Well I know I need English and Maths….

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Paper presented at *Pushing the Boundaries: An International Conference for the Careers Industry*, Wellington, 28 – 30 November 2002

Abstract
With the advent of New Zealand's NCEA reforms, subject choice is becoming more complex. In this paper we suggest that the notion that traditional subjects will be important 'just because' is no longer an adequate basis for sound subject choice decision-making. We report on students' opinions and beliefs about their Year 11 subject choices, collected during the initial stages of a 3-year longitudinal study. The research, *Learning Curves: Meeting Student Needs in an Evolving Qualifications Regime*, suggests interesting new challenges for careers advisers and other teachers. Such challenges include: being able to link within-subject variation to specific types of study/career goals; working with students to think beyond a simple instrumentalism in school learning/teaching and subject choice; and finding ways of becoming more influential in students' decision-making networks.

Section One: Introduction
In this first section of the paper we outline the research study that has informed this paper, and then briefly comment on the issues that will be explored. In the second section of the paper we outline selected findings from the first stage of the research. (The full report of this stage can be found at www.nzcer.org.nz). In the third section we outline emerging findings from the next phase of the research and briefly discuss these in relation to the findings reported in section two. Finally in the fourth section we explore some issues for careers advisers that arise out of this work.

For those of you new to New Zealand or its qualifications system, the *National Certificates in Educational Achievement (NCEA)* is part of the *National Qualifications Framework (NQF) reforms*, which are intended to provide a single framework of assessment for qualifications. Peddie (1998) lists the additional aims of the NQF initiative as being the creation of an open credit transfer system, the breaking of the academic/vocational divide, the removal of a "time-served" requirement that students spend a specified amount of time in gaining qualifications, the creation of an outcomes-based model, recognition of prior learning, the protection of teacher professionalism through encouraging teachers to rethink curriculum goals and assessment approaches in flexible ways, and a comprehensive quality control system.

Initial NQF (and NCEA) development was built around NZQA *unit standards* which are sets of competency- and performance-based elements, and can be grouped together in various ways to document a qualification at sub-degree level. Unit standards have come under fire from business interests and academic critics as being anti-excellence since students can only achieve a credit against a unit standard (set competency). In answer to these criticisms, the NQF has incorporated *achievement standards* for "conventional" school subjects. Achievement standards allow for a credit, merit, or excellence category of pass. Achievement standards were developed from national curriculum statements and have less specific performance criteria than unit standards. The later are more specific and were developed from a combination of national curriculum statements and the expectations of tertiary providers and industry (New Zealand Qualifications Authority 2001).

Outline of Learning Curves

Learning Curves is a three-year longitudinal study that NZCER is currently undertaking of student subject choice at Year 11 in the context of the introduction of the NCEA. The research is exploring how school practices reflect the intention of the national curriculum to provide "flexibility, enabling schools and teachers to design programmes which are appropriate to the learning needs of their students" (Ministry of Education 2001). The primary focus is on whether schools are assessing and reporting on a wider range of student abilities than they were prior to the introduction of the NCEA, and how school subject choice policies and practices change as a result of the NCEA implementation. However we are also interested in how students perceive and make their subject choices, and how the choices they do make compare with their teachers' and parents' expectations.

The six case study schools in the study are similar in size, with total roll numbers between 590 and 850 students, the average range for secondary school rolls nationally. However the six schools represent a diversity of student groups and contextual settings. Three are city schools and three are in rural towns or provincial centres. Four are co-educational, two are single sex. The socio-economic deciles[1] of the schools range from 2 to 8.

Initial visits to each school were carried out during March - April 2002. The principal and five Heads of Department were interviewed (HoDs of English, Mathematics, Science, Technology and the Arts curriculum areas). School timetable and subject choice policy and procedure information was collected. Via a written questionnaire, Year 11 students were surveyed about their decision-making and opinions on the subject choice options available to them. The report of the first stage of the research was released in October 2002 (Hipkins and Vaughan 2002). In the second part of the first year's data gathering, 80 student questionnaire respondents have been chosen from across the schools, and across a range of subject-type mixes, to further probe their subject choice experiences and opinions via individual telephone interviews. While some preliminary qualitative data have been included in this report, the main analysis of the interview data has yet to be carried out.

