MINISTRY OF EDUCATION

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New Zealand Stocktake: an international critique

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Contents

Note

In Australia, Canada, Germany, Spain, Switzerland and the USA responsibility for some aspects of education are devolved to sub-national level (state, province, *Land*, autonomous community, canton) and generalisations cannot be made. In the interests of brevity, it may be that some references relate to the situation in one or more state or province.

Acknowledgements

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1. INTRODUCTION

1.1 Purpose and Structure of Commentary

The purpose of the commentary is:

`*to provide constructive critique on the New Zealand Curriculum Framework, and the seven national curriculum Statements with regards to:*

- *their educational integrity*
- *their potential for supporting effective educational practice*
- *the standing of the New Zealand curriculum in relation to international views of effective curriculum Statements.*

The focus of the report is on the curriculum as specified (the intended and regulated curriculum) rather than the curriculum as implemented.'

The eight documents referred to above, in combination with National Education Guidelines and National Administrative Guidelines, outline the intended and regulated curriculum. The

curriculum as *intended* may be transformed as it passes through the phases of regulation (the *planned* curriculum), interpretation, reformulation and presentation by teachers (the *taught* curriculum), reception by students (the *experienced* curriculum) and the interpretation and internalisation by students (the *learned*, or *internalised* curriculum) (Harland, 1988). One may add the *hidden* curriculum, incorporating the school ethos and out-of-class activities, and the behaviour models of this within it, and the *assessed* curriculum (Begg, 1994). The influence of assessment, especially where it is high-stakes, can unintentionally limit the taught and learned curriculum.

Whilst these dimensions interact, this critique focuses on curriculum intentions, as expressed in the eight policy documents. The guiding principle of the commentary is that there is no `best' curriculum, but rather a `best fit' according to a country's political, cultural, social and economic context. For example, the bicultural heritage in New Zealand is reflected in the curriculum in an exceptional way. This unique position does not mean that New Zealand's approach has less merit or worth for the country or its people.

Section 2 draws on Piper's (1997) curriculum models[1] to explore the principal functions outlined in, or inferred from, the eight New Zealand Curriculum documents, and identifies the issues which arise, in terms of fulfilling the associated functions.

Section 3 analyses the internal coherence between the overall principles and intentions, as expressed in the New Zealand Curriculum Framework, and their enactment in the individual curriculum Statements.

The curriculum (in New Zealand or elsewhere), in itself, cannot secure effective practice, although it can support, stimulate, or conversely inhibit it. The implications of the curriculum formulation and pedagogy are explored in Sections 4 and 5.

Section 6 examines some elements of implementation which emerge from the preceding analysis and Section 7 proposes recommendations which, in the judgement of the commentator, will contribute to the coherence of the curriculum documents and facilitate the implementation of its intentions by teachers.

1.2 Perspective

Given the individual differences within countries (even within families) and over time, this critique is based on the view that there is no one right answer and the `effectiveness' of a curriculum depends on the extent to which it meets the stated educational aims for defined groups of students, in ways that are consistent with the values and/or rationale, which are manageable within the available human and other resources, and which take into consideration potential unintended outcomes and opportunity cost. `Successful curricula' are those which allow flexibility and promote development whilst safeguarding minimum entitlement, and are evaluated in terms of their intended and unintended consequences and their (continuing) appropriateness in changing circumstances.

1.3 Sources

In January 2000, the Ministry of Education undertook a review of published critiques and commentary on the New Zealand curriculum[2]. New Zealand and overseas sources were sought, with a date range of ten years. The interim report states that, of the 125 sources identified,

[the] majority of critiques come from a small number of parties. These are:

The Education Forum which is the most prolific, and has written or contracted critiques of each of the individual curriculum Statements and on some more general matters. The Forum is unique in having access to a fully funded, full time analyst with resources to commission

selected academics from both New Zealand and overseas to develop its reports and to have them published, circulated and publicised.

University education departments, although less has been unearthed in this search than has probably been published under the heading of curriculum per se. There is published research on learning and teaching in New Zealand which may offer valuable insights in relation to curriculum, and a broader search will be needed to uncover these works.

The Education Review Office, which regularly publishes reports on aspects of the curriculum and of school life from information gained during school reviews within a certain period. These often touch, directly or indirectly, on the curriculum documents themselves. (New Zealand Ministry of Education, 2000, page 2.)

Searches of the English language literature have revealed little in the way of commentary on the New Zealand curriculum originating from outside New Zealand and Australia.

The consultation exercise conducted by the Ministry of Education on drafts of the curriculum framework and the curriculum documents attracted responses mainly from teacher associations, teacher educators and other community groups. In terms of quantity, the most significant response came from the Education Forum, which was critical of the proposed curriculum and, indeed, of the Government's role in education in general. It has not been possible for the Ministry to determine the extent to which the views expressed are representative of those held by stakeholders as a whole.

It is understood that the limited number of responses from practising teachers may be due to a range of factors, including:

- the involvement of teachers in the writing of curriculum Statements, thereby incorporating practitioner views at an early stage
- a deterioration in the relationship between the secondary sector and government and central agencies from 1990 onwards, and
- a commonly expressed perception that teachers' comments would not have any significant impact on the proposed policy.[3]

However, the New Zealand Educational Institute raised to concerns of teachers, collectively, in its response to the draft *New Zealand Curriculum* discussion document of 1991. When these concerns are compared with the final versions of the documents, there is evidence that these views have been taken into consideration by the Minister and the Ministry in drafting the final version.

Other critiques[4] expressed reservations about, or criticism of, the proposals. The experience of the consultation exercise suggests that those who are satisfied with the proposals may feel no need to endorse what `will happen anyway', whilst, conversely, for some of those who are dissatisfied, this perceived inevitability discourages them from spending time and effort on a futile exercise. As with the responses to the consultation exercise, it is not possible to assess the extent to which these views are representative, in the absence of more systematic surveying/sampling. It is understood that this research has been instigated in late 2001.[5]

It is not the role of the present commentary to endorse or refute individual critiques, but rather to use the issues and concerns raised, by theme, as a contribution to the evaluation of the curriculum's purpose, its integrity and its feasibility.

2. PURPOSE AND FUNCTION OF CURRICULA

In simplified form, the challenge facing education systems is to create, in conjunction with families and other agencies, a `better' future for individuals and society. The definition of

`better', and the priority given to elements that contribute to its achievement, may be explicitly stated in, or inferred from, curriculum and policy Statements.

This section adapts Piper's (1997) framework to examine different curriculum positions or models with particular reference to their functions. They have been grouped into six groups: accreditation, accountability, excellence, teleological/instrumental (utilitarian, economic, functional), social cohesion (political and cultural) and social engineering. Whilst each model has its supporters, some are mutually incompatible, at least where resources are limited. Educational `consumers' (students, parents, teachers, trade unions and employers, society at large, the local community, and social, religious, political and other interest groups) have their own, sometimes competing, views on what should be taught in schools. In a democratic society, all these groups want their views to be taken into consideration. Governments adopt curricula (after lengthy discussion) `*because a transparent education system, with a comparable standard in all schools, is part of their central responsibility*' (Standaert, 2001, page 191).

This section outlines ways in which each of the models is reflected in the New Zealand curriculum documents. The issues raised are those which emerge from the curriculum models and their implementation generally; they do not relate specifically to New Zealand's interpretation and application of the models. Nor is it assumed that any under-representation in the New Zealand curriculum is necessarily a weakness, as this may be due to a deliberate choice, reflecting the principles and priorities which are addressed in Section 3.

2.1 Accreditation

Education systems, schools and students are under increasing pressure to demonstrate what they have achieved, particularly during the period of compulsory education. In recent decades, many countries have moved from an input-based to an outcomes-based model[6], leaving decisions on process largely to teachers. This approach has been adopted, among others, in the Australia, Canada, the Netherlands, UK[7] and the USA. Regular student assessment has become an important means of monitoring the performance of the education system and of highlighting the relative performance of schools. Critics of this approach argue that it is based on an unjustified assumption that all learning can be measured and graded[8] and that outcomes-based systems undervalue, and therefore undermine, learning which cannot readily be measured.

A second function of `credentialist' curricula is to recognise and accredit (summative) achievement and to provide motivation and guidance for further learning. Achievement objectives provide a basis for discussing and demonstrating student progression. For better students, this may provide extrinsic motivation, but weaker students may be demotivated by the `evidence' of how they are lagging behind their peers, especially as students are grouped by age and levels are associated with Years.

As compulsory education was extended, qualifications, previously reserved for the élite, were expanded and reformed to recognise the achievements of a wider range of students. Some countries have developed qualification frameworks, whereby recognition is given for units of learning (credits) which may be accumulated for the award of a diploma or similar qualification. In line with these developments, and the growing occupational mobility within Europe and elsewhere, student performance is compared against identified criteria (criterion-referenced) rather than with that of other students (norm-referenced).

New Zealand

The New Zealand curriculum, with Achievement Objectives (AO) at eight levels, is intended to allow all forms of learning to be accredited in a `transparent' way. In this sense, it addresses the function of the credentialist system. However, the extent to which the New Zealand curriculum, as outlined in the Statements, enables teachers to provide comparable evidence of student achievements is limited by:

- the formulation of Achievement Objectives, which are not expressed in terms of *measurable* outcomes
- the reliance on teachers to translate Achievement Objectives into learning outcomes, and
- the reliance on non-standardised, school-based assessment, until the upper secondary stage of secondary education (*see 3.4).*

ISSUES

Does a credentialist curriculum model focus on the instrumental rather than intrinsic benefits of learning, thereby undermining the development of a disposition for lifelong learning?

Do qualification frameworks promote `qualification overload' without a corresponding increase in `purchasing power'?

Do academic and vocational qualifications enjoy parity of esteem?

2.2 Accountability

Almost everywhere, the issue of `quality' is linked with the search for a new balance between governmental regulatory measures and school self-regulatory processes. There is a growing conviction that quality development should be linked to school autonomy, independence and deregulation. A two-way trend in terms of central control of the curriculum (at national or sub-national level) can be identified. Previously `centralised' curricula, often reinforced by prescribed textbooks, (e.g. France, Italy, Japan, Korea, Singapore, Spain) are being deregulated, and elsewhere, `curricular suggestions' are being tightened with the introduction of compulsory core objectives and/or programmes. This particularly applies to countries which, having devolved financial and the management responsibility to individual schools[9], seek to safeguard student entitlement and their ability to move between schools[10] on the one hand, and to hold schools to account, on the other (e.g. Australia, Canada, England, the Netherlands). Centralised control, especially in the latter group, is reinforced by student assessment at key stages in their learning[11] and the collection and publication (in some cases) of results[12].

The recent PISA results[13] suggest that there is no significant correlation between centralised curricula and high student performance in reading, mathematical and scientific literacy. Indeed, a perception that centralised curricula might prevent schools from meeting the needs of individual students has led to reduced prescription, for example, in England, the Netherlands, Singapore and Spain[14]. In most cases it was the performance of less academic students which stimulated action; it is concern about the effect of a centralised curriculum on the achievements of more able students which has led the Blair administration (England) to propose legislation that would allow `good' schools[15] to exercise even greater discretion over the curriculum.

New Zealand

New Zealand has chosen not to implement systematic student assessment at key transition points. Nevertheless, the Statements and the expectations of the Education Review Office, have caused some teachers to interpret the Achievement Objectives in terms of areas to be `covered' rather than as a framework for managing and discussing learning. School inspection and the publication of reports, for example in England, have had a similar effect.

ISSUES

Does an outcomes based curriculum raise expectations and achievement simply by being more explicit about what could/should be achieved? Or does it risk the opposite effect, if the

degree of stretch/challenge from (perceived) current situation is too great for teacher and/or for students?

Does an `outcomes led' curriculum inevitably lead to the subsequent introduction of high-stakes assessment, thereby shifting further towards a tool for accountability rather than for planning learning?

2.3 Excellence

The classical humanist tradition centred on broad learning areas, aiming to develop a well-rounded individual. The curriculum of early public sector secondary schools prepared the élite for university entrance. When secondary education became universal, a more instrumental approach was adopted, giving rise to selective school systems which channelled young people into different learning pathways (academic, technical, practical) according to their abilities. A change in the predominant political ideology during the 1960s and 1970s caused selective schools to be progressively phased out[16] and resources to be allocated to `compensatory' education within a framework of heterogeneous schooling.

However, selection continues to be a characteristic of secondary education in Germany, Northern Ireland, Switzerland and, to a lesser extent, England and the Netherlands[17]. Within heterogeneous schools, `tracking' or `streaming' allows individual students to study more efficiently, at their own pace and to develop their full potential for their own and their community's benefit. The most able are prepared for higher education and allow weaker students to take the time necessary to achieve higher qualifications[18] than they might do if they were expected to maintain the rate of their more academic peers. More recently, the special education of gifted and talented students is once again recognised as legitimate.[19]

There is considerable concern about the difference in performance between the most and least able *(see 2.6 below).* One initiative, intended to meet the preferences and learning styles of a wide range of students is the establishment of specialist schools. Whilst continuing to offer the `normal' curriculum, these schools feature, for example, Science and Technology, music, foreign languages, the Arts, or sports.[20]. They may select at least some of their students according to their aptitude in specific areas[21], which, in the eyes of critics, is simply selection by another name. Moreover, the location of such schools means that not all students have an equal opportunity to be admitted.

The PISA survey[22] found that élitist systems that segregate (secondary) students into different types of school have a greater degree of variation between the best- and worst-performing students (e.g. Germany 113 points and Switzerland 115 points, as compared with only 33 points in Korea). It is not clear whether, and to what extent, the relatively smaller degree of variation in the Netherlands (71 points) is due to recent institutional and curricular reforms and the introduction of a common curriculum for the first three years of secondary education. The PISA report therefore suggests that heterogeneous school organisation can overcome some of the effects of family background on student performance.

New Zealand

The New Zealand curriculum aims to offer opportunities for all students, irrespective of ability, to prepare for post-compulsory education, employment and lifelong learning, within a non-selective school system. (*See also 3.8 below*)

Critics argue that the breadth of the curriculum has reduced the time available in Years 9 and 10 to prepare for examinations in Years 11 and 13. Yet others point to the significant discrepancy between the achievements of the best and worst performing students, with the distinction largely following socio-economic and ethnic lines. This `long tail' phenomenon is shared, for example, by Australia, UK, Germany, Hungary and Switzerland.[23]

ISSUES

Does a `minimum standards for all' curriculum restrict the pursuit of excellence, in that common curricula may limit the opportunities (given and taken) to develop the gifted and talented on the one hand, and those with learning difficulties on the other?

2.4 Teleological/instrumental

Piper's utilitarian, functional and economic models are grouped together under the heading `teleological'[24] because their main function is to prepare young people to function as productive members of society and the curricular approaches to, and issues arising from, the maintenance and development of basic, occupational and life skills overlap.

2.4.1 Utilitarian

The introduction of a centralised/common curriculum has not, of itself, increased the stress on the basics (that is, literacy and numeracy). In fact, such curricula generally aspire to greater breadth, with increased emphasis on Science, Technology and, to a lesser extent, foreign languages, and more explicit expectations in areas like the visual Arts, music, physical education. This has had a greater impact on primary education, where the curriculum emphasis, beyond literacy and numeracy, was limited by teachers' lack of specialist subject knowledge. Accordingly, the introduction of wider curricula has been accompanied by programmes of staff development, to raise teachers' competence and confidence in the full range of learning areas. The increased breadth has not been universally popular and some argue that the emphasis, in the early primary years at least, should be on mastery of literacy and numeracy. At the secondary phase, the relevance of education to adult and working life became a major focus from the 1980s.[25]

Public awareness of educational outcomes, raised by reports of student performance in national assessment and international surveys[26], has reinforced these views. Despite the problems arising from comparative surveys[27], there is considerable pressure on politicians and educators (to be seen) to address any perceived `poor' performance relative to other countries.[28] This has led to calls for education to go `back to basics', and the breadth built into new curricula has, in some cases, been reduced.[29]

In some countries, the development of `teacher proof' schemes, intended to improve basic skills has had a positive result. However, these may encourage the pursuit short-term outcomes rather than long-term learning (Standaert, 2001). This approach `*reduces the professional status of teachers to that of semi-schooled workers who must occupy themselves with the prosaic duties of maintaining discipline and the preparation of tests*' (Apple, cited by Standaert 2001, page 194).

