Changing school subjects for changing times

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Introduction

This paper critiques the conservative nature of many current school subjects. It asks in what ways we might expect traditional subjects to change within the broad scope of the rapid social change that inheres in what has been dubbed the "knowledge society". In this paper we use the term knowledge society to stand for the range of near synonyms in the various papers cited – for example information economy, information age, information society, knowledge economy, knowledge-intensive era. We have chosen to ignore the semantics of differences in their meanings so that our main argument is not made unnecessarily obtuse.

The analysis of the nature of current subjects has been drawn from the second year of the NZCER research project *Learning Curves: Meeting students' learning needs in an evolving qualifications regime.* This is a three-year project in which NZCER researchers are working with six medium-sized New Zealand secondary schools to document the subject choices offered to students in the senior secondary school, and to describe any changes in these as the NCEA is progressively implemented. The research project includes five curriculum areas: English, mathematics, science, the arts, and technology. It began in 2002 and further fieldwork is scheduled for Term 2 2004. The full reports of the first and second years (Hipkins and Vaughan, 2002; Hipkins, Vaughan, Beals, and Ferral, 2004) are available to download from www.nzcer.org.nz.

Trends in curriculum critique from a "knowledge society" perspective

Try typing combinations of the phrases "knowledge economy", "knowledge society", "school curriculum", or "school subjects" into an Internet search engine such as Google and it quickly becomes apparent that rhetoric about the shift to an information-based society abounds in high-level policy statements. This pertains in New Zealand and elsewhere throughout the world. Such statements typically include rather

general and sweeping calls to widen the scope of curriculum to include new types of skills while maintaining a "sound base" of traditional knowledge. The following quotes are illustrative of their general tenor:

> The students of the future will come of age in a world in which they will be increasingly likely to employ themselves rather than be employed by others. It is likely that they will have several careers rather than one job for life. It is imperative that our education system, at all levels, is focused on developing the whole person. We need people who are able to take their education and make their lives out of it, confident that they have a sound foundation on which to build their future; people who are agents of change rather than its victims. (SIAC, 2002, p. 39. Final report of the Science and Innovation Advisory Group: www.siac.govt.nz.)

> The compulsory education system must equip every New Zealander with the skills and knowledge necessary to live a prosperous life with dignity in the technologically enhanced lifestyle of a Knowledge Society. To prosper they need to be innovative and entrepreneurial in outlook, and take responsibility for re-educating themselves to use the benefits of technology. The achievement of dignity involves an understanding of the inter-relationships of technology, society and the environment to promote harmony with others and avoid the development of underclasses in New Zealand society. (IPENZ, 2001. Policy statement from the Institute of Professional Engineers of New Zealand: www.ipenz.org.nz.)

> In the 20th century the education system was too often a one-size-fits-all structure. It neither demanded nor provided excellent standards in education for everyone. Nor did the education system adequately target the needs of the individual pupil. In the 21st century, to be prosperous, the economy will depend heavily on the creativity and skills of its people. In a knowledge economy it is vital that we tap the potential of every one of our citizens. So what young people need from our education system is changing rapidly. We must build a flexible system around the needs and aspirations of individual pupils. (DfES, 2002. Green paper from UK Department for Education and Skills, www.dfes.gov.uk.)

A difficulty with such general statements is that they are likely to be read differently by different people and groups. As education researchers have recently documented, teachers in the same school can use seemingly quite specific educational terms while "talking past" each other. As long as suggestions remain broad and untested in shared practice, everyone is happy that their own meaning is a shared meaning (Grossman, Wineburg, and Woolworth, 2001).

Another difficulty is that these types of policy statements don't usually critically engage with what is *within* each of the traditional subjects that remain at the heart of the school curriculum. As long as a broad balance of actual subjects is maintained while the variously advocated new skills or subjects are brought into play, it appears to be assumed that all will be well. That this is not so becomes more evident when the critique originates from those who have expertise within specific curriculum subject areas. The difference in focus is illustrated here with the words of an American Emeritus Professor of science education:

> To *reinvent* science curricula we must recognize that the nation is moving into a learning society and a knowledge-intensive era. This move has made 'learning to learn' a goal for all school subjects. For the sciences this indicates a focus on the *new interpretation* of what is meant by scientific literacy. The *view now seen* is one of developing higher level thinking skills, such as decisionmaking, forming judgments and resolving problems. Each of these skills depends on acquiring a variety of cognitive strategies; for example, recognizing risks, ethics, values, and the adequacy of appropriate information.