The issues explored in this paper

Our research has highlighted the differences between parents and teachers, between students and teachers, and possibly also between students and parents, when it comes to understanding the new National Qualifications Framework and specifically the NCEA.

When it comes to subject choices, students seem to make subject choices based on personal enjoyment (and some intrinsic value they find in the subject) but they also have vague and instrumental views. A simple emphasis on school as preparation for the world of work (instrumentalism) may limit students' vision in relation to their choices. However a simple emphasis on learning for learning's sake is also limited by its tendency to be translated into school policies and practices which emphasise 'academic' over 'vocational' learning. We believe that there are dangers in contrasting these two positions (academic and vocational) as an either/or dualism. This oversimplification, as it has been traditionally understood, may no longer be an appropriate model for understanding how students make subject choices (and how teachers might want them to) within the context of the new qualifications regime.

We have also found that students tend to get subject choice advice from parents or caregivers rather than their school. Schools therefore need to work with parents to help students with their choices. Where students are influenced by the school, a subject teacher rather than a careers advisor or dean is the most likely source of influence. Careers advisors and teachers

[1] In New Zealand, all schools are given a decile ranking to indicate the scope and depth of financial and social resources against which the school can draw. The rating is calculated on a number of factors including socio-economic status of enrolled students' families, parent occupations, student ethnicity and school geographical location. Ten is the most affluent and advantaged of schools; one is the least affluent and most disadvantaged.

need to think differently about students and their choices in order to work with parents and students here.

Section Two: Preliminary findings from the first stage of the research

School subjects offered

Already the research provides evidence of considerable variation between the six schools as they modify subject choice practices at Year 11. All six schools have used the NCEA changes to increase the number of alternatives they are now offering within compulsory subjects. Five schools offer three mathematics alternatives, all six offer two English alternatives, and five offer two or more science alternatives. They encourage students into the alternatives perceived to best meet their learning needs, with varying degrees of compulsion.

Some schools are also widening their *range* of subject courses in response to the NCEA changes. Numbers of available courses at Year 11 range from 22 to 32. Technology is the curriculum area that offers the widest range of courses. One school offers eleven different Year 11 courses under the technology umbrella. One of these, 'Creative Technology', combines elements of visual arts, design skills, computing skills, and technological processes, and is assessed by Web Design unit standards. In some schools new courses in the Arts curriculum area are now available or being considered, and these are beginning to prove very popular with students interested in, or already taking, Arts subjects. Innovative courses in the social sciences combine elements of several traditional subjects (geography, history, economics, and/or social studies). This diversity is summarised in Table One on the next page, with alternative types of courses listed in the far right column, as are vocationally oriented courses.

Achieving a balance in the selection of Year 11 courses that will engage students yet keep their educational options as open as possible is a dilemma that is being debated in all six schools. Ultimately, no matter how many courses are offered in total, combinations of choices are constrained by the way each school structures its timetable. All six schools make considerable efforts to ensure that students make choices appropriate to their individual needs, although many students seem not to be aware of these efforts. The changes to the Year 11 qualification (from School Certificate to the level one NCEA) do require students to make very strategic decisions about their learning pathways through the senior secondary school. How do they understand these challenges, and on what basis do they make their choices? The next section outlines our findings, then the following section explores some new questions that these findings have raised.