It could be argued that a high degree of documentary prescription demotivates and deprofessionalises teachers and prevents the organic development of the curriculum in response to changes.[30]

2.4.2 Economic

A growing trend is the focus on the development and assessment of key or essential skills[31] in response to individual learning and economic needs. On the one hand, applied learning is intended to enhance the motivation, and therefore the achievements of less able students. On the other, it is argued that education should address society's need for citizens and workers who are well educated and have `relevant' skills and `appropriate' attitudes.[32] As manufacturing industry has become increasingly mechanised and computerised, the demand is for employees with higher order skills. Many countries have identified creativity and entrepreneurship to be essential for occupational flexibility, lifelong learning and economic competitiveness.

However, the `human capital' view of education, which tends to see education in terms of an economic investment, has provoked criticism (Grace, 1990). First, some skills are ill defined and it may be impossible or premature to comment on the extent to which students have developed them during, or even at the end of, full-time education. Second, given the pace of change in terms of knowledge, technologies and global markets, even the best employment-related, `relevant' learning is likely to lag behind what students encounter on leaving school. Third, critics argue that, by reducing the emphasis on knowledge and understanding, skills-based curricula are excessively instrumental and undermine students' appreciation of the intrinsic benefits of learning, a key motivator for lifelong learning. Finally, pressure on school time is increased by the introduction of, for example, communication and numeracy, alongside the (national) language and mathematics.

2.4.3 Functional

A further dimension concerns the preparation of students for adult life, to fulfil the roles of consumers, personal finance managers, home-makers, parents and so forth. Whilst education in these areas is important, it has traditionally been offered mainly to less able students, and is now often included in non-statutory guidelines. Experience has shown that the (perceived) pressure to teach the statutory elements, and especially those, which are externally assessed, leaves little time for non-compulsory or unassessed aspects.

One exception is the development of information and communications Technology (ICT) skills. Governments in all developed countries are investing in the provision of internet links, hardware, software and materials and staff training[33], to enable schools to develop students' computer literacy, to meet the demands of technological advances and the global economy. Some schools offer specific lessons to develop computer skills[34], but the need for this is expected to diminish as students increasingly have access to computers at home (although access is not equally distributed). The selection, appropriate use and evaluation of different technologies for specific tasks, and wider ethical consideration of the purpose, effectiveness and (un)intended consequences of a range of technologies, are studied in subjects/learning areas (Science, Social Studies and Technology) or as cross-curricular themes or guidelines (for example, environmental education for sustainable development). Expectations are that communication technologies will enable individuals to learn independent of time and location underestimate the role of schools as social agencies. Some aspects are being implemented (for example, the creation of electronic education networks linking schools to each other and to the Internet; the development of digital curriculum materials). However, a transfer from school-based to independent learning, within which teachers would be only one of a range of sources of guidance and mentoring, would require a considerable attitudinal and organisational changes as well as investment in the preparation of materials and teacher professional development. Such a paradigm shift is therefore likely to be some way off.

New Zealand

The New Zealand curriculum identifies eight essential skills, which should be developed through the essential learning areas. These go far beyond narrow, possibly outdated, occupational skills. However, whilst Statements refer to the general contribution of the learning area to the development of the essential skills, suggestions for transfer of learning are inconsistent. For example, whilst the Mathematics Statement devotes attention to problem solving, the other essential skills are relegated to a single paragraph. Science makes links with specific reference to other part of the curriculum and detailed examples of transfer are given in supplementary documents, for example, *Making Better Sense of the Physical World*. The relationship between the learning areas and essential skills should be clearer in the Statements, with the details being included in the guidance documents.

On a broader level, the Statements promote the development of higher order learning skills by recommending a range of teaching approaches (*see 5 below*) to help students progress from knowledge as given to knowledge as problematic. Research suggests that such approaches

help students internalise learning matter and build `scaffolds' for further (independent) learning (Brown, 1975; Wood *et al* 1976; Greenfield, 1984; Berk and Winsler, 1995).

ISSUES

What is the balance between instrumental and developmental education? How does this affect dispositions towards lifelong learning, as distinct from occupational (re)training?

Does a curriculum whose primary focus is on measurable outcomes (implicitly) devalue what cannot be measured, and thereby diminish the attention devoted to these aspects of the curriculum?

How are the higher order skills to be measured?

2.5 Social Cohesion

This section groups together Piper's political and cultural models, whereby schools seek to safeguard and promote social cohesion.

2.5.1 Political

One function of schools is to socialise children, to have them understand, be familiar with, and value the conventional ideas and beliefs of the society of which they are becoming a part. However, formerly powerful central institutions (e.g. the church, polarised political movements) have lost much of their influence on citizens, and negotiated culture replaces family authority (Hooghoff and Bron, 2001). Access to radio and television channels world-wide means that the media no longer offer a shared cultural experience. Societies are increasingly diverse, socially, culturally, ethnically and in terms of religious practices. Individualisation, globalisation and the development of sub-cultures mean that current morality has become fragmented.

As a result of these developments, the acceptance of a common set of values, to underpin the laws and way of life in any given country, can no longer be assumed. It is increasingly necessary to negotiate values, to develop active tolerance for, and manage the potential conflict arising from, diversity. These changes require a new and extended educational focus on democratic participation, developing moral judgement and intercultural understanding (Schirp, 2001)

There is a `*constant tension in schools between teaching the conventions whereby students will have to live and encouraging the capacities that enable them to gain some kind of mental freedom from those conventions - making them tools rather than constraints.*' (Letschert, 2001, page 44). Whilst schools socialise students - directly through teaching and indirectly through the rules and procedures whereby they seek to maintain order - the development of independent moral judgement tends to receive less attention. Letschert offers four reasons: it is hard; we have no clear curriculum guidelines; it clashes with what already takes up so much energy; and the various kinds of regimentation in schools exert subtle but powerful pressures against it.

Traditional political structures are crumbling and there is a worrying reduction in the number of people who vote. Hooghoff and Bron (2001) contend that the political distinctions are less clear, as political parties compete for the middle ground and focus on marginal differences, good management and securing public interest. A relatively low political interest and willingness to participate in civic life are offset by a substantial interest in human rights issues. Trends towards open government and freedom of information, together with electronic access and communication,[35] mean that information is more readily available. Governments collect and publicise data to enable individuals to choose between schools within the `education market place'[36] of public services. The commodification of public services has raised the

expectations of `consumers'. In order to make informed choices, young people need to be able to access and analyse information and evaluate its relevance, accuracy and objectivity. They also need to be able to assess the impact on the wider community of their own, and others' choices.

The evidence at present suggests that, especially in western nations, individualism is running alongside (or, in some cases, supplanting) the sense of community.[37] This is manifested by a `democratic deficit', or disengagement from traditional forms of democratic involvement such as voting and public service. This trend goes against an increasing tendency on the part of governments to involve people in policy making (through consultation) and implementation, for example, by devolving authority to local bodies, such as school governance boards[38]. In contrast, there is an increasing tendency for individuals to seek (judicial and other) redress for perceived deficiencies in public services.[39]

Several nations are seeking to reverse this trend by means of a new emphasis on citizenship education[40], with a view to helping young people to develop a sense of self as a responsible/accountable and empowered individual, within an interdependent community and world.

2.5.2 Cultural

It is argued that the protection and transmission of traditional culture is important to help young people to develop a sense of self arising from a shared history and values, and to strengthen the sense of social cohesion. In some Asian countries, especially where the push towards economic and technological progress has unacceptably `westernised' the nation (e.g. Korea, Singapore, Malaysia) the expressed purposes of school education are explicit in terms of religious higher purpose and the development of a national identity which transcends cultural and ethnic diversity. The approach is also strong in countries emerging from domination (e.g. Hungary).

Global mobility has made concepts of `national' or `traditional' culture problematic and the explicit recognition of multiculturalism is seen as socially and educationally necessary. This may be reflected in curricula in various ways:

- teaching about different cultures
- using a range of cultural contexts in teaching
- promoting positive attitudes towards diversity
- making differentiated provision for different cultural/ethnic groups.

Values, ethics and attitudes are addressed in a range of ways:

- through the school's ethos and rules, and the example set by staff, students and others in the school community
- implicitly or explicitly, in classroom discussions, for example in literature, Science/Technology and Social Studies
- as specific curriculum strands (e.g. environmental education, sustainability, the implications of technological developments)
- in moral or ethics education[41]
- in religious education lessons. Countries where religious education is compulsory in state schools [42] may teach the established religion (e.g. Italy, Spain) or alternatively, incorporate the major religions practised in the local community.[43] Some countries prohibit the teaching of religious education in state schools[44], but many governments allow, and may subsidise, denominational or faith schools[45].

New Zealand

New Zealand does not have a separate subject for citizenship, but in social Sciences `*students will be helped to understand their rights, roles and responsibilities as members of a family and as citizens in a democratic society*' (*New Zealand Curriculum Framework* page 14.) Although religious education is excluded, the New Zealand identifies values and attitudes which `*are supported by most people in most communities*'.

The most dominant feature of the New Zealand curriculum - from the outsider's perspective - is the strong emphasis on recognising and protecting New Zealand's bicultural heritage and the features unique to New Zealand. This commitment is carried through at two levels: system and curriculum. There are Maori-medium and English-medium schools. The curriculum stresses the principles, offers parallel curriculum documents (English-language and *te reo Maori* versions), prescribes `essential learnings' about New Zealand society and the Treaty of Waitangi (in Social Studies), and includes specific examples of Maori culture and heritage in the other learning areas. A corollary of this approach is the relative weakening of the commitment to recognising and drawing on the culture and traditions of the other groups in New Zealand's multi-cultural society.

(*See also 3.9 and 3.10 below*)

ISSUES

How does social and cultural diversity affect the school's role in `preparing young people to participate in democratic and public life'?

What is the school's role in reconciling the values that underpin ethical, political, social and economic choices?

2.6 Social Engineering

Piper describes this category as `ethical', in that it addresses the values of equity, equality and social justice. Its primary function is to secure an `entitlement' to differentiated educational opportunities, which will enable all young people to enhance their social and economic status in society.

One of the effects of universal compulsory education, and the publication of school brochures and results to inform parental choice, is an increasing politicisation of education.[46] Governments are under pressure to `deliver' (the benefits of) high educational achievement to all students, regardless of their abilities, inclinations and commitment. This has resulted in virtually constant policy changes in response to ideology, consumer demand, and the pursuit of `World Class' curricula and qualifications.

During the 1960s-1970s, school organisation, curricula and examinations were reformed to provide equality of access for all. `Compensatory' education was provided for disadvantaged groups, and `handicapped' students were segregated into special schools. During the 1980s and 1990s, categorisation was rejected as being discriminatory and inequitable. Instead, teachers were encouraged and supported to tailor their teaching to meet individual educational needs within the mainstream classroom (inclusion and differentiation). Curricula frequently express inclusiveness principles and suggestions for supporting students with different needs; qualifications frameworks are being developed (for example in Australia, England, Scotland) to allow for the accreditation of modules of formal and informal learning, whether undertaken in school, in the work-place or elsewhere.

Moreover, in his studies of reading ability, Stanovich (1986) noted `the Matthew-effect'[47] which states that *even where all students improve*, the achievement gap between strong and weak students increases over time. OECD statistics show that some 20 per cent of children in participating countries are disadvantaged and have problems at school. This figure echoes Warnock's[48] estimate of students who had some form of `special educational needs'. The performance of some groups consistently falls behind that of others:

- boys tend to do less well than girls,
- some ethnic groups do less well than others (for example, Aboriginal and Torres Strait Island students in Australia, Afro-Caribbean students in England, Hispanic and Black students in the USA)
- students from economically/socially disadvantaged households[49].

How can education systems meet the dual challenge: to provide equitable opportunities and to minimise the disparity of outcomes?

New Zealand

The meritocratic ideology is evident in the principles of achievement for all, and equal opportunities, and in the recognition that levels are not tied to ages and years. A common entitlement is secured through a compulsory curriculum, and individual differences between students are addressed through differentiated provision. (*See 3.8 below.)*

The New Zealand Curriculum Framework and Statements seek to promote respect for diversity, and optimum learning opportunities by recommending action at various levels, as outlined below

- **Recognition:** Individual differences between students result in differences in learning and performance; teachers (and students) have a responsibility to respect and respond appropriately to all members in their community, and expectations and provision must be adapted accordingly. Schools are urged to

... identify such students as early as possible in their development, provide them with supportive learning experiences and environment, and devise assessment methodologies appropriate to their learning. (the Arts)

- **Context:** All the Statements define the conditions for a safe, supportive and non-discriminatory environment ensuring that all students have equitable access to resources (teacher time, learning assistance, technologies), across all learning activities and that both girls and boys take active leadership roles.
- **Behaviours and attitudes:** The Statements recommend teacher modelling, exploration of issues, feeling and desirable behaviour, as specific means of identifying, practising and developing desirable behaviours and attitudes.[50] The development of personal respect for individual differences is part of the content of the Social Studies programme (*page 22*) and attitudes towards, and the development of stereotypes are explored in several learning areas.[51] Where teachers make explicit links between these studies and experiences within and beyond the classroom, they can help develop appropriate behaviour and attitudes.
- **Support during the learning process:** Teachers are encouraged to adapt the content, context and learning experiences and to incorporate a range of experiences that are relevant to the knowledge, skills, and aspirations of both boys and girls, using gender inclusive and language, resource materials, and illustrative examples
- **Support during the assessment process:** Different needs may be addressed through the content, context or assessment experiences. Examples include recognition of alternative modes, such as group work and oral presentations.

However, and New Zealand is not alone in this, concerns remain about the inadequate level of achievement of the weakest students, and the gap between their performance and that of the most able students.

ISSUES

To what extent can schools overcome social and economic disadvantage?

Do international studies, and the resulting pursuit of `world class education' motivate governments to focus on the achievements of the best students at the expense of the others?

Does the identification of a separate group of gifted and talented lead to the assumption that some learning strategies should be reserved solely for this group?

Does the grouping of students according to race, gender, family background etc. result in an (unjustified) assumption that the learning needs of those within each group are identical?

Individualised teaching may require more resources, without necessarily achieving a common core attainment for all. How is equal opportunity measured?

3. THE INTEGRITY OF THE NZCF AND THE STATEMENTS

The previous section outlined different curriculum models, and commented on the ways in which ways in which the New Zealand curriculum addressed the associated functions. No judgements were made about the relative merits of the models or about their appropriateness for New Zealand. In contrast, it is assumed that the seven Curriculum Statements[52] *should reflect and carry forward* the principles and priorities outlined in the New Zealand Curriculum Framework (1993) as `*the foundation policy for learning and assessment in schools*'. This section examines the extent to which `*the principles which give direction to the curriculum in New Zealand schools'* (*NZCF* pp 6-7) are enacted in the Curriculum Statements[53], and identifies gaps and tensions. Theoretical and practical issues arising from the structure of the curriculum are addressed in Section 4.

3.1 Individual Development

`*The principles of the New Zealand Curriculum are based on the premises that the individual student is at the centre of all teaching and learning ...'*

This premise has wide popular appeal and is the basis of the educational philosophies expounded by Dewey, Montessori and Rousseau, among others. The engagement of learners in determining the what and how of learning has been found to be beneficial because `*self-directed educational paths are meaningful and powerful for pupils in education, even for very young ones'* (Pieters, 2000, cited in Letschert, 2001, page 285).

However, a balance needs to be maintained between the interest of individual students and the requirements of society (in term of transmission of knowledge and values) and economy (in terms of human resource development). Letschert (2001) argues that teachers face a trilemma between three perspectives:

- *learner*: providing the conditions to develop the unique and individual potential of each individual
- *content*: transmitting common and established curriculum content, and
- *instrumental or societal*: developing the skills, attitudes and knowledge deemed necessary to function in a (multi-cultural) society.