> This *shift in emphasis* is from scientific inquiry to the optimal utilization of science knowledge in human affairs, including social and economic progress (Hurd, 1997, emphasis added).

While still open to varying interpretations, the challenge that this is not curriculum-as-usual is more apparent, as signalled by the phrases in italics. But traditional school subjects are an entrenched part of almost every school timetable. We experienced them as learners ourselves, as did the parents of today's students and all the education lobbyists of one conviction or another. While their content and pedagogies are historical products of their overall positioning within the march of Western society over the past century and a half, hidden layers of purpose and meaning have become so deeply embedded as to be practically invisible. This makes it very hard to compare "what is" with "what might be".

In her keynote address on the first afternoon of this conference, Jane Gilbert compared industrial age understandings of knowledge and of schooling with the new understandings of the knowledge society. Only when the two are directly compared can we begin to see why change within subjects is at least as important as any addition of new subjects/skills to the school curriculum. A direct comparison of the attitudes and abilities valued by society in the two eras shows the extent of the challenges for traditional subjects and teaching. The 12 values shown in Table 1 are those that one American teacher educator has recently called the "hidden curriculum" of schooling (www.coe.ilstu.edu/rpriegle/wwwdocs/hidden.htm). While some of these values relate more to the world of work, it is those that relate directly to schooling which will be discussed in what follows.

Table 1 **Values that an "information economy" demands**

Value	Industrial age	Information age
Self-reliance	On-the–job skills training complements education in the "3Rs"	Need ability to independently analyse and acquire skills required for job
Initiative	Management decides, workers follow directions	Minimal direct supervision – workers need to act independently
Logic	Mindless task repetition a feature of manual work	Machines do repetitive work, workers make decisions
Precision	Some imprecision a feature of work done by both humans and machines	Computer driven tools and machines much less forgiving of imprecision
Speed	Stable knowledge base of learning predetermined by experts	Rapid growth of knowledge base – need ability to sift large amounts of information
Learning	Learning took place at school – clear school/work division	Lifelong learning a necessity
Imagination	Curriculum based on memorisation, followed by standard operating procedures at work	Anticipation or creation of consumer demand expected
Humility	Qualifications certified expertise into the future	Some knowledge rapidly outdated so essential always to recognise own limitations
Communication	Autonomous individuals who could survive on their own	No-one can know everything – networks and communication skills essential
Cleverness	Intelligence measured knowledge of facts	Identification and solving of problems is mark of cleverness
Vision	9–5 jobs with minimal engagement	Workers need to know corporate mission, scan rapidly changing horizon, envisage alternative futures
Creativity	Recitation and reproduction of knowledge	Creativity and innovation essential in fast moving markets

After Riegle (2004).

The table identifies a range of important changes. This paper will argue that these changes have profound and challenging implications for the way we structure school learning through the subjects offered. But before these implications can be considered, we first need to reflect on the general nature of the subjects

that are currently offered. With this goal in mind, we now ask, what types of subjects can be identified in the senior secondary school, now, while we are still in the early stages of the NCEA qualifications regime?

An analysis of the nature of the subject

In 2003, NZCER researchers devised a method to analyse and compare options within core school subjects, and to further compare these with other traditional and newer types of school subjects. We collected course documentation for selected subjects offered in the six *Learning Curves* schools in 2003 – the second year of this research project. The analysis focused on the research instruments used for different versions of the courses. We collated details from published course/assessment plans for individual subjects to create comparative summaries such as those shown below.