Table One: Diversity of subject choices

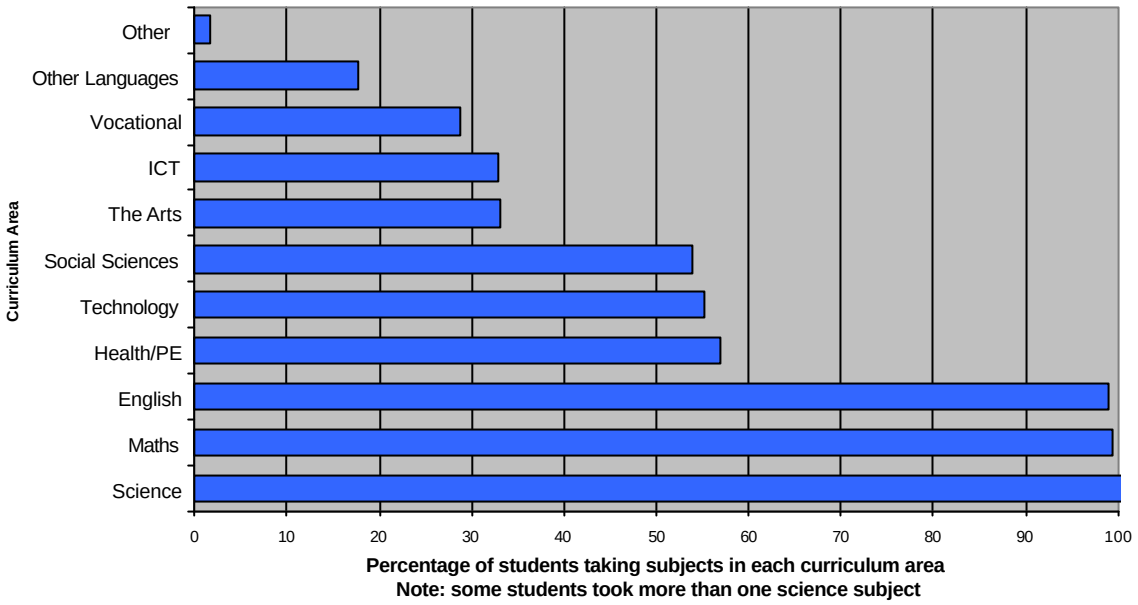
School data	Alternatives in 'core' subjects*		Option nos. in 'traditional' subjects		Option nos. in 'innovative' choices	
	Maths	3	Languages	5	Info Mgmt	1
City School A	English	2	Soc. sciences	3	ESOL	1
Roll number: 790	Science	2	Arts	3		
No. at Year 11: 168			Technology	4		
			Health/PE	1		
Overall Total: 25	Total	7	Total	16	Total	2
	Maths	2	Languages	3	Alternative	
City School B	English	2	Soc. sciences	2	technology	6
Roll number: 808	Science*	4	Arts	3	ESOL	1
No. at Year 11: 172			Technology	5	Career/work	
			Health/PE	1	focused	2
					Senior recreation	1
Overall Total: 32	Total	8	Total	14	Total	10
	Maths	3	Languages	4	ESOL	1
City School C	English	2	Soc. sciences	4	Transition	1
Roll number: 852	Science	1	Arts	2	Text Info Mgmt	1
No. at Year 11: 160			Technology	4		
			Health/PE	1		
			Accounting	1		
Overall Total: 25	Total	6	Total	16	Total	3
	Maths	3	Languages	3	Alternative	
Town School D	English	2	Soc. sciences	3	technology	3
Roll number: 825	Science*	4	Arts	4	Text Info Mgmt	1
No. at Year 11: 171			Technology	4	Careers focused	2
			Health/PE	1		
			Accounting	1		
Overall Total: 31	Total	9	Total	16	Total	6
	Maths	3	Languages	-	ESOL	1
Town School E	English	2	Soc. sciences	4		
Roll number: 956	Science*	3	Arts	3		
No. at Year 11: 184			Technology	4		
			Health/PE	2		
Overall Total: 22	Total	8	Total	13	Total	1
	Maths	3	Languages	2	PE/Life Skills	1
Town School F	English	2	Soc. sciences	5	Alternative	
Roll number: 590	Science*	3	Arts	3	technology	3
No. at Year 11: 141			Technology	4		
			Health/PE	-		
Overall Total: 26	Total	8	Total	14	Total	4