Egan (1997) agrees that teachers often experience these as contradictory perspectives but highlights the dangers of imbalance:

- an exclusive focus on *child development* can cause tension in the face of the requirements of society
- education that is excessively *content-driven* takes insufficient account of the child's individual, social, emotional and values development
- education that concentrates solely on *instrumental or societal dimensions* carries the risk of following short-term priorities.

Letschert argues that `*a standard programme does not fit ... because there are no standard children.'* (Letschert, 2001, page 287) At first sight, therefore, a common curriculum, based on a sequential model of learning and which measures progression in levels linked to years of study, would appear not to support an individualist, developmental perspective.

Many New Zealand critics perceive an insurmountable tension between the child-centred pedagogies and the `behaviourist' Achievement Objectives. *(See 4.3 below.)* However, a behaviourist framework, when used as a measure of *input* rather than of *output*, can sustain the development of children as the guiding principle. The Statements urge teachers to focus on the individual's learning needs in terms of :

- *context* of learning and assessment, which draws on the experiences of the individual student and gradually extends outwards to include home/family, community, to the wider world
- *pedagogic approaches* which stress the need for understanding and practical experience in relevant and realistic situations, as well as memorisation of basic facts *(see 5 below)*
- *awareness of individual differences* arising from the student's gender, culture, race and specific abilities and needs *(see 3.8 below).*

ISSUES

Is the prescription of (any) curriculum inconsistent with the concept of individual development?

Is it possible to `prescribe' an interest driven curriculum?

3.2 Breadth and Balance

`*The New Zealand Curriculum establishes direction for learning and assessment in New Zealand schools ...will give all students the opportunity of a broad and balanced education...'*

The New Zealand Curriculum Framework and Statements ... [promote] new emphases in learning areas which are important to the country's health and growth such as Technology, second language learning, te reo and nga tikanga Maori and studies of New Zealand and those regions important to New Zealand such as Asia ands the Pacific. (NZCF p. 1*)*

Whilst most of these learning areas are carried through into curriculum Statements, languages other than English and Maori[54] perform a subsidiary role, for example, to *enhance understanding of English* by comparison with Maori and other languages.[55] Separate curriculum guidance has been produced for a number of international and community languages, but there are no statutory requirements for students to study a second language at any level. New Zealand is not alone; foreign language learning is also under-represented in other anglophone countries, especially when compared with European countries. Four explanations spring to mind:

- given the prevalence of English in international communications, there is no `obvious' foreign language for anglophone students
- a similar prevalence of English in [youth] culture means that the affective and social support for foreign language learning is diminished for anglophone students
- language learning is labour intensive and many countries have a shortage of suitably qualified teachers
- the conflicting objectives of foreign languages for communication and as a grounding for further linguistic and literary studies mean that only a minority of students experience real success.

Nevertheless, given the explicit intention quoted above, the omission of statutory foreign language learning represents a shortcoming in the curriculum.

The priority accorded to learning about regions important to New Zealand is explicit in the Social Studies Statement. However, given that the `essential learnings about New Zealand' are listed in detail and the other settings are not, the broader intentions may not be carried through into practice, particularly if teachers perceive the Statements as checklists for audit purposes.

ISSUES

Does the lack of compulsory foreign language learning disadvantage New Zealand students in terms of personal, cultural and conceptual development, and inhibit their mobility and/or economic competitiveness?

3.3 Achievement

`*The New Zealand Curriculum fosters achievement and success for all ...'*

All Statements explicitly recognise this principle, taking the compulsory nature of the curriculum as a proxy for entitlement, but it has been suggested that the curriculum intentions have not been fully implemented.[56]

In order to achieve this objective,

- the curriculum must recognise the different motivations and ambitions of students. Experience - not only in New Zealand - shows that students of all abilities may underachieve at school because what they perceive as `worthwhile learning' is not included in the curriculum
- organisation and pedagogy must be flexible, to match students' abilities and aptitudes *(see 3.8, and 5 below)* and
- all schools must be enabled to implement the curriculum to its full extent. This has implications in terms of resources and staff development *(see 6.4 below)*

ISSUES

To what extent does the curriculum value and include what students and their communities value?

3.4 Clear, Measurable Objectives

`*...it clearly defines the Achievement Objectives against which students' progress can be measured.'*

`*It defines the essential learning areas and skills, and defines the national achievement aims and objectives for all students in terms that are understandable to them, their parents, and the wider community, as well as to teachers.' (NZCF* Introduction*)*

The Achievement Objectives are the most contentious and, arguably, the weakest, element of the curriculum documents. They are perceived, and act, as a constraint on teaching and learning, but they do not lend themselves to reliable assessment and meaningful reporting of performance. *(For issues relating to an objectives-based curriculum, see 4 below).*

Contrary to the stated intention, the Achievement Objectives are not, for the most part, expressed in terms that can be measured. The desire to divide achievement in all learning areas into eight levels has, in some cases, rendered the characteristics of performance at

adjacent levels indistinguishable.[57] Furthermore, the interpretation of achievement outcomes and their translation into learning outcomes and learning experiences is devolved to individual schools and teachers. Teachers without ready access to subject specialists (for example, in small primary schools), or inexperienced teachers, may find it particularly difficult to devise appropriate outcomes and a range of contributory learning experiences. Student grading thus depends on the expertise, experience and time available to schools and teachers and may become arbitrary. In the absence of standardised assessment[58], each school has devised its own way of meeting NAG requirements (1993), subject to ERO approval. The potential for schools to learn from one another has been undermined by variations in interpretation between ERO regions and even between ERO reviewers.

Whilst not making the case for universal student assessment, these experiences do raise questions about the usefulness of the Achievement Objectives either as a formative assessment tool or for communicating performance *in relation to national achievement aims,* to students, parents, employers and others.

3.5 Flexibility

`*The New Zealand Curriculum provides for flexibility, enabling schools and teachers to design programmes which are appropriate to the learning needs of their students.'*

Generally speaking, the curriculum documents provide *suggestions for learning, teaching, and assessment* (the Arts, English) and *guidance* (Health and Physical Education) to support teachers in their development of suitable learning experiences and assessment; authors go to great lengths to stress their non-prescriptive intentions.[59] The Science Statement further distinguishes between the Achievement Objectives, which *are* prescriptive and other aspects of the learning, which are not.

In contrast, the Social Studies Statement prescribes the settings, perspectives, essential learning about New Zealand society and assessment, in the framework of Achievement Objectives, strands and processes. Teacher discretion is limited to *some* elements of the essential learning about New Zealand, and the learning experiences relating to the `other' settings. This raises questions about the perceived importance of the latter and the priority which teachers should, or do, accord to them.

In its introduction, the *NZCF* reinforces the intention of flexibility, pointing out that the Statements `*provide national direction whilst allowing for local discretion. All schools must ensure that the principles are embodied in their programmes'* However, the fact that the Statements are Gazetted, suggests that they are regulatory in their entirety, an impression reinforced by ERO reviewers. As a result, some teachers have resorted to developing checklists to demonstrate their compliance with the regulations.

ISSUES

Does the desire to ensure a common base of learning and measure its achievement prevent schools from adapting provision (a) to meet local needs and (b) to stimulate student creativity and divergent thinking?

3.6 Progression

`*The New Zealand Curriculum ensures that learning progresses coherently throughout schooling... [building] on students' previous learning and [preparing] them for future learning.'*

Whilst all the Statements refer to learning in the post-compulsory phase, only the Arts Statement refers to pre-compulsory learning.

Progression in each learning area is marked at eight levels, each corresponding to about two learning years. Critics argue that there is no developmental or research basis for eight levels and, as indicated *in 3.4. above*, distinctions between the levels for some of the Achievement Objectives are sometimes contrived and unclear. Only in mathematics is there an explicit recognition that progression may not be best defined in eight levels, by using six levels for Number.

In some cases (for example, Mathematics, Science and Technology) progression is indicated in sample learning contexts, possible learning experiences, and assessment examples and for each achievement objective, at each level and for each of the strands. This is intended to guide teaches in planning learning for students both within and across Years. In other learning areas (e.g. the Arts, Health and Physical Education), the promised suggestions for learning, teaching, and assessment related to achievement outcomes are not always provided. This leaves teachers, especially non-specialists, vulnerable in the task of preparing students to meet `national' standards.

Greater clarity and a common understanding can be promoted through supplementary materials[60] and staff development for teachers and other education professionals on the one hand, and by targeted dissemination to partners, employers and other members of the community. (This raises the question of what constitutes the curriculum - and how much should be included in a curriculum statement, *see 6.1 below*.)

The reference to building on prior learning applies not only to content but also to constructivist pedagogy, which is developed in the learning resources provided for teachers.

ISSUES

How does education in compulsory education build on the pre-school experience?

In the light of experience, should eight levels of Achievement Objectives be retained in all areas and elements?

3.7 Lifelong Learning

`*The New Zealand Curriculum encourages students to become independent and lifelong learners'*

This principle is addressed in some Statements, through explicit objectives, for example, the development of lifetime habits relating to nutrition and exercise (Health and Physical Education) and to encourage and assist students to participate in and develop a lifelong interest in the Arts. Only the Mathematics and Science Statements explicitly express an expectation that students will continue these subjects after the compulsory phase.

Whether or not a predisposition towards lifelong learning is developed depends largely on the teaching methods (*see Section 5.4*), the nature and content of learning, and the degree of satisfaction and enjoyment[61] which students experience. Many of the essential skills grouped under `self-management' and `work and study' contribute to making education a satisfying and successful experience and thus develop both the skills and attitude necessary. However, the formulation of the curriculum in terms of Achievement Outcomes may cause some teachers to narrow the learning experiences they offer students, lest they have insufficient time to `cover' the curriculum. These trends may undermine students' intrinsic satisfaction and hence their disposition towards lifelong learning. Mansell (1999) also notes that in both content and method, `*the descriptions suggest that it is the teacher identifying student needs; dialogue, student input or negotiation barely features'*. This approach is in tension with the development of student responsibility for their learning.

ISSUES

Does the focus on short-term objectives diminish students' enjoyment and success and thus undermine their commitment to lifelong learning?

3.8 Equal Opportunities

> *`The New Zealand Curriculum provides all students with equal educational opportunities.'*

The *NZCF* identifies four main groups of students as warranting special attention:

- students with different abilities and disabilities (students with learning needs and, usually considered separately, gifted and talented students)

- female and male students

- students of all ethnic backgrounds (Maori students and students with other cultural/linguistic backgrounds)

- students of different social and religious backgrounds.

Most Statements identify an explicit entitlement[62], refer to the need for non-discriminatory language, content[63] and behaviour, and equal access to resources and teacher attention. However, as indicated below, specific guidance is limited. Several indicate that an inclusive curriculum, which recognises the perspectives of a particular group of students, can enrich education for all students.

3.8.1 Students with different abilities and disabilities

- **Students with learning needs**: There are suggestions in English concerning access to the curriculum (e.g. visual communication, Braille text) or intensive support (e.g. through the Reading Recovery programme and in the provision of readers, writers or interpretations). The mathematics curriculum Statement points to the benefit of using apparatus to provide concrete examples of abstract concepts.

- Arts curriculum Statement reflects the findings of Gardner (1993, 1999) by explicitly recognising that alternative means of expression can help students learn and demonstrate their achievements.[64] Consequently, those with learning difficulties `*may still achieve highly in one or more of the Arts disciplines*'.
- Science Statement identifies students with physical and/or mental disabilities, with specific learning difficulties, and those yet to achieve fluency in English. However, it makes no specific suggestions beyond suggesting that teachers work with `*[the students], their peers, their teachers, their families, and the wider community work ... to plan and deliver programmes which meet their particular learning needs*' to encourage participation and use appropriate resources, equipment, and Technology.
- **Technology** Statement provides no explicit guidance, but its teaching approach focuses on individual working and this should facilitate flexible provision.

- **Gifted and talented students**: Specific examples are lacking in the Health and Physical Education, Science, Social Studies and Technology Statements. The Arts Statement refers to the Ministry of Education publication *Gifted and Talented Students: Meeting Their Needs in New Zealand Schools* as a source of support for teachers.[65]

- are a few examples of extension activities in English, (which encourage able students, for instance, to progress from the *study* of a text in a given genre to the *creation* of a piece of original work in the same genre, or to prepare a presentation for

once audience and then adapt it for another), but examples of literary texts that challenge and extend students with special language abilities are not systematically provided.

- outstanding exception is the Mathematics Statement, which reiterates the principle of entitlement[66] and carries it through to the coherent provision of extended learning at all levels in a section labelled Development Band. Extended learning stimulates understanding and interest and is characterised as including work at the same level as other students, which allows better students to investigate whole new topics which would not otherwise be studied and to work at a higher conceptual level. The range of teaching strategies outlined on page 19[67] could equally be applied in other learning areas.
- Science Statement urges teachers publicly to value and encourage higher order thinking and to use the curriculum flexibly to provide opportunities for students to `*learn through open-ended activities which encourage imaginative and creative thinking and lateral exploration of ideas, use co-operative and problem-solving approaches to learning [and] communicate their ideas with others of similar ability*'. However, the association of these active and partnership learning approaches specifically with the more able may undermine their use with other students, who could benefit equally from active learning approaches.

3.8.2 Female and male students

The curriculum offers numerous opportunities for exploring and developing positive gender attitudes and Statements provide examples of the ways in which girls and boys may be disadvantaged generally[68], or in specific subject areas.[69]

Specific recognition is given to the effect of inappropriate mathematics teaching on the development and motivation of some students, in particular, girls. Strategies include a range of dimensions: cognitive (extended investigation and the development of subject-specific skills), contextual (setting the subject in its social, philosophical and historical context), inter-personal (exploiting girls' language strengths and assigning co-operative learning tasks) and affective (express their experiences, concerns, interest and opinions).[70]

Two Statements make an important point about stereotyping:

` *the group "girls" is not homogenous. Culture and gender factors are inextricably linked and neither should be considered in isolation. The particular perspectives of Maori and Pacific Islands girls should be acknowledged.'* (Science Statement page 11-12)

All students should be encouraged to explore all areas in a range of contexts, and should not be limited by traditional assumptions or perceptions of what will "interest" girls, boys, or other defined groups. (Technology, page 15)

In doing so, they underline the fact that all students need to be exposed to *a range* of teaching strategies, enabling each to respond to the methods which best meet his or her needs and dispositions. Assumptions about `appropriate strategies' for (broad) categories of students may be as counter-productive as undifferentiated provision.

3.8.3 Students of all ethnic backgrounds

- **Maori students** *(see also 3.9).* It may be due to New Zealand's emphasis on its bicultural heritage that, of all the `special' groupings, Maori students appear best supported by the curriculum. This is reflected in the use of Maori concepts and language throughout the Statements (especially the Arts and Health and Physical Education) and a wide range of examples of adapting lessons to enable Maori students to perform well by means of enhancing their English communication skills[71], respecting and reinforcing *te reo Maori* [72] [73], and Maori background and context[74], content[75] and (perceived) learning and assessment styles[76]. The Science Statement

mentions the importance of `*access to positive Maori role models, including Maori teachers, in their Science programme*'. Whilst there may be other contributory factors, it is interesting to note that Science is the only area where the achievement gap between Maori and non-Maori students in primary education has closed between 1995-1999.[77]

- **Students from other cultural groups** *(see also 3.10):* The *NZCF* and the curriculum Statements stress the importance of recognising the cultural diversity of New Zealand society and of catering for students from all racial, cultural and linguistic backgrounds. Support is focused on positive inter-ethnic attitudes, language, context, content and teaching approaches. However, as indicated *in 3.10 below*, the predominant position accorded to Maori culture tends to overshadow the position of the other cultures in New Zealand society.[78] Whilst teachers are urged to make links with cultures in the local community as sources of knowledge and appropriate practice, this places additional demands on their time and, where teachers are unable to do so, there is a risk that `multi-cultural' will be restricted to Maori and Pakeha.