This method of analysis assumes a strong relationship between assessment for qualifications and the actual teaching programme. While this assumption should certainly be kept under critical scrutiny, and we do not see such a relationship as inevitable, the course documentation we viewed did structure the year's learning around topics that were directly linked to specific assessment instruments (i.e. specific achievement or unit standards).

Year 11 (N = 912) and Year 12 (N = 620) students from the six schools completed a survey about their subject choices. The front page of the survey was customised to the actual options offered in each school, making it possible to gather data about numbers of students taking each type of course described.

Traditional-discipline courses

Tables 2 and 3 document the Year 11 mathematics and English courses offered to a majority of students across the six schools. On average, 67 percent of students were taking this type of mathematics course, although participation rates varied in the individual schools. Rather more – 86 percent of the overall Year 11 cohort – were taking this type of English course, again with varying participation rates across the schools.

Table 2 **Composition of the 2003 traditional-discipline Year 11 mathematics courses**

	Mathematics achievement standards offered									Unit standards offered
School	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**1.7**	**1.8**	**1.9**	
City School A 22 credits	✓	✓	✓	✓	✓		✓	✓	✓	
City School B 24 credits	✓	✓	✓	✓	✓	✓	✓	✓	✓	
City School C 24 credits	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Town School D 24 credits	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Town School E 26 L1, 3 L2, credits						✓		✓		Balance of course is equivalent unit standards
Town School F 24 credits	✓	✓	✓	✓	✓	✓	✓	✓	✓	

NB. Grey-shaded columns are internally assessed achievement standards.

Table 3 **Composition of the traditional-discipline Year 11 English courses**

School	English achievement standards offered									Unit standards offered
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	
City School A 21 credits	✓	✓	✓	✓	✓	✓		✓	✓	
City School B 23 credits	✓	✓	✓	✓	✓	✓	✓	✓		1 unit standard (wide reading)
City School C 23 credits	✓	✓	✓	✓	✓	✓	✓	✓		1 unit standard (wide reading)
Town School D 24 credits	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Town School E 24+ credits	✓		✓	✓	✓	✓		✓		5 unit standards
Town School F 27 credits	✓	✓	✓	✓	✓	✓	✓	✓	✓	1 unit standard (wide reading)

NB. Grey-shaded columns are internally assessed achievement standards.

The high degree of similarity between the assessment structures of these courses is very apparent. Very similar looking tables for Year 12 mathematics, Year 12 English, and Year 11 science can be found in the full report (Hipkins et al., 2004). Given sufficient resources and report space we could have documented similarly structured courses for the three most common Year 12 science subjects (biology, chemistry, physics) and for a number of arts and technology subjects at both year levels.

We have named such courses "traditional-discipline" courses. They have the following characteristics in common:

- They are entirely or largely assessed by achievement standards, not unit standards (except in some cases in Town School E).
- All or most of the subject-specific suite of achievement standards for the year level/subject are used to assess the course.
- When achievement standards are dropped they are likely to be internally assessed standards. As a result this type of course has a higher proportion of learning assessed by external examination.
- The curriculum offered tends to be organised around the divisions imposed by the separate standards (course outlines for the year tend to be summarised with reference to the standards that will be "covered" in each term).
- These divisions reflect traditional ways of thinking about the structure and content of each discipline within the school curriculum.

In the mid-twentieth century the sociologist Basil Bernstein called for serious theoretical and empirical study of the *structure* of educational knowledge. He devised a typology of subject types that could be used for such study (Bernstein, 1971). Within the scheme he devised, what we have called traditional-discipline courses would be seen as both "strongly classified" (that is, the boundaries between the individual disciplines are closely guarded and carefully maintained) and "strongly framed" (that is, the power to select, organise, and pace students' learning rests almost entirely with the teacher rather than with the students). Bernstein argued that school subjects that fit this profile socialise all students – including teachers when they were students – into a self-perpetuating subject loyalty. Thus our choice of the term "traditional-discipline" signals both a pragmatic characteristic (this is how schools have traditionally

organised these subjects) and a more philosophical characteristic (this is how knowledge has been traditionally organised and perpetuated in Western societies).