* includes horticulture as an option choice

Student thinking about subject choices

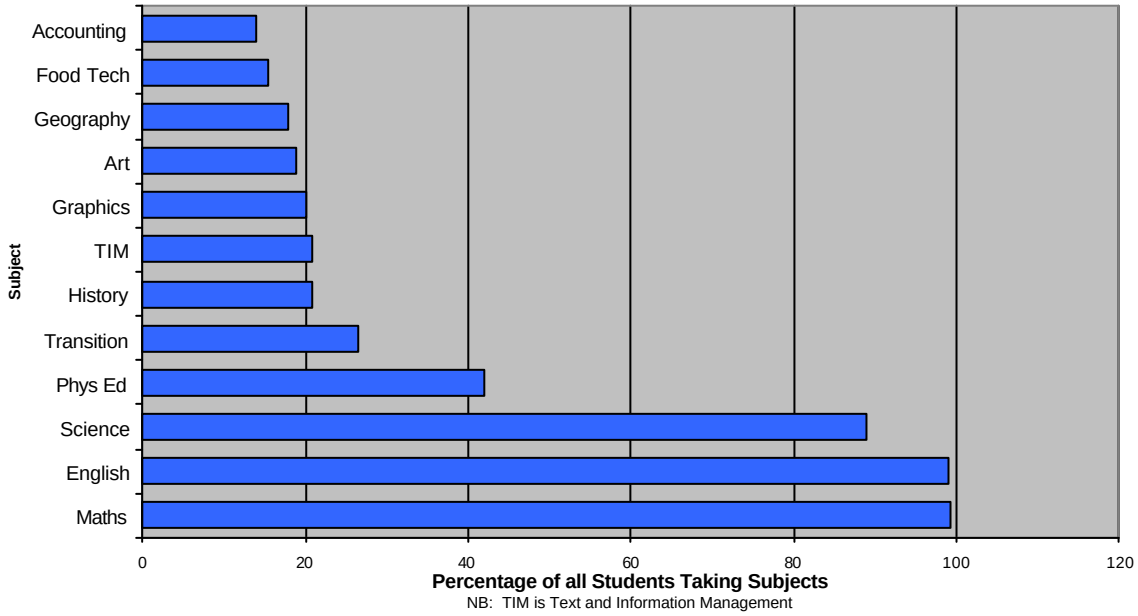
729 students responded to the student questionnaire, a response rate of 73%. As might be expected given their compulsory status (with the exception of science in one school) mathematics, English and science are the most commonly taken subjects, and also those in which students most commonly expressed a desire to improve. The spread of the subjects taken across the main curriculum areas is shown in Fig A.

Student Participation Across the Curriculum
(Figure A)



Reporting by curriculum area is misleading in some respects. Figure B separates actual subjects within curriculum areas to show the twelve most popular subjects across all six schools. In this analysis health disappears, reflecting the 'PE only' courses offered in five of the six schools. After the core subjects, Transition courses are the most popular, yet they are full option choices in just three of the schools. Similarly accounting makes the 'top twelve' despite being offered by only four of the six schools. The other popular optional subjects were offered in all six schools.

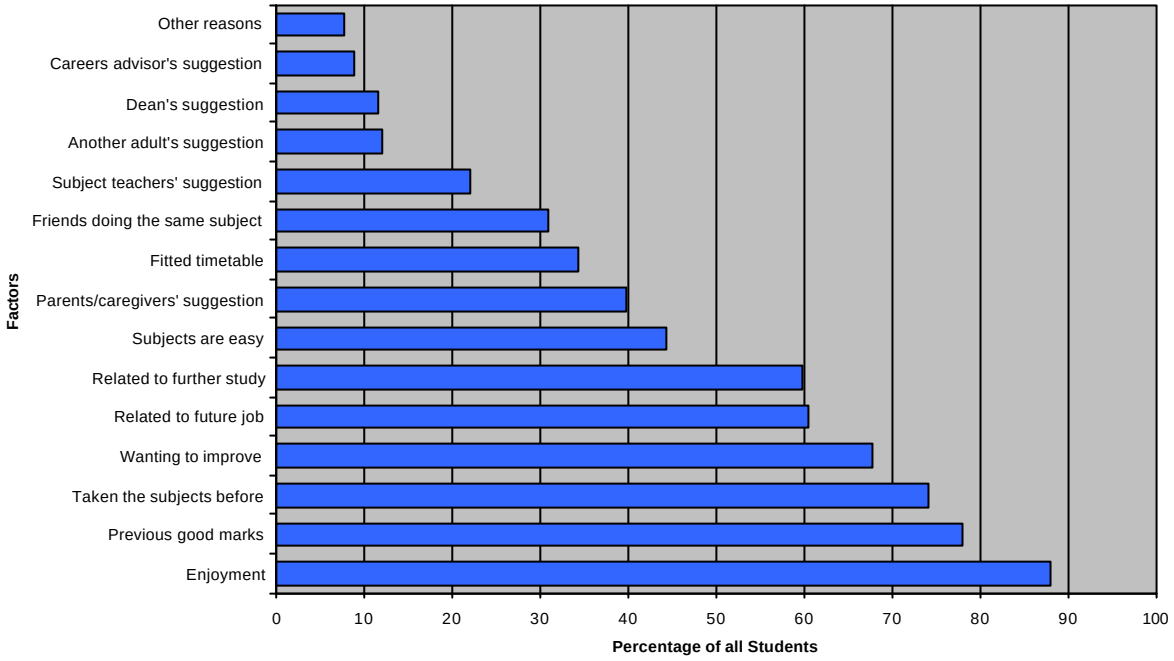
The Top 12 Subjects
(Figure B)



Linking school learning to future work and study

What motivates students to choose the subjects they do? Responses to this question indicate that personal enjoyment is a very important factor, something that has also been found in a large survey carried out in Brazil (Lannes, Rumjanek, Velloso and de Meis 2002).