The English Statement sets teachers a formidable challenge when dealing with students whose first language is not English:

... The prior knowledge, first language, and culture of each student should be respected and incorporated in English programmes. Where students have some facility in the first language, they should initially be encouraged to explore tasks in that language, moving between their first language and English. ... (English Statement page 15*, my emphasis*)

3.8.4 Students of different social and religious backgrounds

Despite the recognisable effect of social background on student performance, provision for students of different social and religious backgrounds is not specifically addressed in any of the curriculum Statements. Is the failure to carry this principle through due to a perception that the learning needs of students in low decile schools are not identical and may be covered under other categories of need (e.g. gender, ethnicity)?

ISSUES

Which distinct learning needs of students of different social and religious backgrounds did the authors of the Framework have in mind?

Does the New Zealand curriculum treat groups of students (Maori, girls) as single, homogenous entities, thereby reinforcing stereotypes and failing to recognise individual needs, as well as the cumulative needs of students who belong to a number of disadvantaged groups?

If learning increasingly involves access to computers, what are the implications for equitable access by students within and outside school?[79]

3.9 The Significance of the Treaty of Waitangi[80]

The most striking feature of the curriculum is the recognition given to New Zealand's `unique' bicultural heritage and its importance for all New Zealanders. Maori terms are used in all Statements, (for example, *hauora* is used to convey the multi-dimensional nature of well being in Health and Physical Education) and the Science Statement includes a detailed glossary of Maori vocabulary.[81] It is not clear whether the use of Maori terms is principally intended as a device for including Maori students or, because the Maori terms represent a different or wider concept (say, of well-being), to draw attention to this wider understanding within the learning area.

In Social Studies**,** the formal study of the Treaty of Waitangi, its interpretation and its consequences, is a key element of the `essential learnings about New Zealand society'. The Bicultural Perspective (Maori and Pakeha) is intended to increase students' knowledge and understanding of their shared history, as follows:

In Aotearoa New Zealand, toi Maori*, the Arts of the Maori, are integral to our sense of a distinctive, evolving national identity. New Zealand artists often draw on and combine [many] art forms, along with traditional Maori forms such as poi,* whare whakairo*, and* moteatea*, to create distinctive, contemporary art works*. (The Arts)

All students should be encouraged to appreciate New Zealand's bicultural heritage. In their approaches to teaching and learning, in the issues that are addressed, and in their selection of spoken, written, and visual texts, teachers should include Maori perspectives. New Zealand texts, including those by Maori authors and about Maori, should form a significant part of the wide range of text that students will explore. New Zealand's unique linguistic situation includes its own distinctive varieties of English, and the indigenous language, Maori, which has an important influence on the development of English in New Zealand. (English)

The inclusion of Maori knowledge about the natural and physical worlds will enrich the curriculum for all students (Science)

Many technological activities derived from Maori experience already feature in educational programmes, although they have not always been recognised as Technology. Consultation with, and involvement of local iwi*,* kaumatua*,* kuia*, and advisers is crucial in the recognition of* tikanga *in Technology education* (Technology)

In recognising New Zealand's unique bicultural heritage, physical activity embraces nga mahi a rehia *Maori recreational and leisure activities including* te reo kori*. These activities are unique to Aotearoa New Zealand knowledge, traditions, and movement skills from the past along with adapted contemporary movements.* (Health and Physical Education)

ISSUES

What is the potential for cultural conflict between the teaching of English as the dominant language in mainstream schools and the place of `language [as] a vital medium for transmitting values and culture. Confidence and proficiency in one's first language contribute to self-esteem, a sense of identity, and achievement throughout life*.' (NZCF* p 10*)*

Does the use of Maori terminology promote the integration of the different communities?

Would the use of Maori terminology be problematic for non-Maori-speakers, or are have these terms become absorbed into New Zealand English?

Does the use of Maori terminology enrich the conceptual understanding of students in general?

3.10 The Multicultural Nature of New Zealand Society

The culture, history and experiences of non-Maori students (other than those with European ancestors) are most widely reflected in the curriculum of the Arts:

European, Pacific, Asian, American, Indian, and African Arts have progressively become part of the New Zealand cultural tapestry. Our cultural heritage now includes such traditional art forms as Celtic dancing and design, colonial architecture, orchestral and choral music, tapa *and* tivaevae, raku *and earth fired pottery, puppetry, dragon dancers, plays, musical theatre, and landscape painting.* (The Arts)

They also occur in the multi-cultural perspectives of Social Studies, and in the study of the historical perspectives and contribution of contemporary groups (Technology). The Health and Physical Education Statement refers to the cultural customs and values, and the need to consult the relevant community representatives.

However, in most cases, Statements provide little direct guidance for teachers. Indeed, where examples are provided, they often relate to Maori culture, and teachers are left to identify context, content and behaviours which reflect the `other cultures'.[82]

In some cases, the curricular content may be unacceptable to some communities.[83]

ISSUES

To what extent does respect for and implementation of the Treaty of Waitangi and other legislation - te aho matua *etc - give priority to biculturalism at the expense of the Chinese, Korean, Pacific and other non-Maori cultures within New Zealand schools and society? Is this carried through in terms of structures and resources?*

3.11 The Wider World

This principle is addressed in most Statements, by reference to:

- the role played by the learning area or skills in daily life (e.g. the Arts, language, mathematics, Science, Technology)
- ways in which the learning area prepares students for, or enhances the quality of their adult life (e.g. language). In some cases, Statements refer to the way in which knowledge and skills (such as critical thinking) can empower the individual to enhance their future environment and society (e.g. Science, Social Studies, Technology).

Furthermore, formal learning supports this principle at three levels:

- *Learning about people, events and places outside New Zealand* occurs incidentally many learning areas (e.g. the Arts, Science, Technology) and explicitly in Social Studies, where one of the `settings' focuses on the wider world, with priority given to *... the Pacific, Europe, and Asia ...because of their particular significance to New Zealand.*
- *Learning about the interdependence of New Zealand and the wider world* includes the socio-ecological perspective identified in Health and Physical Education and Science[84]
- *Learning with and from people in the wider community* outside the school is a feature of many learning areas, but is especially stressed in the Arts (page 103) and Technology (page 7 and page 17). In both these cases, detailed guidance on the contribution of, and effective collaboration with, outside specialists is given. This includes details on setting appropriate guidelines for non-teacher adults.

ISSUES

To what extent does the prescriptive nature of `essential learnings about New Zealand' and the lack of detail on the `other settings' undermine the achievement of this principle?

4. CONCEPTUAL FRAMEWORK

4.1 Theoretical Underpinning

As indicated in Section 2, education is becoming increasingly politicised. There is evidence in many countries of rapid - and in some cases extensive - changes in the curriculum and assessment. National policies are influenced by fact finding missions, international surveys (e.g. TIMMS[85] and PISA[86]) and information exchange (e.g. conferences, web sites such as *INCA*[87], *EURYBASE*[88]). These findings do not necessarily show that the policies are effective in their home context, nor that they are relevant or feasible in a different context. However, (Bachmann, 2001, page 265) argues that the time lag between the development of new concepts in educational policy and their implementation - or the perceived effects of their implementation - is a great challenge for educational policy makers. They have the difficult task of anticipating future societal developments. `*Thus international cooperation can be considered a part of a new international support structure for school development.'*

The functions to be fulfilled by education vary in accordance with the ideology of the political and other interest groups over time. Since the Second World War, the dominant ideologies have included developing individual potential to the full (within differentiated structures), `equal opportunities' (within a non-selective structure that provided special help for the socially disadvantaged), meeting individual learning needs (within an inclusive environment) and, most recently, the efficient provision of `World Class' education. `World Class' is often not defined, but is usually determined by reference to the country's position in international education survey results. The weakness of this approach is that it assumes that all participating countries share the same aspirations, have common needs and comparable resources.

Tensions arise between the needs of the individual and of society. Letschert (2001) argues that when education systems introduce targets, the guiding principle is no longer the development of children, but the achievement of content and skills standards. This immediately raises the question of what happens to children who fail to meet the standards. This fear contrasts with the teachers' views that the clarity of expectations focus their, and their students', attention and thus improve the quality of learning (Mansell, 1999).

The New Zealand curriculum reveals two main philosophical influences.

- The **behaviourist** underpinning of the curriculum is criticised (Kelly 1988, 1990; New Zealand Education Institute, 1991) because its narrow focus on `right answers' rather than `tolerance of ambiguity' is seen to be suitable only for low-levels skills. The assumption that the curriculum can be broken down into a hierarchical structure and defined in terms of quantifiable outcomes `commodifies' education and the curriculum becomes a piece of intellectual property which can be bought or sold (Grace, 1990; Bates, 1991). However, whilst an objectives-led curriculum *can* be implemented along these lines, and there is a tendency, on the part of some teachers, to restrict learning to coverage, teachers generally reported that the Achievement Objectives support their teaching by structuring learning experiences and identify progression (Mansell, 1999).
- The recurrence of similar Statements and similar intentions throughout the levels indicates that the New Zealand Curriculum explicitly recognises the non-sequential, iterative nature of meaningful learning. Learning examples `*need not be confined to the level suggested. They may be enjoyable and useful for a wide range of students, who can be expected to achieve the objectives at different levels of competence*.' (Technology) *Learning in each discipline is spiral in nature and, at each level, it includes and builds on learning from the previous levels. Opportunities to revisit, make connections with, and extend existing skills, knowledge, and understanding assist students to learn in depth*... (The Arts Page 15).
- The **cognitive/developmental** approach underpins the constructivist pedagogy (recommended in the New Zealand curriculum). It encourages students to make sense of the environment through a process of experiential learning, reflection and renewed learning (accommodation and assimilation)[89], to inform judgements, fresh insights and new learning. It may also enhance enjoyment and engender a sense of achievement, and therefore develop a positive approach to lifelong learning.

However, Burns (1997, *see 5.4*) questions the extent to which the constructivist intentions are carried through.

ISSUES

The New Zealand Curriculum Framework was set out in 1992, before the theories on learning styles, modalities and multiple intelligences were commonly accepted. To what extent should the Statements be revisited to take account of these theories, and research into their effectiveness?

How can a curriculum based essentially on the accreditation of individual achievement at particular times, accommodate the sharing of knowledge and skills of a group?

4.1.1 Central prescription

At the start of the 21st Century, most schools follow a curriculum laid down at national or regional/state level. In some countries the requirements are set out in detail[90]; elsewhere there are frameworks, within which schools develop individual curricula suitable for their students and context.[91] Where the curriculum is not statutory (for example, in Scotland), teachers tend to follow the guidelines, especially where they include exemplification materials. In the USA a harmonising influence is exercised by a limited number of states (e.g. California) whose curriculum requirements dominate the textbook market. Even in the absence of prescription, (for example, England prior to 1988, the Netherlands) curricula tend to be structured into a fairly homogenous provision of subject matter, which increases in response to societal expectations.

Three main models have been adopted:

- **Input models** specify the content and, usually, the number of hours to be spent on the study of each subject and predominated in the latter half of the twentieth century. Input models are criticised for their focus on teaching rather than on learning.
- Concern with the student performance, and the effectiveness of the education system as a whole, led to the introduction of **output models**,[92] although the approaches varied. In England, programmes of study and attainment targets (in ten levels) were devised to indicate what students were expected to learn, and to what level. In contrast, `core objectives' in the Netherlands are `aspired targets' i.e. criteria for educational provision, not for student achievement. Letschert (2001) argues that if the same learning standards are to be achieved by nearly all students in the heterogeneous population, the norm will have to be on the low side, with the result that the objectives have limited value. Therefore, `aspired objectives' with an ambitious character are preferable, because high expectations of students have proved to be a good means for raising achievements. Teachers can be asked why they have not met the aspired objectives in specific cases; usually they have very credible reasons.
- The use of output models to guide education raises a number of questions.

- To what extend can different forms of learning be quantified?
- Does an outcomes-based system explicitly value, and therefore promote, the teaching of aspects which can be readily assessed, at the expense of higher order skills which are harder to quantify?
- Does outcomes-based education favour short term results at the expense of longer term developments such as attitudes and dispositions?
- Does outcomes-based education stress the extrinsic or instrumental benefits of learning at the expense of its intrinsic value, and thereby undermine the disposition towards lifelong learning?
- How readily can outcomes be converted into learning experiences?

- The foregoing questions, and the need to develop high level learning and skills, have turned the focus towards **process models,** which draw on research-based learning methodologies. Insofar as higher order skills may be more difficult to assess in the short term, the effectiveness of this approach may not emerge for some time.

The New Zealand curriculum is centrally determined, but incorporates elements of all three models by defining (some) content and expected performance in Achievement Outcomes, and encouraging the adoption of a wide range of teaching methods.

ISSUES

How do teachers reconcile the apparent inconsistencies between the Gazetted requirements, the revised NAGS and associated guidance[93], exemplary materials and the (perceived or stated) expectations of the ERO reviewers?

4.1.2 A compulsory curriculum for all

Several countries require all students to follow a common curriculum throughout compulsory phase[94] to ensure that all students have access to a broad and balanced curriculum and to defer specialisation. Critics (e.g. Watson, 1996) question the suitability of this requirement on the grounds that it spreads the talents of the least able too thinly whilst unnecessarily limiting the scope of the most able. In some countries this concern is addressed by varying the content of compulsory subjects match the students' ability. In Singapore, students are streamed from age 10, according to their performance in English, mother tongue and mathematics, and the weakest students have more time allocated to mathematics but cover fewer topics. In this way, they have an increased chance of achieving a minimum agreed standard. In the USA, high school students choose from a range of *courses* within a given subject. Provided they accumulate the necessary courses in each area, students may graduate, but the nature/level of courses determines students' future education or career options.[95]

In England, the common curriculum introduced in 1988 has been gradually adapted, to allow greater flexibility for students aged 14-16. There are currently proposals to enable students to choose vocational courses, in part to redress the `*historic failure to put the same value on vocational qualifications as on academic ones*' (Secretary of State, interview 11 February 2002).

In most countries, a higher degree of choice is allowed at upper secondary level, but this may be limited by requiring students to follow the full curriculum associated with a given learning track[96]. Students in England may choose freely, from the subjects offered by their chosen school or college, but new examinations have been introduced to reduce the high degree of specialisation during the final two years of secondary education.

The New Zealand curriculum prescribes a common requirement throughout the primary phase (Year 1-8) and the first two years of secondary education (Years 9-10). It specifies 'opportunity for breadth' in years 11-13 but, in practice, this is voluntary in nature and student choices may not reflect the breadth intended by curriculum developers. However, this tendency towards specialisation is found, to a greater or lesser degree in a number of countries, for example, England, Ireland, Italy and the Netherlands.

ISSUES

Does the common requirement undermine the opportunities of both able, and weaker students to achieve their potential?

4.2 Formulation of the New Zealand Curriculum

The New Zealand curriculum is expressed as seven essential learning areas, eight groupings of essential skills and a number of attitudes and values which `*are supported by most people in most communities*' (*NZCF* page 21). The place of each learning area within the whole, is indicated in the title: (*Area) in the New Zealand Curriculum*. There are two areas where the terminology and/or content of the learning area differs from that of the curriculum Statement, namely Language and Languages (reduced to `English' or `Te Reo Maori') and Social Sciences (expressed as Social Studies during the compulsory phase, to be followed by individual subjects in the upper secondary phase).

Each curriculum document outlines, very clearly, the relevant Achievement Objectives, but the overall coherence of the *New Zealand Curriculum* depends in part on the relationship and reinforcement of learning between each of the elements (*see 4.2.1, 4.2.2 and 4.2.3*) and across the phases (*see 4.2.4*).

This does raise the issue of the `appropriate' amount of detail to be included in the Gazetted curriculum documents. If these are limited to the compulsory elements, it may be possible to bring together the underlying principles, the framework and the individual learning areas in one document, which may only require infrequent revision. Supportive documents, which do not require formal endorsement, can be easily and frequently adapted to reflect changes in suggested content and teaching approaches.