Locally-redesigned courses

The analysis documented two other types of courses, which we have named "locally-redesigned" and "contextually-focused" courses respectively. While the names seem cumbersome, it is our experience that names are very powerful. We wanted to avoid the binary differentiation typical of modern thought, by which non-traditional courses also become "not-academic" – a distinction we found unhelpful for our analysis.

In the core subjects, locally-redesigned courses were the least common type. In 2003 they were offered by all six *Learning Curves* schools for both Year 11 and Year 12 mathematics, but not English or science. The structure of the Year 12 mathematics courses is illustrated in Table 4. Details of the specific unit standards selected are documented in a separate table in the full report (Hipkins et al., 2004). They varied between schools.

Table 4 **Composition of locally-redesigned mathematics courses at Year 12 in 2003**

	Course components at level 1		**Course components at level 2**	
	Achievement standards	**Unit standards***	**Achievement standards**	**Unit standards**
City School A L1 credits	Students who could take such a course were completing the second year of a two-year level 1 locally-redesigned course			
City School B 6 L1, 13 L2 credits	1.1, 1.2		2.3, 2.4, 2.5, 2.6, 2.7	
City School C 16 L1, 5 L2 credits	1.4, 1.5	4 unit standards at this level		2 unit standards at this level
Town School D 10 L1, 12 L2 credits		4 unit standards	2.5, 2.6	3 unit standards
Town School E 15 L1, 12 L2 credits		7 unit standards at this level		5 unit standards at this level
Town School F 16 L1, 2 L2 credits	1.1	5 unit standards	2.7	

Locally-redesigned courses have the following characteristics:

- They are assessed by a mixture of achievement and unit standards (except in town School E which has continued to use unit standards as extensively as it did pre-NCEA).
- Teachers in the six schools have selected different mixes of standards. Choices are based on their past teaching experiences and their perceptions of students' continuing learning needs.
- At Year 12, some standards used to assess the course are set at NQF level 1 and some are set at NQF level 2.
- The curriculum usually continues to be organised around the assessment instruments used, but most courses "cover" less of the traditional curriculum content, allowing for some variation in pacing and limited introduction of broader contexts for learning.

These mathematics courses, while somewhat different in their details, remain traditional in their structure. The time-honoured divisions of mathematics into various "topics" are maintained, and indeed the courses

may be seen as stepping stones to help students move on to traditional-discipline courses at a later stage of their learning. However, they are not as strongly framed. They open up opportunities to vary pedagogical approaches by reducing content, varying curriculum levels, or, in the case of City School A, by spreading the course over a longer time span (two full years). To describe such courses as "academic" or (by implication) "not academic" is highly problematic, since they vary from more traditional courses in some respects but not in others.

Traditionally, Year 11 science has mixed the distinct disciplines (biology, chemistry, physics and, more recently and controversially, earth science, and astronomy) within one subject. Separate subjects for biology, chemistry, and physics are also available but are taken by a limited number of students. Traditionally, the separation into separate disciplines has taken place at Year 12 when most students begin to take separate discipline courses and integrated courses are less commonly offered, or indeed chosen. In Bernstein's terms, we could say that the work of fostering discipline loyalty is stepped up a notch as students near the end of their secondary schooling. However, the redevelopment of the Years 1–13 science curriculum in the early 1990s (Ministry of Education, 1993) opened up new opportunities for integrated science to be taught at Years 12 and 13. Against the background of this historical tension between integration and separation, new courses assessed by varying combinations of science and discipline-specific standards are now being designed in some schools (Hipkins and Neill, forthcoming). While science HODs in the six *Learning Curves* schools are cautiously experimenting with limited re-combinations of Year 11 achievement standards, their courses retain a traditional overall structure and so we have included them in the traditional-discipline group for now.

In this *Learning Curves* study, some examples of locally-redesigned courses were found in other curriculum areas. For example, home economics courses typically combine assessment via health achievement standards and selected food industry unit standards. In 2003, these types of courses were more popular with students than food technology courses assessed by only technology achievement standards. (Home economics was also the subject most often cited by Year 11 students as one they would like to take but could not.) City School B was exploring the possibility of offering a mathematics/music course at Year 13 in 2005. City School A offered a combined dance/drama course at Year 11.