Factors Influencing Student Subject Choice
(Figure C)



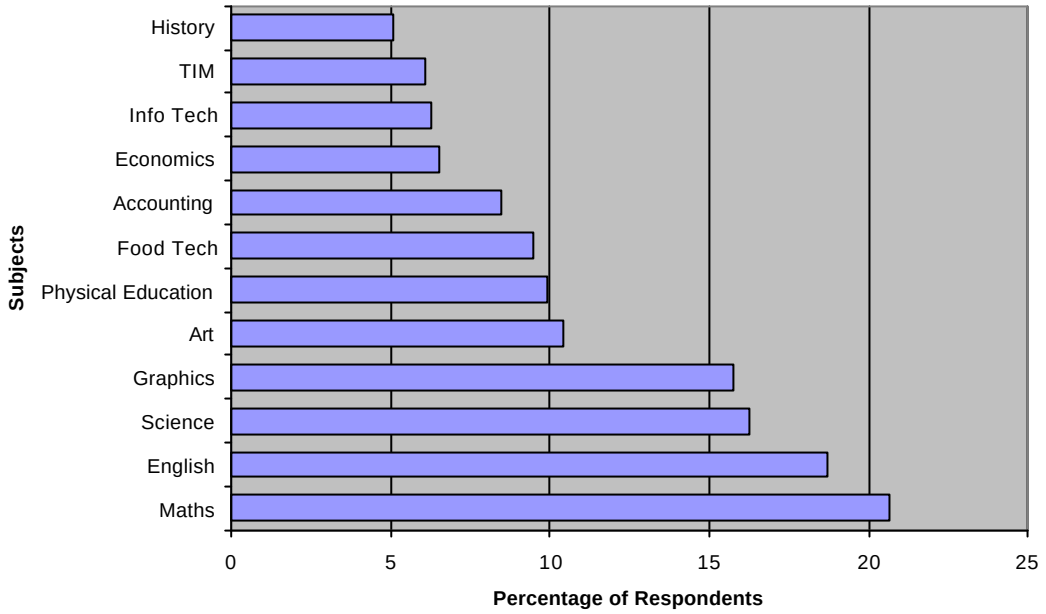
Arguably previous learning success, the next most influential factor, is also strongly linked to enjoyment. However our tentative thinking that personal enjoyment might also be positively correlated with the subject being perceived as easy was *not* borne out by the data. Our research did show a strong correlation between choice of PE as a subject and expectations that it will be 'easy'. However other subjects chosen for personal enjoyment were not linked to ease of learning in the same way. In fact, it seems quite possible that some of what students find enjoyable is the challenge or demands of their subjects.

Other research has linked enjoyment of learning to feelings of academic success that have been enabled for some previously under-achieving students by New Zealand's qualifications reforms (Boyd, McDowall and Cooper 2002), particularly where unit standards have been used for assessment of alternative learning pathways. Boyd et. al report students' learning success as the key that unlocks their potential and their increased awareness of tertiary study and career goals.

In a related project, Boyd, Chalmers and Kumekawa (2001) found that personal interest is a strong motivator of career decisions. If students do have career goals in mind when they make their subject choices, are they able to identify and at least broadly articulate the manner in which specific types of subjects will assist them in meeting those goals? This is an important question in view of the course variation, both within and between subjects, that is now beginning to open up.

However while students are very aware of the need to make choices that keep their learning options open (related to future study/job) they seem to be less clear about how individual subjects actually provide the basis for later learning, or for future careers.