ISSUES

Are the Statements too detailed? Would it be more helpful to separate the compulsory elements from the exemplification and guidance?

Can the degree of specification be reduced once teachers learn from specification and exemplification

4.2.1 Subjects versus learning areas

The main benefit of a *subject-based curriculum* are that subject specific skills and approaches receive due emphasis (assuming subject specialists are available) and prepare students for the demands of higher education. The disadvantage of this structure is that the school day does not allow for in-depth study of up to 15 subjects, each with a substantial amount of `essential' learning. A choice therefore has to be made between breadth (covering all subjects superficially, sacrificing quality of learning) and depth (choosing fewer subjects, at the cost of a broad general education with a potential reduction of future learning or career options).

The *learning areas or domains* model has a broad theoretical foundation. Lawton (1989) analyses nine cultural variables, integrating the instrumental, the cultural and the pedagogical perspectives. Blom (1997) pleads for a curriculum based on domains (linguistic-literate; social-economic; science; technological-motorial; mathematical-logical; artistic and historical-philosophical) rather than subjects, on the grounds that it is recognisable from a cultural-historical perspective, covers the traditional content of subjects. There is also a relationship with Gardner's intelligences (1993, 1999). Hirsh, (1987; 1989) promotes a cultural-analytic approach, building basic knowledge (cultural literacy) in an encyclopaedic structure.

The integration of subjects into areas of learning (e.g. the Arts, the Sciences, Social Studies) allows local planners to give their school curriculum a local flavour. It enables teachers to draw attention to, and pursue links between subjects, thereby reinforcing and transferring learning and eliminating repetition. However, specialist teachers may stress their `subject' (e.g. history) and the subject specific elements (e.g. of geography, sociology) may be under-represented. Conversely, where secondary schools timetable constituent subjects separately (for example, in Scotland), the degree of intended cross-reference may be reduced. Moreover, whilst all areas are included within the curriculum for all students (e.g. all four Arts subjects), there may be a perceived loss of status for the individual subject (e.g. where music and drama are subsumed into the Arts).[97]

Most Statements refer to links and transfer of learning between learning areas.

- The Arts gives specific examples of the relationship between the different disciplines within the Arts, and between the Arts as a whole and the other essential learning areas (pp 94-8).
- English refers to film and other media (potential links with the Arts) and, in an extension activity, to Social Studies as a source of information on verisimilitude in films. The Statement expects teachers in all curriculum areas to `*develop approaches to teaching and learning that recognise the vital role of language competence in extending learning'* but does not exemplify how study of a `*wide range of written, spoken and visual texts will aid students' repertoire of language, and help them with their learning across the school curriculum.* It states that that ***for [ESL] students,*** *it is particularly important to make connections with other areas of learning'* suggesting that such explicit transfer is unnecessary for other students.
- Health and Physical Education makes no links beyond reference to three disciplines of home economics (*sic,* ignoring the `new' area of Technology), health education and physical education.
- The exhortation in Science `that secondary school Science teachers will work closely with teachers of Social Studies and geography when planning learning experiences (making sense of planet earth and beyond)' (page 107) may not be carried through in practice. [98]
- Only the Technology Statement supports the transfer of learning with good, specific examples of the relationship between Technology education and the other essential learning areas and points to the way in which out-of-school experiences enhance, reinforce, and clarify classroom learning.

However, the effectiveness of transfer depends on the extent to which schools plan the curriculum on a whole-school or cross-departmental basis. A second issue is nature of transfer. For example, where Science themes link to other learning areas[99], the teaching method will vary according to whether the Science teacher is *reinforcing* what had already been learned, or *introducing* knowledge or skills, which will be reinforced at a later stage in the other learning areas. The distinction is essential if students are not to experience the learning as simple repetition or as unrelated.

Other countries' curricula seek a compromise, by grouping some subjects (for example, into the Arts, the Sciences and Social Studies) during the primary and lower secondary phases. Even so, Slattery (1995) criticised the increasing disconnectedness and atomic content of discipline-based curricula as being meaningless for students and called for a post-modern paradigm of understanding curriculum in various contexts. Hernes (1994) proposed that education should be based on fundamental Christian and humanistic values and be structured around: the spiritual human being, the creative human being, the working human being, the liberally education human being, the social human being, the environmentally aware human being, culminating in the integrated human being. This approach embraces respect for individual interests, abilities and differences, and perceives social diversity as an enrichment of society (Letschert, 2001, page 281). Curricula along these lines are being explored in Northern Ireland (the individual, the individual as a contributor to society, the individual as a contributor to the economy and the environment)[100] and in Tasmania (Emerging New Essential Learnings), but have not yet been implemented.

ISSUES

Most countries have a curriculum based on subjects (even if grouped in tracks), and virtually all (including New Zealand) assess upper secondary students in subjects. How well does the (relatively) more integrated nature of the New Zealand Curriculum prepare students for the subject-based studies at post-compulsory level?

What is the effect of integrated areas on the status due to each subject in the curriculum Is it more difficult for students to adapt to the demands of single subjects at post compulsory level?

How do the cross-references match up with the learning objectives for students of corresponding ages? (For example The Arts: Level 3 Dance: electric current; Level 4 Dance sports theme, art theme; Level 2 Drama: guidelines on safety.)

4.2.2 Essential skills

As indicated *in 2.4 above*, key skills/competencies are an important feature in revised curricula in most countries, even where they are not separately identified.

It is intended that New Zealand's eight essential skills be incorporated into the teaching in all learning areas. All the documents refer explicitly to the contribution made by the relevant learning area to the essential skills. Without this, learning and reinforcement opportunities would be lost, either because teachers (wrongly) assume the links are evident to students, or because they themselves are unaware of the links. Some examples include:

- The Arts in the New Zealand Curriculum engages students in learning that contributes to developing the essential skills described in the New Zealand Curriculum Framework. It also provides opportunities for students to apply and reinforce skills developed in other essential learning areas. (The Arts p. 99). Examples of ways in which this can be achieved are outlined on pages 99-101.
- The Science Statement distinguishes between the skills that are intrinsically developed within the learning area (information skills and problem-solving skills are embedded in scientific investigation (p 44-51) and provide explicit examples of possible learning experiences related to the other essential skills in Appendix 2.
- The Social Studies Statement offers comprehensive coverage of how the Social Studies processes (inquiry, values exploration, and social decision-making) help develop and practise each of the essential skills, but the examples given for numeracy skills is quite contrived, namely to `*understand information which is presented in mathematical ways'*.
- Technology provides a clear and detailed indication of how Technology education helps students develop and practise the essential skills of the New Zealand Curriculum Framework (page 18)

Some skills are omitted from specific learning areas, for example English omits numeracy, competitive and physical skills and Mathematics makes only cursory reference. Health and Physical Education groups information skills, numeracy skills and work and study skills together and gives them less attention than other skills. The practical life skills such as parenting, consumer, transport and household maintenance and first aid skills also appear to have no clear `home'.

The main focus of information and communication Technology (ICT) skills is to their role as a tool for learning, rather than as a means of instruction; an important distinction.

However, it raises a number of issues relating to:

- equitable access to the technology
- the extent to which students can be allowed to explore in depth, or to pursue individual interests
- monitoring productivity, that is, ensuring that students are learning and not simply `surfing' aimlessly, and
- securing high quality web-based support materials specifically linked to curriculum requirements (enabling teacher to focus on exploitation and tailoring for needs, rather than creation of a virtual Intranet).

Whilst the `action' skills are reflected in Statements and Achievement Outcomes, the attitudes and dispositions (e.g. initiative, perseverance, courage; self-esteem and personal integrity; integrity, reliability, *aroha* fairness, *rangimarie*, hospitality etc), which are mainly categorised as self-management and competitive, or social and co-operative remain largely implicit. This

may be because they are problematic in terms of assessment, and no assessment regime is specified. It is therefore difficult to view these as anything more than admirable aims.[101]

New Zealand is the only country to list `competitive skills' as an essential skill. Others appear to be sensitive to the implied inequality. For example, in England, inter-school competition (through the mechanism of parental choice, league tables and funded initiatives) is counterbalanced by funding mechanisms and specialist programmes[102] which promote inter-school cooperation and support. The abolition, in some schools, of prize-giving and competitive sports is justified on the grounds that this creates more `losers' than `winners'.

4.2.3 Attitudes and values

These are explicit in many subject areas, either through the content strands (for example, the social, economic and environmental impact of scientific discoveries and technical applications and, for older students, ethical issues such as those associated with reproductive technologies; values exploration, bicultural and multi-cultural perspectives and gender perspectives in Social Studies) or through a learning approach which encourages students to explore, challenge, think critically about, and clarify both their own attitudes and values, and those of others.

Here again, where teachers and students feel under pressure to `cover' the curriculum, less attention may be given to these relationships, an approach implicitly endorsed by the *NZCF* statement that `*values are mostly learned through students' experience of the total environment rather than through direct instruction'* (*NZCF*, page 21). A study of school ethos is therefore necessary to determine the extent to which these intentions are realised.

ISSUES

How can schools and teachers be supported to ensure that the `total environment' is conducive to the development of appropriate attitudes and values?

4.2.4 Relationship between the phases

Only the Arts Statement indicates how the curriculum builds on prior learning in pre-compulsory education: *The Statement also builds on foundations for learning in the Arts described in Te Whariki, the curriculum for early childhood*. (Foreword) This may be because *Te Whariki* had not been developed when the earlier Statements were written.

In most subject areas (for example, the Arts, English, Health and Physical Education, Social Studies, Technology) the relationship between the compulsory and post-compulsory phases are limited to an indication that the curriculum provides the basis for planning post-compulsory study in Years 11-13, and that external examination requirements `*will also be informed by this Statement and its Achievement Objectives.*' (English, page 21)

However, the Mathematics and Science Statements are more optimistic about students' likelihood to pursue their studies and identify the range of options and the relationship between the standards at levels 6-8 and the credit units for the National Certificate.

The three aims set for senior secondary mathematics range from the necessity to consolidate more basic mathematical skills, through the requirement to establish vocationally oriented mathematical skills, to the intention to go on to tertiary studies involving some form of mathematics. It is expected that schools will construct courses according to the particular needs of these diverse groups of students. (Mathematics, p 21)

The curriculum ... is designed to encourage all students to continue their participation in Science education beyond the years in which it is required school subject. Many students with ability and interest in Science will further their Science education in the senior school. Some

will continue to study Science as an integrated subject, some will study specialist Science subjects, and others may do both. (Science, page 8, my emphasis)

ISSUES

Is the coherence of the curriculum sustained across the institutional phases (primary, middle, secondary)?

4.3 Content

The starting point for determining curriculum content has generally been the learning area or subject, and the result is often overcrowding[103]. Curriculum content within subject areas may be reduced because new areas and skills subjects have been added (ICT, citizenship, essential skills), because the ready availability of factual information has made the memorisation of facts largely redundant, and/or because the development of higher order skills (such as the processing, evaluation and communication of information), require different, and more time-consuming, learning strategies. However, whilst reduction in the content is seen by some, usually older, people as an indication of falling standards, teachers point out that `curriculum overload' undermines their ability to engage students in meaning-directed and independent learning.

The New Zealand Statements identify knowledge and skills but (with the exception of the `essential learnings about New Zealand' in Social Studies) do not prescribe content. It is up to teachers to develop suitable learning experiences to enable students to achieve the Achievement Objectives. Nevertheless, some teachers perceive the examples provided in the (Gazetted) Statements as compulsory.

ISSUES

Are students acquiring enough knowledge, or the right kind of knowledge?

Do `traditional' subjects and learning areas need to be revised to encourage better application and transfer of learning?

If learning becomes increasingly individualised, how does society ensure that `core knowledge' is transmitted to all young people?

4.4 Progression

This is mainly addressed in terms of the eight levels of Achievement Objectives, arguably the most problematic element of the curriculum.

There are some philosophical objections to outcomes-based curricula. Standaert (2001) suggests that systems based on obligations to meet standards-based results, top-down management and organisation of the curriculum, have not been very successful in the countries where this was introduced. `Success' is also a relative concept. Standaert argues that outcomes-based curricula tend to focus on short-term results rather than long-term education and on the extrinsic rather than intrinsic benefits of education. For example, whilst the (primary school) numeracy and literacy schemes did result in an increase in the number of English students achieving the targets, test results have shown that these same students have lower standards in some elements, namely spelling and punctuation, than their predecessors (Henry, 2002). Moreover, improvements have been achieved at the expense of breadth (with a reduced emphasis on the non-core subjects) and, in the view of Pullman (2002), enjoyment. He argues that the strategies ignore the real basics, namely `*the joy of discovery, the thrill we feel when an idea strikes that might become a story',* and that, faced with the pressure to achieve targets, `cheating' is a legitimate response.

Other critics (for example, Priestley, 1997; Elley, 1996) argue that the Achievement Objective levels are based on an unjustified assumption that all students follow the same linear learning sequence[104] and reach set levels by certain ages and ignore students' different rates of development in different subjects and contexts.

The New Zealand levels are based on Piagetian notions of development and, whilst there is a clear expectation of progression from simple to complex and from concrete to abstract[105], the Statements explicitly recognise that students develop at different rates, between and within curriculum areas and this range of development is reflected in the diagrams which indicate overlapping levels of achievement. The Arts Statement graphically demonstrates how each level embraces the learning of the preceding levels and others (for example, Technology) give examples of the way in which topics can be revisited to generate deeper understanding and learning, building on prior learning within and beyond the specific learning area.

However, the number of levels (eight for all learning areas) raises expectations of standardised achievement criteria, which are comparable between learning areas. This is difficult to deliver because of the differences between the nature of learning and knowledge force some artificial distinctions between levels. English and History indicators are difficult to define and subjective judgement is required to choose between the levels (Elley, 1996). In some cases, the search for descriptors at eight levels has led to minimal distinction between achievement at adjacent levels. Most importantly, the responsibility for converting Achievement Objectives to learning outcomes and learning experiences is delegated to teachers, resulting in lack of comparability between student grades. This may have been partly overcome by in-school moderation, exemplification materials and staff training, but Mansell's (1999) findings suggest that the strengths and limitations of Achievement Objectives as indicators of student progression needs to be clarified for parents and others.

The Achievement Objectives model appears to conflict with Maori culture insofar as

For Maori, a certain level of mastery is expected at each stage and learners must demonstrate that they are ready for each stage before they can progress to the next. This is a lifelong process and some things can only be approached at the evening of life; all learning depends on readiness. (Benton and Benton, 1995, page 15)

There are certain things that some people are never ready for; and there are degrees of specialisation, but the community is (through cooperation) able to lead an effective life by drawing on complementary skills and knowledge. The sharing of knowledge and skills by a group of people with different specialisations challenges the concept of individual qualifications.

ISSUES

How clear are the Achievement Objectives? How easy is it for teachers to interpret and apply them?

Given lack of national textbooks, year by year programmes of study and national testing, how similar is each school's curriculum? Students who change school often may experience a very disconnected curriculum.

If learning becomes increasingly individualised, against which criteria will individual progression and system performance be measured?

5. PEDAGOGY

`In education, it is not enough to describe content structures ... without addressing the question of how learning processes take place in pupils and what conditions are crucial to this. The key question is how learning can be stimulated, and how we can leave room for and

pay attention to the differences between children while doing this.' (Letschert 2001, page 282).

Students of all abilities can be helped to learn provided that the focus is not on the problematic character of [their individual] differences but rather on the individual possibilities of each child (Letschert, 2001, my emphasis).

Humans have a natural potential to adjust their behaviour and thinking according to the experiences they have in their lives; in other words, to learn. Formal education offers a structured process to facilitate and promote learning in prescribed areas and to a defined level (Lodewijks, 2001). However, the heterogeneity of societies and classrooms (with older, more sophisticated students), the expansion of knowledge, the unpredictability of future life and employment patterns[106] and a consumerist approach, all affect the perceived, and actual, effectiveness of schools. At the same time, technological developments open up alternative learning routes and methods.