Graphics and design is a popular subject that could be seen as having some locally-redesigned features (it blurs the boundary between arts and technology) and some contextually-focused features (many 2003 students at both Years 11 and 12 chose it with future careers in mind). However, this subject is also assessed with a full suite of its own achievement standards and at Year 12 was taken in the main by students who were studying traditional-discipline versions of both English and mathematics. This mix of features from across all three identified course types may well become more common in the future.

Contextually-focused courses

Building from a tradition of what were known as "applied" or "vocational" courses, all six *Learning Curves* schools offer English, mathematics, and science courses that differ from traditional-discipline or locally-redesigned courses in several key respects:

- Curriculum components are typically selected with links to the contexts of students' everyday lives, or their future potential employment and/or leisure, in mind.

- Courses offer a reduced number of credits, creating more flexibility and freedom for different types of learning experiences and varied pacing of learning.
- Reflecting an emphasis on skills and "doing", rather than the recall of decontextualised knowledge, assessment of learning is exclusively or predominantly internally managed – students seldom sit national examinations.
- The division of the curriculum into topics may or may not reflect traditional partitioning of knowledge.
- Assessment is currently mainly by unit standards rather than achievement standards.

In Bernstein's terms, such courses are weakly framed. When determining pedagogy, the perceived learning needs of the students take precedence over the traditional curriculum emphasis on subject initiation and the development of loyalty to subject traditions. For example, in 2003 Town School E offered one group of students a Year 11 science option with a focus on achieving the core generic unit standards for a level 1 National Certificate in Employment Skills (NCES). To this end the science course "contributed" a quarter of the year's learning time to the teaching of interpersonal communication skills.[1] The necessary pedagogical flexibility was gained by maintaining control of the content of assessments for qualifications within the school. Nevertheless, many such courses currently maintain strong traditional subject boundaries.

Table 5 **Contextually-focused Year 11 courses in English**

School	Achievement stds. offered					Unit standards offered
	1.1	1.4	1.5	1.7	1.8	
City School A , 11 Credits		✓	✓			2 unit standards
City School B, 9 credits						2 unit standards
City School C, 10+ credits				✓	✓	1 unit standard NZ Certificate in English
Town School D, 8 L1, 4 L2 credits	✓					4 unit standards – one at level 2
Town School E, 18 credits						5 English unit standards 1 core generic standard
Town School F, 20 credits				✓		6 unit standards

Contextually-focused courses in technology have replaced craft-based courses such as "woodwork" and "sewing". Schools are planning more such courses to counter what they see as the "intellectualisation" of technology subjects. For example, Town School F was planning to introduce two new Year 12 subjects in 2004 – Craft and Technology, Industrial Pathways – both for "trade-minded" students (usually boys) who had already done Year 11 design technology and didn't want to repeat it at Year 12 or Year 13. These were planned to function as transition subjects, with a certain amount of the learning focus dedicated to numeracy and literacy.

[1] In the full research report we described this as a locally-redesigned course because of the blurring of discipline boundaries while noting that many of its features were more akin to contextually-focused courses.

Rethinking "intellectualisation"

Having described the nature of three types of courses that are currently offered in our *Learning Curves* schools, we move now to more speculative ground. Our aim is to prompt discussion of potential directions for changes within the subjects currently offered to different groups of students. Here the first and second parts of the paper come together to tentatively explore the manner in which what is offered might better meet the projected learning needs of tomorrow's students. We begin this discussion by attempting to unsettle negative connotations that are typically associated with the term "intellectualisation" – for example, that it makes practical subjects too hard for certain types of students (Chamberlain, 2003; Hipkins and Vaughan, 2002).

The issue of "intellectualisation" of contextually-focused courses is not straightforward. Locally-redesigned and contextually-focused courses open up the potential to create new subjects with new combinations of knowledge and skills that more closely match those identified in "knowledge society" discussions about what will be needed for the future. Perhaps the most useful features of all three types of courses can be combined to create new kinds of "intellectualisation". But what might these look like?