Influence of Future Study on Subject Choice
(Figure D)



Reflecting their compulsory status in most instances, the core subjects are understood by many students in all six schools to be an important foundation for their future career choices. Most of the other subjects listed in this 'top twelve' (Figure D) have relatively direct links to possible future work. Exceptions are history, and possibly economics – although this can be a required entry-level subject for some tertiary business courses. Given these seemingly more prosaic links between optional subjects and future careers/study, we wondered just how students actually conceptualise the contribution that their core subjects will potentially make to their future learning and work. Strachan (2002) suggests that in the past a type of "magpie syndrome" has operated to support a belief in "the accumulation of qualifications for their own sake" (p.260).

We are seeking insights from this in the telephone interviews just completed, because responses to the student questionnaire suggest that 'personal enjoyment' could potentially be linked with or attributed to any of the following:

- Student self perceptions of academic or vocational ability
- Pathways conceptualised for further study or for future work
- Expectations of learning challenge (or conversely of relaxation and entertainment)
- Parental encouragement and reinforcement of self perceptions of ability (or not)
- Influence of individual teachers
- Subject specific content, contexts, learning activities
- Gender and/or cultural differences

Section Three: Preliminary insights from the telephone interview data

It would appear that, while they are now nearing the end of their Year 11 studies, most of our students still have only a very vague view of the importance of their core curriculum subjects. The following responses are indicative of this 'fuzzy' rationale:

- *I don't know – I just know that it's important (science)*
- *You need maths in life and in general*
- *You need English in any type of work*

Those students who can articulate specific beneficial outcomes from their core subjects tend to take an instrumental view of the benefits to be gained from their learning. In this type of view, mathematics is important for measuring, counting, calculating percentages, and estimating. English is important for communicating, talking, formal writing, and for reading and understanding instructions in the workplace. Reinforcing this type of thinking, reasons for *not* continuing with subjects again at year 12 also reflect a very instrumental view of the benefits to be gained from school education:

- *I want to become a primary school teacher and I don't think we'll be covering fifth form history at that level.*
- *I want to do psychology and the history I learnt was about the world*
- *Maths – algebra, trigonometry, number, measurement – I'm not really going to use triangles in my life.*
- *You'll only use French in translation or travel consultant and I am not interested in that area*
- *Life skills is about drugs and their uses and consequences – it would be useful if I was interested in becoming a doctor but I'm not. What I've learnt in life skills I won't need in my career as a designer or architect.*

With more than half of the telephone interviews completed when this paper was drafted, just three of the forty six interviewed students had given responses that indicated benefits that were not instrumental:

- *Writing and understanding of the language will help me with drama – understanding Shakespeare.*
- *Science teaches you to think.*
- *History – I'm into journalism and what I've learnt will be very useful.*

Most of the above responses suggest a very narrow view of the purposes and worth of school learning. It is too early to tell if this view really is pervasive in year 11 students at all six schools, or if their teachers have attempted to articulate any more insightful reasons for taking particular subjects. This issue does need careful consideration. Other research on school students, carried out by the Australian Council for Educational Research (ACER) found that intrinsically-motivated Year 12 secondary students – those who find the work interesting for its own sake – are more engaged than other, non-intrinsically-motivated students (Fullerton 2002: v). Although engagement rather than student subject choice was the focus of ACER's study, the findings are relevant here because engagement tends to lead to success at school. In turn that success is related to how students choose their subjects – often by having had "previous good marks" or by being directed by staff to take particular courses thought to correspond with the student's abilities (and interests).

However engagement itself is not an unproblematic concept. In a study of tertiary students and instrumentalism in their subject/course choices, Ditcher and Hunter (2001) make the point that students these days see the university experience as part of a bigger picture of "life". They comment that:

> …speaking of 'disengagement' comes from a deficit view of students; we prefer to think that today's students are showing different patterns of engagement compared to previous generations of students. What universities need to do is to find ways to adapt to these shifting patterns of engagement (Ditcher and Hunter 2001: 14).

Schools may face similar challenges to those of the university in Ditcher and Hunter's (2001) work. Specifically, these are challenges in needing to re-think instrumentalism and what learning means for students in terms of the school curriculum. It seems likely that the relationship between personal enjoyment and instrumentalism is not one where each will mutually exclude the other, but instead is a relationship where perhaps both are necessary in some form. In next year's data gathering round, we will follow up our emergent findings and further explore the complexities of the relationship between personal enjoyment and instrumentalism in student choices.