Studies of learning and teaching have shown that passive, reproduction-based instruction does not help students achieve high quality, sustainable knowledge and understanding. Students need to experience and understand the potential practical value of their learning and realise that:

[The] quality of what people learn highly determines the way in which they are able to endure and participate in a world that is a continuous process of change. Learning is necessary, not only to take part in the world of work and adults, but also to be able to have a constructive individual impact, to be able to exert personal influence on the world of work and of everyday life. In the world of education an ever-increasing appeal is made to [qualities] such as independence, accuracy, learning ability, willingness to learn, flexibility, problem-solving skills, initiative skills, information processing skills and communicative skills. These are desirable also from a political-economic perspective, the importance of `developing people's ability to learn' (Nyhan, 1991).

An effective learning environment is one where schools give students explicit opportunities:

- to deal with the subject matter in a flexible, our goal oriented and adaptable manner (Perkins, 1987; Simons, 1990)
- to think about, use and apply their knowledge and skills in a range of identifiable contexts to make them tangible and meaningful (Brown and Campione 1990; Duffy *et al* 1993; Lodewijks, 2001)
- to learn how to learn (Maclure and Davies, 1991) and thereby to increase their learning ability (Shuell, 1988; Simons, 1990).

5.1 Recommended Approaches

Generally speaking, curricula do not prescribe teaching methodology. Indeed, one of the justifications for a statutory curriculum in Japan was that it released teachers to concentrate on teaching. However, the nature of curriculum documentation influences teaching method implicitly (through structure and content, assessment objectives, syllabuses and schemes of work[107], and other exemplification), and explicitly (through textbooks, guidance and some national strategies and other programmes intended to help teachers raise levels of literacy and numeracy).

Many revised curricula emphasise learning with understanding, but these intentions often compete with the scale of content, and the fact that most tests assess students' abilities to remember the facts. (Bransford*, et al,* 1999).

Alton-Lee and Nuthall describe the cumulative effect of learning on motivation. The more knowledge a student has, the more s/he participates and contributes, the greater his/her

contribution of knowledge to the common pool, the more s/he anticipates success in questions/tasks and the more s/he pursues information. The more tasks a student undertakes, the more questions/puzzles s/he finds (Alton-Lee and Nuthall, 1991, page 62) This finding argues for an active, rather than a receptive, approach to learning.

New Zealand

The New Zealand curriculum Statements recommend that teachers use a range of teaching strategies and learning opportunities to encourage all students to participate fully and to develop knowledge, understandings and skills, to strengthen personal identity and enhance a sense of self-worth. Examples include:

- learning about self-awareness, self-reflection, self-appraisal, and self-advocacy, and about personal characteristics, relationships, and contexts. (Health and Physical Education, page 37)
- flexible, open, collaborative approaches to classroom teaching, which accommodate all students' perspectives, interest, aspirations and communication and learning styles. (Technology)

The remainder of this section deals with learning approaches that are identified in the Statements under five broad headings:

- Reproduction-directed learning
- Application-directed learning
- Meaning-directed learning
- Collaborative learning
- Metacognition.

5.2 Reproduction-directed Learning

This is the lowest order of the learning approaches described by Vermunt (1992). Students who are mainly motivated by the test and/or the diploma, tend to choose his method. Their goal is to memorise and reproduce information as near as possible to the original form. Learning is dominated by dividing the content into parts, and imprinting these in their minds by repetition. The transfer value and the sustainability of the acquired knowledge and skills are limited, and can only be applied in a restricted domain.

However, it should be recognised that reproduction learning should not be wholly dismissed as it can be an important component of the learning repertoire. It is sometimes the most efficient way of learning aspects, which can subsequently be further explored, applied and tested.[108]

Whilst there is no reference to *instruction* (common in USA), this teaching style may well be adopted by those who perceive the Achievement Objectives as a list of learning to be `covered'.

5.3 Application-directed Learning

Concrete, or application-directed, learning activities (Vermunt, 1992) are at an intermediate level and consist mainly of making concrete and applying the acquired knowledge and skills. It is integrated with the person and connected with specific contexts in which they can function. The sustainability and transfer values are higher, because they extend to situations and circumstances outside the immediate reach of the learning and test situation.

A sub-set of this model is cognitive processing. This is content-oriented and involves collecting, working out and processing the information. It contributes to knowledge increase,

integration of knowledge and skills, by establishing relationships between different parts of the subject and between recently acquired and pre-existing knowledge, with respect to the use and application of acquired knowledge insights and skills. Cognitive processing activities are aimed at facts, procedures, concepts, and principles. (Lodewijks, 2001)

Relevant approaches recommended in the Statements include:

- Authentic context, including learning outside the classroom[109]
- Transfer[110]

5.4 Meaning-directed Learning

In meaning-directed learning, the highest order model, students take charge of their own learning. They are motivated by personal interest, pursuit of deeper insight and personally integrated knowledge constructions. Such learning is characterised by the application of processing activities which compare, contrast and critically analyse the relationships between different parts, between the parts and the whole, between the main features, and between new information and their own previously acquired knowledge or preconceptions. Students try to understand the perspectives of the authors, teachers and fellow ex-students, in order to develop a personal opinion and to use this as a basis to change something about the information (Vermunt, 1992). Knowledge is not a given, to be passively received, but rather negotiated in relation to personal thinking and opinions (Spiro *et al*, 1991). Students perform integrating and constructive learning activities by engaging in a more or less continuous interaction with the resources, and systematically relating their contents to prior learning, to their personal conception of it, to its potential for use and application in different circumstances, including innovative uses, and so forth. In this way, the new learning becomes an integral part of the students' knowledge base. Interactive construction and integration of information and knowledge lead to deeper and more flexible insights, maximum versatility and a high transfer value (Simons, 1990) and therefore to multi-functional learning results (Spiro *et al,* 1991). High quality learning leads to expert behaviour which increases the possibilities for the individual to cope in a variety of situations It can only be achieved if the student is prepared, ready and allowed to perform learning activities aimed at processing and integrating what has been learnt.

Constructivist learning, described as the continual revision and consolidation of previous learning, is recommended in most Statements, for example English, Mathematics, Social Studies, Science and Technology. Research conducted from a constructivist perspective defines understanding as the outcome of meaningful learning (Driver *et al,* 1985; Osborne and Freyberg, 1985). The learning is meaningful to the individual and the understanding is personal.

However, Clark (1996/7) rejects constructivist learning in Science on the grounds that it is `*philosophically naïve, and wilfully ignores (or is ignorant of) two thousand years of philosophical debate on the issues it takes for granted*'. Whilst supporting the approach, Burns (1997) argues that the Statement neither defines the development of scientific `understanding' (Science Statement, page 15) nor explains how it may be achieved. Assessment activities (describing, selecting, carrying out tests, recording, charting, results, writing reports, explaining) are proposed, but without indication of how they assess understanding.

Related approaches include:

- Active learning (the Arts, Science and Mathematics)[111]
- Comparison [112]
- Creativity (e.g. Mathematics)[113]
- Integrated learning is specifically recommended in Science, Social Studies and Technology
- Open-ended learning (e.g. Technology)[114]

- Problem-solving (e.g. the Arts, English, Science)
- Critical thinking
- Reflection (e.g. the Arts, English, Science, Social Studies)

Problem solving is seen as the most appropriate way forward in a world where there are few single, permanent solutions, and where students need the flexibility and capacity for critical thinking to identify problems, explore and appraise `solutions', implement them and evaluate them according to a range of criteria, including unintended effects. This is an important feature in Statements - especially in Technology - and a good basis for independent learning, and lifelong learning.

Whilst examples of observation, analysis and, to a lesser extent, application of learning are found in all Statements, opportunities to explore and express personal responses - especially those relating to feelings - are more restricted (for example, in the Arts and English). Opportunities for self-directed learning, where students pursue their own interests are bounded[115] and tend to be offered to those students who have already covered the basics required by the Achievement Objectives (as in the Mathematics Development Band).[116]

The Arts, English, Health and Physical Education, Science and Technology provide examples of themes that can be revisited by students at different levels of development, creating a spiral or iterative curriculum. *The spiral nature of learning in health education and physical education means that key areas of learning will need to be revisited at different levels and in different learning contexts* (Health and Physical Education page 35)**.** However, it is important to be clear about the differences in performance required for successive levels to avoid the danger that `revisiting' might simply become `repeating'.

5.5 Collaborative Learning

The benefits of collaborative learning extend beyond the achievement of the learning task into the development of inter- and intra-personal skills and enjoyment. Research and practice show that participation, co-determination and social interaction in class and in school life are performance-enhancing elements that help to motivate and to understand the usefulness and value of effort and work. (Oser, *et al* 1992; Schirp, 1992 and 1999).

Vygotsky (1962) points out that peer dialogue is a cooperative exchange of ideas between equals and therefore emulates several crucial features of rational thinking. Children (a) have a common vocabulary (b) find feedback from other children less threatening and take it seriously (c) speak directly and openly to each other. Schirp endorses this, as follows:

Much of what students note and describe as results is of interest to other classes and may be further processed, critically studied and supplemented. Students experience things in a way which makes their results useful to other groups. They get (critical) feedback from other groups, which stimulate new ways of looking at things. This leads to forms of social cooperation ... and positive changes in school climate. Discussions in peer group context take place at a level of concreteness understood by most participants - pupil adapted, common living circumstances create a common background of experience- positions, interpretation and argumentation more comprehensible (Schirp, 2001, page 141)

These approaches are recommended in all the learning areas of the New Zealand curriculum[117]. That collaboration can transcend the classroom time and place is indicated, for example, in the identification of `expert sources' and practitioners outside the school (Arts, Science, Technology) and the proposal that senior Science students disseminate their findings through seminars and submissions to scientific journals.

5.6 Metacognition

Metacognition encourages students to examine how they deal with the subject matter and thus improve their learning effectiveness. Vermunt (1992) identifies `regulation activities' which keep the learner in an optimal frame of mind. Examples include preparation for learning, orientation, planning activities, choosing and establishing objectives and formulation of criteria; monitoring and assessment of progress (process and outcome), diagnosing and adjusting the approach and objectives in the light of problems experienced; evaluation of the learning process and associated the activities. This also includes affective processing activities, that is, ways in which students regulate and overcome feelings (such as tension) which reduce the quality of their learning. By identifying learning stages and processes, metacognition enables students to develop their own scaffolding strategies.

ISSUES

To what extent can the curriculum accommodate the full range of learning styles so as to promote optimum learning by all students?

Is there a tension between the amount of learning implied in the Achievement Objectives and flexibility to introduce a range of learning experiences, and exploit students' interests and experiences in the classroom?

6. IMPLEMENTATION

This critique does not extend to the implementation of the curriculum. However, there are a number of issues that affect the consonance between intention and implementation, especially in relation to the extent of change from preceding curriculum models:

6.1 Regulation

The fact that the Statements are Gazetted documents may lead to differences in interpretation concerning their status. Whilst only the Achievement Outcomes (and the essential learnings in Social Studies) are compulsory, the inclusion of examples and guidelines in Gazetted documents may cause some teachers and others to interpret these as having a similar, prescriptive, status. When the compulsory curriculum was first introduced in England, teachers were inclined to treat the documents as checklists. This approach was reinforced by the requirements to document learning against targets of attainment and the interpretation of OFSTED inspectors. As staff development and supporting materials came on stream, the curriculum documents provided a useful basis and language for understanding, planning and charting student learning experiences and progression, and teachers developed confidence to adapt their own experience to the curriculum requirements. As professional understanding and expectation have evolved, there is less need for prescription. A similar situation may arise in New Zealand.

ISSUES

To what extent is there a common understanding between teachers and other educators concerning the requirements/expectations of the New Zealand Curriculum?

To what extent do students, parents and others in the community share this understanding?

Should the materials in the Statements be separated into compulsory and supportive elements?

6.2 Standards

Given that teachers and schools have responsibility for converting Achievement Objectives into learning outcomes and learning experiences, it is likely that Achievement Objectives are

differently interpreted and applied. The provision of exemplars and training will contribute to a consistent implementation.

ISSUES

How easy is it for teachers to convert the intentions and Achievement Objectives into learning experiences? Do problems arise for teachers who feel pressured to `cover' the curriculum, and/or who lack specialist subject knowledge? Could/does the Ministry give more detailed guidance, exemplification materials or training to support teachers, especially in relation to the Achievement Objectives?

How is the consistency of interpretation monitored and supported?

How is confidence promoted in the community?

6.3 Pedagogy

As indicated above, the inclusion of specific outcomes, across a wide range of subjects, undermined the confidence of some teachers and led them to use the National Curriculum as an audit checklist. Some reverted to a more didactic teaching style.

ISSUES

What steps are taken to ensure that an explicitly outcomes-based curriculum has not narrowed the focus of teaching and learning, and the range of educational experiences offered to students?

How well are teachers prepared (competent/confident) to embrace the range of teaching strategies required to stimulate independent learning?

6.4 Feasibility

The implementation of any policy, especially one as wide-ranging as the curriculum, represents an increase in workload as teachers familiarise themselves with the requirements, adapt their teaching and assessment methods and develop teaching materials. Teachers in small schools or departments have to shoulder a disproportionate burden, and primary school teachers are under greatest pressure as they have to deal with all curriculum areas.

Mansell (1999) found that, in New Zealand, the increased workload was considerable because of the extent of change from the preceding curricula, the rate of change and the recording and reporting requirements. Mansell reported that, although the consistent form of successive Statements, and the availability over time of textbooks and other resources have supported the implementation, teachers felt that policy makers and administrators did not acknowledge the amount of work required and failed to provide adequate training opportunities. In some cases this was due to resource constraints (to provide cover for teachers undergoing training) whilst in others, training demands competed with school and teaching commitments.

ISSUES

The statutory areas provide for an entitlement curriculum, but the implementation turns it into a reality. Is the curriculum universally implemented (Technology in secondary, Science in primary?) and are the necessary conditions (space, materials, qualified and supported teachers) in place?

How feasible is the implementation of the curriculum, in terms of workload?

To what extent is collaboration between teachers in different learning areas possible within the school day?

To what extent does school/classroom organisation facilitate or restrict the teacher's ability to support students outside the level of the majority?

To what extent does the availability of computer programmes and on-line materials determine what is taught and how? Who monitors content and quality?[118]

How easy is this to provide ethnic and gender role models?

7. CONCLUSIONS AND RECOMMENDATIONS

Any prescribed curriculum reflects and reinforces the values of those who design/enforce it, and inevitably raises questions from those who consider that their perspective and needs have been ignored (Bates 1991).

The New Zealand Curriculum (as described in the eight documents) seeks to meet the, sometimes conflicting, expectations of a wide range of stakeholders and provide a balance between the interest of individual students and the requirements of society and economy. In common with many other curricula, it is increasingly subject to pressures to demonstrate its effectiveness in terms of student learning outcomes. It has therefore incorporated elements of all the main models outlined in Section 2, and offers opportunities for fulfilling the range of functions to different degrees.

However, the extent to which the intentions can be achieved depends on the support and encouragement provided, in terms of structure, resources, and staff development. A further major influence is the way in which student assessment and institutional evaluation develop over time. Experience elsewhere shows that the higher the assessment/evaluation stakes, the greater the focus on `borderline' or `bread and butter' students, whose progression into the next attainment category has the greatest effects on the schools' standing in terms of the `league tables' (Fitz-Gibbon, 1997).

The principles espoused in the curriculum documents reflect both New Zealand's uniqueness (in terms of its bicultural heritage) and its similarity to other countries in terms of the challenges it faces in reconciling individual, political, social, economic and cultural demands. There is a high degree of coherence between the Framework and the subsequent Statements, with two important exceptions:

- the relatively low priority given to foreign language learning, which remains a non-statutory requirement (*see 3.2 above*)
- the failure to follow through on the commitment to meet the needs of students of different social and religious backgrounds (*see 3.8.4 above*)

In addition, a tension arises between two principles: the recognition of the rights and needs of the Maori community and those of other ethnic groups. This tension is apparent not only in the inclusion statements but also in the representation (or lack of it) of the language, culture, context and learning styles of the different ethnic groups.