Firstly, the type of knowledge that underpins curriculum will need to undergo careful scrutiny. Currently, students in traditional-discipline courses are strongly initiated (to follow Bernstein's argument) into a culture of *existing* knowledge that is predominantly the archived and valued knowledge of Western scholars. It is often abstract and is typically generalised beyond local contexts. Students are expected to absorb this ready-made knowledge and to use it for cognitive tasks – at the very least recall, but preferably some level of application, critical thinking, or similar task. By contrast, students in contextually-focused courses are more likely to work with knowledge that is local, socially embedded, and linked to the contingencies of practical tasks at hand – at least some of the time. For these students "knowing" includes practical and aesthetic experiences that *could* contribute to developing the types of information-age values identified in Table 1.

If these values are to be realised, knowledge does matter. As the term is currently used, "intellectualisation" implies that, for "vocational" students, practical action must be accompanied by more cognitive action than might have been expected of them in the past. To think autonomously it is necessary to have a stock of ideas to think with. To think creatively it is necessary to have access to a range of types of ideas that can potentially be recombined in new ways. (Here the limitations posed by the near-exclusive valuing Western thought in the school curriculum can be highlighted.) To think practically it is necessary to be able to visualise consequences, as well as a sequence of action. Whatever modes of thought are employed, the "knowing" must be able to be made one's own yet also be able to stand up to the limitations posed by the realities of human existence.

Arguably, these very same points, taken from a different starting position, could be made when discussing the learning needs of the great majority of "academic" students. How many able students are willing and able to spontaneously link decontexualised knowledge to a range of contexts to make the knowledge their own? Some researchers in the Deweyan tradition call this *transformative* learning and suggest that it is a rare outcome of conventional lessons (Girod and Wong, 2002; Pugh, 2002). How many able students are willing and able to creatively link knowledge across different curriculum areas? Research on transfer of learning suggests that only those with an existing broad and eclectic knowledge base, and a strong

motivation to do the necessary intellectual work, will add this sort of value to the traditional learning they already experience (Haskell, 2001). Yet transfer of learning is central to most of the values portrayed in Table 1.

What percentage of our most able students actually do this type of intellectual work at present? Could courses change in ways that encourage them to do even more? And what of the other students in "academic" courses – arguably a majority of students in our secondary schools? What might increased "intellectualisation" mean for them?

What we are struggling to make clear here is that we want to see subjects that follow a "both/and" pathway rather than the "either/or" binary that pertains today. Subjects need to be both practical and academic. It seems to us that locally-redesigned courses offer interesting prospects for achieving the necessary balance. New types of courses within and between traditional subjects need to allow students access to the most important knowledge and wisdom of others but also to support them to create new ways of knowing. Learning needs to be grounded in the best of historical knowledge but not straight-jacketed by its limitations and subject divisions. New subjects need to make space for local knowledges and multiple viewpoints while offering students opportunities to work with these ideas.

Some teachers are already struggling within the vanguard of these shifts. For example, the technology HOD at one *Learning Curves* school commented that the emphasis on a people-product relationship cuts across the traditional view that difficult work equals academic (and high status) work, removed from the "real world", with the corollary that anything intimately connected with the real world is of a lower status and less demanding. For him, the focus on problem-solving with technical knowledge is designed to meet real life needs. However a major problem is that parents, teachers, and students do not really understand this:

> Where the old technical curriculum might have suggested making a storage box by following the plans, step by step, the new technology curriculum suggests designing and making a storage box to meet a need for somebody in the wider community. The first methodology is teacher-driven, prescriptive, and instructional; the second relies on the teacher facilitating an enquiry-based learning environment and approach to problem-solving (HOD, City School B) (Hipkins et al., 2004, p. 126).

This contrast between old and new in the technology curriculum brings our discussion full circle. We now ask how existing subjects in other curriculum areas could also begin to be changed, using the assessment instruments of the NCEA as one agent of that change.

Industrial age or information age – which values predominate?