Section Four: Challenges for careers advisers

Do students get advice in a form they can understand or use from those who are able to help them make more informed subject choices? Here again, our data suggest real challenges for schools. In the view of most of the staff we interviewed, and as supported by the documentary evidence of their practices, all six schools went to considerable lengths to provide advice for students as they made their Year 11 subject choices. However the students themselves were decidedly 'lukewarm' about the advice provided and they reported being most inclined to discuss their choices with their parents. Sixty-one percent of student respondents thought that their parents were 'extremely' or 'very' interested in their subject choices. Only 6 percent perceived that their parents were 'not at all' or 'not very' interested in their subject choices. The remaining 33 percent thought their parents were 'fairly' interested.

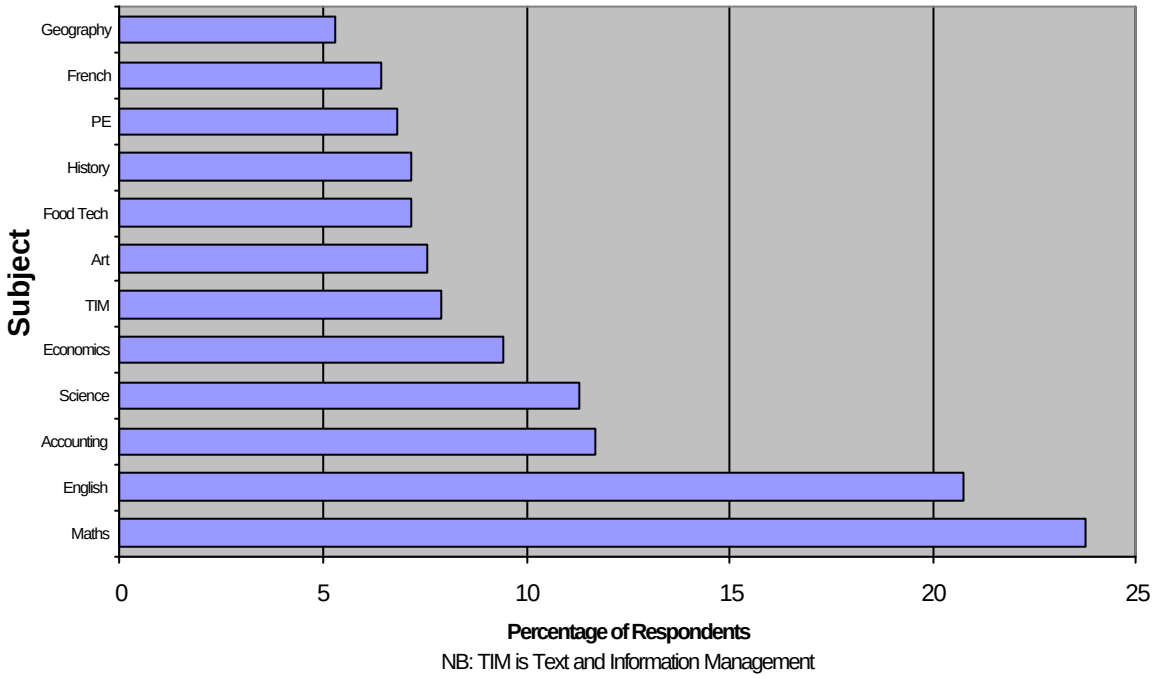
A similar pattern of high parental influence in comparison with school staff influence has been found in the *Beyond School* project (Boyd, et al. 2001), which tracked the intentions and actual outcomes of transition for 321 secondary school students from five different secondary schools. In that study the influence of family members and relatives stood out as the information source most used. As Fitzsimons (1997) pointed out in an earlier NZCER study of the influence of the National Qualifications Framework (NQF) on students and their choices, information alone is not enough. Decision-making about the future, careers choices, and further study are context-dependent and linked to/formed by family background (including family knowledge and discussion), the media, and school culture. That situation suggests that students do make sense of the NQF in relation to their future opportunities, perhaps with the help of their parents and, to a lesser extent, careers advisors or teachers in their school. But students do this in particular ways – in this case, what look to be fairly instrumental ways.