Research shows that, during the past 10-15 years, most initiatives have not been implemented as intended, or at all, even if the school or department accepted the innovation (van den Akker. 1988, 1998). `*Apparent acceptance of innovation or even the use of a new curriculum or teaching package does not automatically lead to the intended national change*' (Letschert p 175). Some issues relating to implementation have been raised in the previous section. However, whilst policy is made and carried through, circumstances change. In the same way, as policy is implemented, the initial sharp reactions become more muted, as people become familiar and deal with the reality instead of the fear.

The following recommendation is made to:

- promote a clear understanding of the curriculum intentions
- secure commitment to their implementation and evaluation
- explore the continuing appropriateness of the curriculum to New Zealand's needs.

RECOMMENDATION

Consideration should be given to the declaration of a moratorium on curriculum change, to enable schools to incorporate all seven Statements into their school curriculum in partnership with education agencies and the wider community

The respite from change will enable all those involved to implement, trial and evaluate the curriculum and supportive materials and identify improvements for consideration for a revised version. During the moratorium, the following might be considered.

What is the rationale for the curriculum?

Is it primarily to help or enable teachers to provide good quality learning experiences for their students?

Is it intended as a means of identifying and recording student achievements?

Is it intended as a means of monitoring and recording what teachers do in classrooms? Does the curriculum in its present form fulfil these functions?

Are the curriculum requirements and expectations clear and consistently applied?

Consideration should be given to dividing the curriculum documentation into *prescription* (principles and system requirements) and *support* materials (guidelines, exemplification and source materials), of which only the former would be Gazetted. This would clarify the distinction and allow the support materials to be revised, amended and complemented more easily and informally. This would also promote the flexible implementation of the curriculum to meet local needs and circumstances.

Consideration should also be given to ensuring that the curriculum intentions and requirements are clear to all partners in the education service to reduce the risk of inconsistent and conflicting interpretations which may result in inequalities in both the nature of provision and the reporting of student achievements.

It may be helpful to review the documents in terms of terminology and presentation, to facilitate their use, especially by primary teachers, who have to work with all seven documents.

The discrepancy between the learning area and the titles of Curriculum Statements should be eliminated by changing the title of the document to reflect the language concerned: Language and Languages in the New Zealand Curriculum: English, (te reo Maori, Mandarin etc)

Are the principles, and the relationship between them, consistent?

Reference has been made to the conflict in implementing the curriculum's commitment to the multi-cultural community, without undermining respect for New Zealand's bicultural heritage. The assumption underlying this recommendation is that respect for the multi-cultural community is important for all - regardless of the proportions of the ethnic groups represented in individual schools. Secondly, the analysis of the curriculum Statements and the preparation of appropriate support materials by individual schools are daunting tasks. The workload could

be significantly diminished if carried out by one or more groups on a national/regional basis. Representatives from different ethnic/cultural groups should be involved, so as to:

- highlight any incompatibilities in perspectives and values which need to be taken into consideration[119]
- identify the ways in which the multi-cultural dimension can be appropriately reflected
- help teachers to develop, or identify sources of, suitable teaching and learning materials.

However, the creation of `standard' or `agreed' perceptions of different cultures carries the risk of ignoring `*diversity of individual students within particular cultures*' on the one hand, and the evolution of culture over time and across generations on the other.[120]

Are students learning what we, and they, consider necessary?

Are they are becoming `*more competent, more able to adjust to an cope with living in our complex society, more capable of practical problem-solving, increasingly able to find a satisfying quality to their lives?*' (Gagné, 1977).

To what extent are students' expectations and interests taken into consideration in planning content and teaching methods?

Reference has already been made to the discrepancy between the principle of foreign language learning and its enactment. This does not necessarily require full-scale courses in every language. Consideration should be given to building on New Zealand's bilingual culture to motivate and support students to learn further languages at school and beyond. Taster courses could help students identify and develop generic and specific language learning skills, which could be developed in intensive courses at school or subsequently.

How can transfer between learning areas, and essential skills, be enhanced

Consideration should be given to setting up multi-disciplinary teams to map the common themes between learning areas and essential skills, so that teachers are fully aware of the potential for cross-reference, transfer and reinforcement, thereby avoiding mere `repetition'.

How can continuity and progression be enhanced and facilitated?

The link between pre-compulsory, compulsory and post-compulsory education should be made more explicit. This is essential to build on the groundwork of *Te Whariki* and to facilitate the transition to post-compulsory education, in particular from integrated learning areas to individual subject disciplines (for example, in science and the social sciences).

Although the Achievement Objectives provide a basis for planning student learning, there is a risk that they may constrain the range of teaching methodologies. More importantly, as they are currently formulated, the Achievement Objectives do not provide an adequate basis for objectively measuring, and reporting student progress in a way that is meaningful to the wide target audience.

Given that the Achievement Objectives constitute virtually the sole element of regulation, attention needs to be given to their reformulation so that their intention and their significance are clear to those involved.

The supportive documentation addresses this problem by indicating links between learning experiences, learning outcomes and Achievement Objectives. It is expected that staff development also contributes to a more consistent understanding of the characteristics of different levels of performance. A revision based on these experiences should overcome

some of the problems. In the meantime, new entrants to the profession will be familiar with the requirements.

How can the range of pedagogies, currently recommended for special groups, be implemented to enhance the learning of all students?

Some strategies, currently mentioned in the context of specific groups, could contribute the better learning by all students whilst reducing the risk of stereotyping and labelling that they currently entail. Examples include:

- the consideration of background and culture, as advised for Maori students
- using `alternative means of expression' to re-present information with a view to increasing understanding and allowing students to do the same, to demonstrate their learning (Arts)
- so-called `Maori' learning styles (collaborative working, oral expression etc)
- cross-reference between learning areas recommended for ESL students (English)
- development band activities (for the more able in Mathematics)
- iterative processes (Technology)
- `open-ended activities which encourage imaginative and creative thinking and lateral exploration of ideas' (Science).
- assessment approaches recommended for Maori students (oral, group work) may benefit ALL students.

Are teachers adequately supported to implement the curriculum?

Whilst recognising that some of the demands involved in implementing a new curriculum will diminish over time, as teachers become familiar with the requirements and supportive materials, consideration should be given to providing further support in terms of exemplification and staff development**. This is particularly important in relation to the Achievement Objectives.**

How have New Zealand's needs changed since 1992?

For example, information and communication technologies have increased the power of the `knowledge economy'. Two approaches can be characterised by the US model (narrowly focused on economic benefits whilst saying little about their polarised distribution) and the Scandinavian model (founded on a proposition about social inclusion, the idea of knowledge-rich citizens and a knowledge-rich society). What are the consequences of the curriculum and teaching methods for New Zealand's `knowledge economy'?

Is there scope for less prescription in the next version?

Experience in England suggests that, by consolidating teachers' understandings of how their existing practice can contribute to, and be reviewed to meet, the objectives, content, pedagogies and assessment of student achievement of the Curriculum, it has been possible to reduce the level of prescription in subsequent versions.

A curriculum that is less dependent on prescription through documentation has the potential to respond more flexibly to local needs and changes over time. It also allows for some negotiation of the curriculum with students, a factor which has been shown to increase motivation.

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APPENDIX 1

NATIONAL FOUNDATION FOR EDUCATIONAL RESEARCH

The National Foundation for Educational Research (NFER) is the largest independent body specialising in educational research in the UK. It has a membership of all the local education authorities (LEAs) in England and Wales and the major professional associations. Its varied portfolio of work consists of three major strands:

- projects sponsored by a wide range of external agencies, including the Department for Education and Skills (DfES);
- projects funded by its LGA (Local Government Association) members, according to their identified needs and priorities;
- internal projects, usually small-scale and/or pilot studies, which attempt to break new ground in order to build the foundation's capacity for further sponsored work.

The NFER conducts its work impartially and professionally, as part of its overall aim of improving education and training. Through sponsored research and other services it has built a reputation for understanding and meeting the particular needs of government sponsors, in particular in handling confidential or sensitive information, and in working on high profile projects which require continual close liaison with the relevant staff.

The NFER has built up a very wide range of expertise in the fields of evaluation, assessment and statistical analysis; it has specialist services to support all the major approaches used in educational research. Staff development levels are high and the NFER has Investor in People status, in recognition of its commitment to this area.

The NFER has well-established procedures to exercise close managerial and fiscal control over all its projects. The main features include regular project review and development meetings, careful selection and continuing development of staff according to the needs of the project, internal scrutiny of reports and other forms of dissemination. Research instruments are subject to a range of checks at all stages from design to analysis.

THE COMMENTATOR

A national of the Netherlands, Dr Joanna Le Métais has been educated in the Netherlands, Australia, France and England. She is a qualified teacher and holds a Bachelor of Education, a Master of Arts (Public and Social Administration) and a Doctor of Philosophy (*Conservative values and education policy 1979-1990)*. She was awarded the degree of Doctor of Education *honoris causa,* from Brunel University in 2000.

Dr Le Métais is Head of International Project Development at the National Foundation for Educational Research. Her main area of work is comparative analysis and evaluation of education policy, implementation and reform. She directs *INCA*, the International Review of Curriculum and Assessment Frameworks, an ongoing study of education systems and organisation in 18 countries, sponsored by the Qualifications and Curriculum Authority.[121] This work is further enriched by her leadership of the World Bank review of primary curriculum reform in Vietnam,[122] and an analysis of the curricula in England, Wales, Northern Ireland and Scotland for the British Broadcasting Corporation.[123] In 1999-2000, she conducted a review of educational continuity between England and selected locations in Australia, Canada, New Zealand and the USA for the Foreign and Commonwealth Office.[124] She is currently conducting an *INCA* thematic study on upper secondary education.[125]

Dr Le Métais' previous work experience includes teaching, school management, local education authority administration, examining, research, and quality assessment in higher education. She has undertaken advisory assignments, research projects and service activities in a number of countries including Australia, Canada, Finland, France, Germany, Japan, the Netherlands, New Zealand, Mexico, Norway, the Russian Federation, Spain, Vietnam and the USA. She is the author of numerous research-based publications and conference presentations on education policy and provision, the training and management of teachers, and specific aspects of teaching and learning.

1 See http://www.tki.org.nz/r/stocktake/issues/index_e.php

2 New Zealand. Ministry of Education. (2000) Literature Review - Published Critiques and Commentary on the New Zealand Curriculum

3 Ministry of Education interview, NFER 4 December 2001.

4 For example, the two issues of *Delta* dedicated to the New Zealand curriculum, namely Volume 48 No. 2, (1996) and Volume 49, No. 1. (1997). *See also bibliography/references.*

5 Ministry of Education interview, NFER 4 December 2001.

6 Characterised by Achievement Objectives, attainment targets, indicators and benchmarks.

7 Although separate education systems exist in England, Northern Ireland, Scotland and Wales, all are based on an outcome model.

8 See Elley 1996, for limitations.

9 For example, Governing Bodies in England, School Boards in Australia and New Zealand.

10 The theoretical likelihood of student mobility has increased as parental choice replaced student allocation to schools by catchment area.

11 For example, South Australia, New South Wales, Ontario (Canada), England, France.

12 Successive governments in England have mandated the publication of assessment results in school brochures, and provide school performance tables on government websites, to inform parental choice of schools. The resulting publication by the media of `league tables' is endorsed by government as a means of allowing the market to `drive up standards'. In contrast, the French government prohibits the publication of school assessment results (other than those relating to the *baccalauréat*), as the information is intended to inform teachers' work. Most recently, Saxony is Germany has published results of the *Abitur* (18+ examination) in the hope that the resulting inter-school rivalry will improve the performance of the weakest (Sharma, 2002).

13 Programme for International Student Assessment, see OECD (2001): Canada, Australia and the UK tend to perform above the OECD average and Germany, Switzerland and, to a lesser extent, the USA doing slightly less well than the OECD average. However, these results may be due to the tendency in Germany and Switzerland to group students according to ability. - see 2.3 below.

14 Curriculum 2000, introduced following the five-year review of the curriculum (England). The review of the core curriculum for lower secondary students *Basisvorming,* has led to greater flexibility for schools. (The Netherlands). As part of the move towards student-centred learning, intended to develop creativity and divergent thinking, curriculum content has been reduced (Singapore, *see* Le Métais *et al* 2000). The reforms of the LOGSE Law, phased in throughout the 1990s, have introduced a curriculum framework, the details of which are determined at regional and school level. (Spain)

15 Defined as those with favourable results in National Curriculum assessments at age 7, 11 and 14 and public examinations at 16+.

16 For example, in France, Spain and, to a large extent, England, where only 160 of the 3170 secondary schools are designated as selective schools.

17 The state has offered incentives to schools which amalgamate to form `school communities' catering, for students of all abilities, albeit in different tracks or sections. Note that although the state funds schools, they are `owned' and operated by municipal, religious or other bodies and the state cannot force their amalgamation.

18 For example, in Singapore, there are separate routes allowing GCE O Level examinations to be taken after four or five years respectively.

19 For example, http://www.nc.uk.net.gt/

20 For example, Australia, Canada, England, Korea, USA. In Italy, post-compulsory education (for students over 15) is offered in separate schools according to the discipline studied, that is the humanities, Sciences, fine Arts, Technology etc.

21 The aim is to enable schools to profile themselves in the educational market-place and to enable students to increase their the level of knowledge and skills in their chosen area. This approach also recognises that schools cannot afford to maintain expensive specialist equipment in all subject areas.

22 Programme for International Student Assessment, see OECD (2001).

23 See http://www.pisa.oecd.org/knowledge/summary/g.htm

24 Explanation of curriculum according to its intended purpose rather than their causes. See Taba (1962), cited in Fry, 1985, p. 5.

25 See the National Curriculum 5-16 documents. DfEE and QCA 1999, and 1999a.

26 For example, TIMSS (the Third International Mathematics and Science Survey conducted under the auspices of the IEA) and PISA (the UNESCO Programme for International Student Assessment).

27 Even if the complexities of producing survey instruments in different languages and for different cultural contexts can be overcome, assessment items may not be in line with national educational priorities or programmes. Thus, results may be irrelevant as an indicator of student and system performance.

28 Employers and higher education institutions almost universally complain about students' knowledge and skills are inadequate.

29 For example, the `back to basics' movement in the USA has gained ground, and in England, the government has introduced national strategies and set targets to ensure that literacy (from 1998) and numeracy (from 1999) are given priority in primary schools. As a result, less time is available for the other curriculum areas. Similar initiatives have also been adopted in Australia.

30 *See, for example, Mansell, 1999, and Bates, 1991.*

31 These generally include numeracy/application of mathematics; literacy/communication; information (Technology) skills; interpersonal skills; problem solving, critical/logical thinking and decision making; study skills, self-evaluation and improvement; citizenship/civic responsibilities; competence in more than one language. Preparation for lifelong learning; awareness of and preparation for the world of work, employment and entrepreneurial skills; creativity, creative thinking/imagination.

32 This can be problematic as some employers consider that the traditional values of respect, obeisance and conformity are no longer `appropriate' and seek evidence of interpersonal skills, individual initiative and creativity.

33 A recent online survey in Europe and beyond, revealed a growing awareness that professional development in this area must extend beyond ICT skills, and emphasise pedagogical and management skills relevant to the delivery of `e-learning'.

See http://www2.trainingvillage.gr/etv/elearning/surveys/surmain.asp

34 For example, keyboard skills and using applications to retrieve information, and process and present text, data, and visual information.

35 As not all sectors of the community have access to the necessary resources, there is a risk that some may become marginalised. Can schools (be expected to) compensate for this?

36 Promoting competition, consumerism, individualism, choice, through the mechanisms of diversity, privatisation and the publication of examination results by school e.g. in England, France, the Netherlands. It is argued that this replaces the developmental and collegial culture in schools with managerialism and bureaucracy, focuses on quality control, efficiency and data collection. *See Cohen et al 1996.* Robinson, 1997 (in Letschert page 208) found that increased recruitment favourably influences the achievement of all students in the school, even those from poorer environments. Balanced and `full' school intakes therefore contribute to better educational outcomes.