The science educator Paul Hurd, quoted at the beginning of this article, identifies a shift in *emphasis* from the (process and products of) scientific inquiry to the "utilization of scientific knowledge in human affairs", with associated development of cognitive skills such as decision making, forming judgments and resolving problems. On the face of it, traditional-discipline Year 11 science courses cannot offer this type of emphasis. They are assessed by suites of achievement standards that continue to emphasise the products and processes of scientific inquiry. Ironically, the level 1 science achievement standard most likely to meet Hurd's criteria – AS 1.2, the science research standard – is also the one most likely to be dropped when teachers perceive that workload pressures need to be reduced (Hipkins and Neill, forthcoming; Hipkins et

al., 2004). Nor is science the only subject where this is the case. Across the curriculum, teachers told us they were not teaching research skills because others were doing so.

Lest it seems we are singling science out for unfair scrutiny, we note that recall and application of traditionally emphasised "content" knowledge appears to be a key feature of traditional-discipline courses in other subject areas, too. Teachers could justifiably protest that this is what they are required to teach since this is what the current achievement standards in many subjects emphasise.

We also need to repeat the caution that this line of argument does not mean that content doesn't matter. On the contrary, as we have already noted, knowledge of the central organising concepts of any discipline is a prerequisite for the transfer of knowledge to new contexts (Haskell, 2001). Without such transfer it would be impossible to exercise the skills and values emphasised in Table 1. But the identification of key discipline concepts and critical specific content to be included in curriculum requires conversations we may have just begun in the New Zealand Curriculum Project. Curriculum change takes time to be negotiated and mandated, and development of new types of achievement standards may not yet have even been contemplated.

In the meanwhile, rich possibilities already exist to shape courses with combinations of the best features from locally-redesigned and contextually-focused courses. The NCEA has provided the assessment flexibility, as the existence of these courses demonstrates. One potential constraint we identified in the *Learning Curves* research is the perception that credits gained from achievement standards are of more value than those gained from unit standards. We describe a range of factors that seem to have contributed to this perception (Hipkins et al., 2004). While it persists teachers may be reluctant to encourage a greater number of high achieving students to take courses that include some unit standards assessments. The perceived lack of "parity of esteem" for the two types of assessment instruments needs to be addressed if flexibility to create new and innovative courses is to be retained and expanded.

It may be that the students are ahead of the adults (teachers, parents, curriculum policy makers) in recognising the need for such courses. The full 2004 *Learning Curves* report (Hipkins et al., 2004) documents the increasing popularity of subjects in the arts and technology areas, notwithstanding tensions such as "intellectualisation" in technology and the lack of status afforded the arts in the school curriculum. For example, the choice of drama – one of the newest curriculum subjects – was linked by almost all the Year 11 students who chose it to expectations of interest, challenge, life skills, *and* future career. Such unanimity of responses to a range of choice factors was rare.

Upon completion of their recent systematic review of future-focused research on teaching and learning, a team of Massey University researchers concluded that:

> Most of the policy platforms, frameworks and research programmes reviewed have adopted a conventional approach towards envisioning the future, generally reflecting a lack of foresight and imagination, an absence of non-Western views, lack of critique of current trends, and an *unquestioning endorsement of the status quo* (Codd et al., 2002, p. ix, emphasis added).

As Bernstein noted more than thirty years ago, there is a strong impetus to protect the "academic" status quo in the curriculum. Our analysis of the traditional-discipline subjects has shown that this influence is alive and well within the NCEA regime. Some will find this reassuring. However, those who are interested in the implications of future trends research that we have briefly outlined above may wish to reflect on

some issues that seemed to us to act as constraints to the types of changes that are now achievable – at least in principle.

What we need is the will to rethink purposes and priorities for school learning. We are at a potential turning point. Will we head imaginatively, creatively, boldly, confidently into a "knowledge society" future? Or will conservative, traditional curriculum influences and power structures, along with familiar teaching practices and ways of organising school timetables, keep us trapped in nineteenth and twentieth century perspectives that so many curriculum commentators say have passed their "use-by" date?

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