear the voices

of a range of relevant people such as teachers, practitioners (that is, mathematicians and statisticians), academics (and their research), members of the community, employers, and educators (teacher educators, curriculum developers), rather than using language that excluded many of these groups.

- Such consultation would be likely to result in multiple viewpoints which could be accommodated in a curriculum document that provided an overall sense of direction rather than one that tried to list specific requirements.
- Assumptions made with respect to the development of a new curriculum should be made explicit, for example, assumptions about the purpose of education and curriculum, the nature of learning, the point of assessment, and the (professional) place of teachers in the process.
- Exploratory classroom studies would be undertaken and evaluated before new ideas were included in a national curriculum.
- The curriculum development process should be freed from direct political control by becoming the responsibility of a non-political Curriculum Council or Board of Studies.

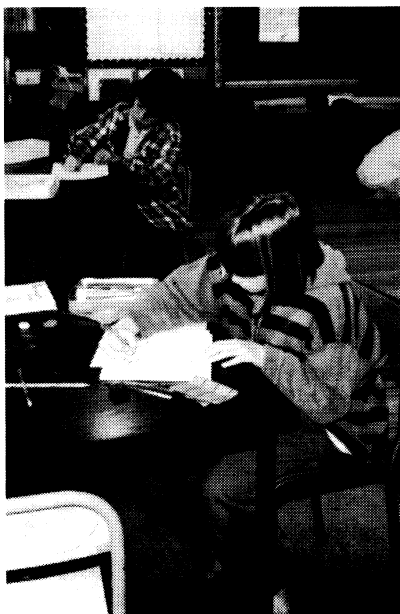
### **Conclusion**

My view of curriculum as process contains a number of implications. These include:

- Curriculum development becomes a dynamic process keeping pace with changes in



*“The curriculum development process should be freed from direct political control by becoming the responsibility of a non-political Curriculum Council or Board of Studies.”*



- society and research findings, and is far more integrated with teacher professional development than anything we have known in New Zealand to date.
- There is a need to value teacher growth as a continuous process. Teachers are the critical people in curriculum development.
  - The whole question of assessment needs to be considered in depth as part of the curriculum develop process. The assumption that people might learn more if they are assessed more, for instance, seems senseless.
  - It is desirable to have a curriculum framework supported by ‘connected’ but **minimal** subject/learning area documents - but these need not be compulsory.
  - If more direction is needed then teacher guides should be produced, but these will only be needed while teachers recover their professionalism.

I am hoping that the debate contained in this paper will contribute to a sounder approach in the next round of national curriculum review.

### Acknowledgement

I wish to acknowledge the assistance of two colleagues, Bronwen Cowie of the University of Waikato and Glynn Lorrigan of the Auckland College of Education, for helpful comments on an earlier version of this paper which was presented at a seminar on “Implementing the Curriculum” at the Principal’s Centre, Auckland University, October 1996.

### References

Biddulph, F. and Biddulph, J. (1997) The need for ongoing critique of curriculum.

Editorial in *Teachers and Curriculum*, Vol.1.

Currie, G.A. (Chair) (1962) *Report of the Commission on Education in New Zealand* (Currie Report). Wellington: Government Printer.

Firsov, V. (1996) Russian standards: Concepts and decisions. Paper presented at the 8th International Congress on Mathematical Education (To be published in the Conference Proceedings).

Gjone, G. (1996) A new role for curriculum documents - from inspiration to production plans? Paper presented at the 8th International Congress on Mathematical Education (To be published in the Conference Proceedings).

Keitel, C. (1995) Seminar at the Mathematics Education Unit, University of Auckland.

Kotasek, J. and Svecova, J. (1995) Czech Republic. In T. N. Postlethwaite (ed) (1995) *International Encyclopaedia of National Systems of Education* (2nd edition). Oxford: Pergamon/Elsevier Science Ltd. 257-265.

Ministry of Education (1992) *Mathematics in the New Zealand Curriculum*. Wellington: Learning Media.

Ministry of Education (1993) *The New Zealand Curriculum Framework*. Wellington: Learning Media.

Ministry of Education (1994) *Pangarau: Te Tauaki Marautanga (He Tauira)*. Wellington: Learning Media.

New Zealand Post-Primary Teachers’ Association (1969) *Education in Change*. Auckland: Longman Paul.

Ralston, A. (1994) A zero-based curriculum. *ICMI Bulletin 36* (reprinted in *ICMI (NZ)/10*).

Teaching Committee (Subcommittee) (1995) *Why? What? How? Some basic questions for mathematics teaching*. Leicester: The Mathematical Association.



*Dr Andy Begg is a Senior Lecturer in mathematics education. He has a special interest, and is currently conducting research, in mathematics curriculum development in New Zealand. He would like to hear from teachers about their views and experiences of mathematics curriculum development. He may be contacted at the Centre for Science, Mathematics and Technology Education Research, University of Waikato, P.B. 3105, Hamilton, or on email at: a.begg@waikato.ac.nz*