37 See: Bates 1991, Lyotard 1993 pointed to the `anti-social/anti-community effects of autonomous choice'.

38 Increasingly, governments involve business and other community representatives in the formulation of education policy and the governance of schools in Australia, Canada, England, New Zealand, the USA. In England, the law requires that school inspection teams include a lay inspector.

39 Letschert (2001) refers to incidents where parents sought, and in some cases obtained, legal redress for the `lack of quality' of they education their child(ren) received.

40 For example, Australia (from 2000), England (from 2002), France, Germany, Hungary, Ireland, Korea, the Netherlands, New Zealand, Singapore and USA offer character education, moral education or civics/citizenship education alone, or across the curriculum. See also religious education below, and: SLO 2000 conference; IEA 2001.

41 For example, Japan, Korea and Singapore.

42 For example, England, Germany, Italy, Spain, although students may be excused on grounds of conscience.

43 For example, through the Standing Advisory Councils for Religious Education in England.

44 For example, in France, New Zealand and the USA.

45 For example Australia, Belgium, Canada, England. In the Netherlands, faith schools comprise some 60 per cent of all schools. Whilst faith schools in England are seen as effective, proposals to increase their number are resisted by those who fear lest segregation increase ethnic/religious tensions in the community.

46 See, for example, Letschert J. (2001) page 271.

47 Matthew 25: 29 to those who have, more will be given... but for those who have little, even that which they have will be taken away.

48 GREAT BRITAIN. PARLIAMENT. HOUSE OF COMMONS (1978).

49 Adelmund (2000) found that 28 per cent of primary students in the Netherlands belong to the target group of the special needs policy. Of these 55 per cent are from deprived backgrounds and the remaining 45 per cent are of non-Dutch origin.

50 *e.g. `... critically analyse the ways in which some existing concepts of masculinity and femininity may have a detrimental effect on the health and physical activity patterns of boys and girls, men and women.' `... challenge gender stereotyping and discrimination' `...Provide role models for both girls and boys of men and women were encouraging, sensitive, tolerant, assertive, and physically active'*

51 For example, the roles of men and women as active or passive participants in the Arts and the ways in which their contributions are recorded over time.

52 The Arts, English, Health and Physical Education (Health and Physical Education), Mathematics, Science, Social Studies and Technology.

53 The curriculum statements are complemented by the national education goals, which are part of the regulations. However, NEGs and NAGs fall outside the remit of this study.

54 Te reo Maori is addressed in a parallel document.

55 English Statement, upper secondary.

56 For example, some secondary schools have not fully implemented the Technology curriculum. (Ministry of Education interview, 2001, Slough November 2001)

57 For example, in the Arts, Developing Practical Knowledge, the difference in expectation between level 1 and level 2 is limited to an additional requirement to `identify': *Level 1: Students will explore elements and principles of the visual Arts, using a variety of techniques, tools, materials, and processes, and procedures. Level 2: Students will identify and explore elements and principles of the visual Arts, using a variety of techniques, tools, materials, and processes, and procedures.* (Arts)

58 The proposals for assessment at Transition Points have been superseded and other initiatives For example, assessment resource banks, exemplars, are due to be implemented.

59 For example: The learning and assessment experiences outlined are merely suggestions and are neither exhaustive nor definitive. (Technology, page 24).

60 Examples include: Making Sense of the Physical World, Building Science Concepts: Soil Animals; Structures and Mechanisms; The New Zealand Wars; The Curriculum in Action: Choice Food and Everybody Belongs.

61 `*... enjoyment, breadth, and writing of reading in different literary genres, such as drama, fiction, and poetry.* (English); *students should `exercise with enjoyment'* and `*Students who are involved in competitive activities should be encouraged to strive for and enjoy personal and group achievements* ...' (Health and Physical Education, page 43)`*... having access to people who can fulfil an interim role when students are undertaking technological activities can increase enjoyment, participation, and success'.* (Technology, page 17)/

62 `It is axiomatic in this curriculum statement that mathematics is for all students regardless of ability, background, gender, or ethnicity.' (Mathematics Statement, page12) `*All students have the right, and therefore should have the opportunity, to achieve in Technology. All students are able to participate successfully, individually, and in groups in Technological Activities at their own levels of ability*.' (Technology Statements page 7).

63 `*All resources used should be critically reviewed to ensure that they support gender inclusive, non-racist, and non discriminatory programs'* Technology curriculum and elsewhere.

64 `*Dance, drama, music, and the visual Arts enable ideas and emotions to be expressed in ways alternative to conventional means of communication. Through involvement in the Arts disciplines, all students can develop ideas, initiate interactions, and express and share their feelings*.' (Arts)

65 The publication of the other Statements predated these Guidelines.

66 `*Students with exceptional ability in mathematics must be extended and not simply expected to repeat different permutations of work they have already mastered.*' Mathematics Statement page 12.

67 `*Allowing students to select the topic or contents or to set their own goals; allowing the opportunity for individual an independent study, perhaps using a contract plan; encouraging access to a broader range of high-level resources*.' Mathematics Statement Page 19.

68 `*Both boys and girls are disadvantaged by the ways in which oral, written, and visual language can create, reflect, and reinforce gender stereotyping*.' English Statement page 13.

69 For example: `*Girls can, and do, achieve in Science but once they have the choice, many decide not to participate in Science courses or seek Science-based careers. Many girls view much of school Science as outside their life experience and see little used for scientific knowledge and understanding in the future lives. ...Science education often undervalues the contribution of girls, provides unfamiliar contexts for their learning, and fails to develop their confidence in pursuing studies in the area*.' Science Statement page 11-12.

70 For example, Mathematics Statement page 12 and Science Statement page 11-12.

71 For example: `*Programmes must be planned so that Maori students are able to achieve confidence and excellence in English. The achievement in English of Maori students will be enhanced when teachers are knowledgeable about Maori culture and when Maori knowledge is affirmed and respected in the classroom...The growth of Maori medium classes (bilingual programmes, total immersion programmes, and kura kaupapa Maori) has considerable implications for the English curriculum. Teachers need to be aware that some Maori students - particularly those in bilingual classes - may have to meet to set of cultural expectations. This has implications for bilingual teachers, who need to maintain the balance between the English curriculum and the Maori curriculum (te marautanga Maori)...'.* (English Statement page 14).

72 `*Central to the growth and development of kura kaupapa Maori is the need for Maori students first of all to develop a secure base in their own language and culture. Students in kura kaupapa Maori are expected to be fluent in spoken and written Maori before the study of English begins*.... "*For the children, let there be two languages. First language of the ancestors, second the language of the sectors. Let the growth of each language be equal, so that the children stand strong in the Maori world and in the world of the settlers." '* (English Statement page 14)

73 Examples where Maori language indicates the composition of a number: 24 = two tens and four `*Say or read, in English and Maori, two-digit numbers'* (Mathematics Statement page 34). Maori terminology used for health and well-being (*hauora*) and several concepts in Health and Physical Education (page 34) are Maori terms. For example: `*learn Science through the medium of te reo Maori and use a wide range of resources in te reo Maori... Acknowledging tikanga Maori and valuing the use of Maori language and the experiences of Maori students, affirms their identity and creates a positive learning environment*.' (Science)

74 For example: `*It is particularly important that mathematical learning experiences for Maori students acknowledge the background experiences which have led to the formation of ideas and skills which the students already have. Maori students will be helped to achieve if teachers it knowledge and value those ideas and experiences*.' (Mathematics page 12); `*Education for Maori students will be further enhanced through the medium of te reo Maori, and by including technological activities based on Maori developments and applications*.' Suggestions include: Hangi, Maori weaving. (Technology)

75 For example: `*learn Science which acknowledges and values Maori scientific knowledge (use of waves for navigation; fire, oars); develop scientific concepts within Maori contexts (Maori planting calendar, Maori medicinal plants; heating a hangi; food preservation)*' (Science) For example: `*In recognising New Zealand's unique bi-cultural heritage, physical*

activity embraces nga mahi a rehia Maori recreational and leisure activities including te reo kori. These activities are a unique to Aotearoa New Zealand knowledge, traditions, and movements skills from the past along with adapted contemporary movements.' (Health and Physical Education, page 42).

76 For example: `*Traditional time constrained pencil and paper tests have proved unreliable indicators of Maori achievement in the past. Sample assessment activities, include procedures suggested which may be more appropriate for assessing Maori Students*.' Mathematics Statement page 12; For example: `*Teachers in, for example bilingual Kura Kaupapa Maori may choose to: offer mathematics in contexts which provide quite different activities and experiences'* (Mathematics Statement page 18) `... *design and use alternative methods to assess students' progress towards the Achievement Objectives'*. Mathematics Statement page 19; For example: `*Use their preferred learning and communication styles, such as co-operative learning and holistic approaches; and have oral contributions recognised for both learning and assessment purposes*.' (reporting modes) Science

77 Ministry of Education interview, January 2002.

78 For example: `*Arts education must embrace these diverse traditions and the heritage of the* ***tangata whenua****, respecting and responding to the many ways in which students experience and express their own sense of identity.'* Arts `*Students should have learning opportunities to develop knowledge and understanding of the significance of cultural practices in physical activity, including physical activities characteristic of Maori and other ethnic groups'.* Health and Physical Education Statement page 43

79 Over 90% of students who have Internet access in Australia, Canada, the USA and Sweden report using the World Wide Web to complete their school assignments. Nearly 75% of Swedish and Canadian students reported using the Internet at school, roughly equivalent to the level of home Internet access. This compares with around 25% using the Internet at school in Italy, Japan, France and Germany. These figures disguise differences between individual or categories of students.

80 This section relates to the *bicultural dimension* of NZ education, i.e. the representation of Maori culture and values in the curriculum. The extent to which the Statements support differentiation, to make curricula accessible and meaningful to Maori students, is addressed *in 3.8.3 above*.

81 Unlike the other learning areas, Science does not include a glossary of specialist science terminology. However, this *is* provided in the support materials referred to in 3.6 above.

82 For example: `*... develop health education and physical education concepts within Maori and other cultural contexts that are relevant to students, for example,* ***in the context of te reo kori*** *(the language of movement) learning about the traditions, or values, and heritages of their own and other cultural groups, including those of the tangata whenua'* (Health and Physical Education, page 47)

83 Health and Physical Education Level 5 `*Students will investigate and described the ways in which people define their own identity and self worth amongst others, by discussing sexual attractiveness and orientation*.' Health and Physical Education

84 For example: `*As their understanding of ecological relationships develops, ...[by studying] examples from other areas of New Zealand and beyond ... . students will become aware of NZ's place in the global environment and sensitive to the vulnerability of the biosphere.'* Science Statement, page 53.

85 http://timss.bc.edu/

86 http://www.oecd.org/oecd/pages/home/displaygeneral/0,3380,EN-document-4-nodirectorate-no-12-22675-4,FF.html

87 www.inca.org.uk

88 www.eurydice.org

89 See Vygotsky, Dewey, Elley.

90 For example, France, Japan, Korea, Singapore.

91 For example, England from 2000, the Netherlands, Spain

92 For example, in Australia (non-statutory), Canada (Ontario,) England, the Netherlands, the USA (graduation requirements).

93 As expressed in *Sharpening the Focus* Issue 3.

94 For example, Australia, Hungary, Italy, Sweden.

95 Graduation requirements, in terms of subjects and community service, are determined at district or state level, but courses are assessed internally by each school. Only Advanced Placement courses, taken by some 7 per cent of students, are externally assessed.

96 For example, France offers a range of academic, technical or vocational routes to the *Baccalauréat*; Italian students transfer to upper secondary schools specialising in the humanities, Sciences, fine Arts or technical subjects; Sweden has 17 learning programmes at upper secondary, and the Netherlands offers four broad tracks in preparation for higher vocational or university education.

97 See SHARP, C. and LE MÉTAIS, J. (2000). *The Arts, Creativity and Cultural Education: an International Perspective.* Online at: www.inca.org.uk/thematic.asp

98 There is not much evidence of collaboration in secondary schools. Ministry of Education interview, 2001

99 For example: Smoking and diet (Health and Physical Education); History of scientific developments (Social studies); L4 pie charts (mathematics); L4 Maori foods (Technology); L6 and L7 HIV/Aids (Health and Physical Education); L6 clothing for specific purposes (Technology); L8 food preservation (Health and Physical Education).

100 See http://www.ccea.org.uk/pdf/01currev.pdf.pdf and

101 The challenge of measuring personal fulfilment, creativity, self-confidence and innovation is faced by systems worldwide. See, for example:

http://www.doe.tased.edu.au/learningtogether/success.htm

102 For example, Specialist Schools and Beacon Schools initiatives.

103 In England, although the law proscribed the allocation of time per subject, assumptions made about the time to be allocated to the subjects which were treated first (especially English, mathematics and Science) meant that there remained little time in the school day for the Arts, music and physical education, whose curricular requirements were developed later..

104 Elley (1996) argues that learning is not linear (irregular spurts, sidetracks, inconsistencies and misconceptions) and suggest that outcomes-driven instruction is less effective than interest-driven instruction.

105 See for example, Young Loveridge 1993 evidence that children follow a preordained sequence of learning in mathematics.

106 Reactions to the TIMMS results show an interesting divergence. Whilst the Anglophone countries sought to improve on their relatively poorer performance in the basic skills, Korea, Japan, Singapore identified a need for employees with higher order skills such as problem solving, critical thinking and creativity, and are reforming their curricula accordingly.

107 For example, schemes of work http://www.standards.dfee.gov.uk/schemes/

108 `*fluency with basic techniques is very important, but such routines only become useful tools when students can apply them to realistic problems.'* (Mathematics page 11) *All students must learn the conventions for English. Learning how to make their knowledge of language explicit provides a base from which they can make informed and conscious choices of language*. (English)

109 `*Students learn best about language as they use it in authentic context. Teachers should build on students' own knowledge to help to make explicit their understandings about language*.' (English ) `*Outside experiences enhance, reinforce, and clarify classroom learning.'* (Technology, page 17).

110 `*It is important that students are giving explicit opportunities to relate their new learning to knowledge and skills which they have developed in the past. Factors such as out of school experience and language have profound effects on the way students learn mathematics.'* (Mathematics**,** page 12)

111 For example, experiment/create (the Arts, Technology) observe, investigate (Science), `*active participation in mathematical situations, rather than through passive acceptance and repetition of knowledge*.' (Mathematics Page 18)

112 *In the senior secondary school, students can also explore language by comparing English with another language, such as Maori, or any other language spoken or taught in school or community. (English)* and by *linking or comparing [a given] text's of view of the world with their own*. (English) use a comparative approach *(Social Studies)*

113 Creativity as a major contributor to innovation, invention and scientific discovery, can be developed by encouraging students to look for problems as well as solving them, creating and producing as well as reproducing what already exists. *(Mathematics)*

114 *All students should experience the satisfaction of developing a range of outcomes* (Technology)

115 For example, encouraging students to critically examine the language of a chosen sport (in different context, such as biography, television commentary, or report) in English.

116 Students design an original board game; invent a tool for producing right angles for use by a clothing manufacturer, draftsperson or builder; through a process of conjecture and justification, find minimum sets of conditions for...; investigate and report on games of strategy

117 For example: share (the Arts), discuss, report in a range of genres, media and to different audiences (English), discuss and communicate; reporting in a range of genres, forms, media, and to a range of audiences, including younger students (p 123) (Science)

118 For example, the US textbook prescribing states determine what is published and thus what is taught in other States.

119 For example, the assumed desirability of co-education may not be shared by Muslim parents, who may feel uncomfortable about having their daughters educated alongside boys.

120 `... *cultural practices are always changing and ... contemporary cultures are in continual state of development'* Arts Statement

121 O'DONNELL*et al* (2000).

122 LE MÉTAIS, *et al* (2000).

123 LE MÉTAIS *et al* (2001)

124 LE MÉTAIS. (2000)

125 LE METAIS (*forthcoming*)