Do the instrumental views for making their subject choices, that we appear to be seeing in the majority of the year 11 students we have interviewed so far, actually reflect conservative views of curriculum and schooling held by parents? They might if we focus on the high level of student-reported parental interest in their subject choices, and student rankings of their parents as the biggest influence on their subject choices. However there is also a strong possibility that teachers too have conservative views of the curriculum and schooling. Those views are likely to be shaped by the day-to-day lived reality of school. The constraints of the timetable, requirements of the National Curriculum (content and delivery), and stretched resources and heavy workload in many schools, mean that teachers are more likely to be expedient when it comes to advising or encouraging students around subject choice. The path of least resistance may well be the instrumental view of what a student does or doesn't seem to "need" for a particular career. The structural bounds of schooling may mean that a teacher-driven instrumentalism in helping students think about subject choice may exist in tension with a teacher's best intentions to encourage students to value learning and subject choices in more intrinsic, less instrumental, ways.

There are also issues over the gulf between teacher, student, and parent understanding about how the new qualifications regime actually works, and what its implications are for a student and their subject choices. Our interviews with the HODs and principals revealed tensions in cases where parents were thought to not yet understand the full import of the changes to the national assessment-for-qualifications regime. These parents tended to cling to not only the perceived prestige of the School Certificate in name, but also to the notion of a norm-referenced pass/fail system. Tensions arise when parents are anxious that their children continue with the 'school certificate' equivalent of the core subjects, when school staff believe they would gain more benefit from an alternative course that can, in any case, now lead to qualifications credits.

It would appear from our study that parental interest is primarily directed at the core subjects, followed by a number of the more directly career-related subjects – accounting, economics, and text and information management (TIM).

Subject Choice Influenced by Parents
(Figure E)



NB: TIM is Text and Information Management

Art also featured, possibly reflecting student career aspirations in this area. Two of the schools in the study were located in communities strong in the arts and the art world has also received considerable publicity in recent years. Art has a relationship (though not a simple one) with graphics. The popularity of graphics as a subject that is seen to have strong career prospects (Figure D) may reflect the growing influence of, and interest in, a confluence of popular culture, media, design, and technology.

There is a further aspect to this challenge of helping parents to help their children make good choices. While subjects may remain the *same in name* across many years of school curriculum tradition, they typically change dynamically from within. What parents think of when they envisage a specific subject from their own schooling may well be very different from what the school now offers. In a thoughtful analysis of relationships between school knowledge and students' 'owned' everyday knowledge, one educator identifies this hidden change as a challenge to traditional thinking about what a subject actually 'is':

> ..mathematics may remain on the timetable, but what is taught as high-status mathematics has come in a wide variety of guises in the last 30 years. The collection of facts and procedures that are empirically found to be legitimated by the school system is far from static, and the tendency of commentators to treat the currently valued areas automatically as this society's version of school knowledge is somewhat puzzling (Paechter 1998, p.166).

We found evidence of such change within several 'subjects' in one of our case study schools. In this school, the 'alternative' science option included generic skills such as measurement and safety in the workplace, while one of the English options included keyboarding, and one of the mathematics options included problem solving, employment rights and responsibilities, and planning for the future. With appropriate combinations of unit and achievement standards, all three courses carried qualifications credits, although not as many as their more 'academic' counterparts. These were clearly not the 'high status' versions of their subjects to which Paechter refers above. But it is early days in the NCEA change. Where 'alternatives' lead, 'academic' subjects may follow. As the relevant records become available, we intend to track the variations in each traditional curriculum 'subject' in all six of our schools. The mere possibility of divergence (which can now be achieved by mixing and matching unit and achievement standards) serves to highlight the complexity of the challenges that schools face as they try to find ways to 'future proof' students in the subject choices that they make.

Conclusion

If subsequent stages of the research confirm our preliminary findings, there are some real challenges for careers advisers and deans. The challenges include questions about who are the best people, or best kind of careers advisors, to be working with students. The Gateway project has already shown that people with industry backgrounds can be successful advisors of students when it comes to helping design individual learning programmes for students (Skill New Zealand 2002). For whoever works with students here, it will also mean working with their parents, if changes are to occur in outlook about the role of learning, forms and purposes of assessment, and the wider benefits to be gained from school. Working with students and parents also means thinking differently about instrumentalism, and what it might mean in terms of subject choices, career choices, and life choices. This in turn is likely to mean that working with students also entails working with teachers, so that teachers too can help their students to think more broadly about the benefits to be gained from their learning in different subject areas.

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